CHAPTER 4—ENVIRONMENTAL CONSEQUENCES

This chapter objectively evaluates the environmental impacts of implementing each alternative described in Chapter 2. This chapter forms the analytic basis for the comparative summary of impacts presented in Section 2.6. Chapter 3 describes the existing conditions of the resource topics that would be affected by the alternatives. The organization of this chapter parallels that of Chapter 3; the same resource topics are presented in alphabetical order. Because resource topics are often interrelated, one section may refer to another.

4.1 INTRODUCTION

The purpose of this chapter is to determine the potential for significant impact of the "federal action" on the "human environment." The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) state that the "human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 Code of Federal Regulations [CFR] §1508.14). The "federal action" is the Bureau of Land Management's (BLM) selection of an alternative plan on which future land use actions would be based.

There are many BLM management actions that are common to all alternatives. Impacts that are common to all are discussed under the Impacts Common to All Alternatives section under each heading. Impacts of management actions that are the same for two or more alternatives or that vary by alternative are discussed under each resource heading. Some BLM management actions may affect only certain resources and alternatives. If an activity or action is not addressed in a given section, it is because no impacts are anticipated.

Compliance with applicable laws, regulations, and policies is a part of day-to-day business. A description of the authorities that apply to the selection and implementation of the management actions for the Resource Management Plan (RMP) is presented in Section 1.4. Such regulations deal with air quality, cultural resources, natural history resources, accessibility, hazardous materials, threatened and endangered (T&E) species, and water quality, for example. The effects discussed in the analysis are those that would result from implementation of management actions, not those that would result from compliance with laws, regulations, and policies.

Types of Impacts

Analysis of the alternatives focuses on identifying types of impacts and estimating their potential significance. Throughout this chapter, the terms "impact" and "effect" are synonymous. An overview of the types of impacts is presented below. Cumulative impacts are defined and discussed separately in Section 4.20.

Direct Impacts

These are effects caused by the action and occur at the time and place of the action. Examples include the elimination of original land use as a result of the erection of a structure.

Indirect Impacts

Indirect impacts are effects that are caused by the action but occur later in time or are farther removed in distance, but are still reasonably foreseeable and related to the action by a chain of cause and effect. Indirect impacts may reach beyond the natural and physical environment (e.g., environmental impact) to include growth-inducing effects and other effects related to induced changes to resource users (e.g., non-environmental impact).

Determination of Significance

Both direct and indirect impacts may be significant. "Significant" requires consideration of the context and intensity of the impact. This means that an action must be analyzed in several contexts—such as the immediate vicinity, affected interests, and locality. Both short-term and long-term effects are relevant. Intensity refers to the severity of the impact. Thus, significant impacts have intensity that must be considered negligible, minor, greater, or substantial.

Determining significance is complex. The significance of an impact is dynamic and thus 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, but not limited to, legal requirements, public perception, monitoring data, and professional judgment.

Specific significance criteria are presented for each resource topic. The criteria provide thresholds beyond which impacts would be considered significant. Each resource topic ends with a summary statement regarding significant effects.

Regions of Influence

Regions of influence (ROI) are the potential areas that an alternative may reasonably affect. ROIs can vary by resource topic. Limits of ROI may be natural features (such as a watershed), political boundaries (such as a county), or industry-accepted norms of the resource (such as used in one aspect of air quality).

The ROI for all resource topics includes all public lands and minerals administered by BLM within the Resource Management Plan Planning Area (RMPPA), as well as the following:

- The ROI for impacts concerning socioeconomics includes four counties in southern Wyoming: Albany, Carbon, Laramie, and a portion of Sweetwater.
- The ROI for impacts concerning air quality includes the nearby air quality sensitive areas, such as national parks and wilderness areas. In addition, a multi-state regional area was considered for haze issues. More details on the regional areas and the specific locations of areas outside of the RMPPA are found in the *Air Quality Technical Support Document* (AQTSD).
- The ROI for the cumulative impact assessment is presented in Section 4.20.

Methods and Assumptions

Impact analysis is a cause-and-effect process. In evaluating the context of an impact, an affected resource is compared to the available area or quantity of that resource. The analysis identified resources that would be altered based on management actions 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

based on the significance criteria. Additional information regarding specific methods of analysis is presented for each resource topic.

Environmental impacts associated with the 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 is based on the following assumptions:

- Short-term impacts are defined as those impacts that are anticipated to begin and end within the first 5 years after the action is implemented. Long-term impacts are defined as lasting beyond 5 years to the end of or beyond the 20-year planning time frame addressed in the RMP.
- This planning effort will recognize valid existing rights.
- Actions must comply with laws, executive orders, and regulations.
- Lands covered in the Environmental Impact Statement (EIS) for the planning effort include any/all lands that may affect or be affected by the management occurring on BLM-administered public lands in the RMPPA. However, the planning decisions in the RMP will apply only to BLM-administered public lands and federal mineral estate in the RMPPA.
- Planning decisions in the RMPPA also apply to BLM-administered federal minerals that underlie nonfederal lands (split estate).
- Within the RMPPA, there will be no RMP decisions made on nonfederal land surface or mineral estate, on federal lands administered by other federal agencies, or on the federal mineral estate underlying federal lands administered by other federal agencies.
- A collaborative and multi-jurisdictional approach will be used, where possible, to jointly determine the desired plant communities and management direction for the public lands.
- To the extent possible and within legal and regulatory parameters, BLM management and planning decisions will be consistent with the planning and management decisions of other agencies, state and local governments, and Indian tribes with jurisdictions intermingled with the RMPPA.
- Planning and management direction will focus on the relative values of resources and not exclusively on the greatest economic return or economic output.
- For the planning effort, current scientific information, research, and new technologies will be used.
- Reasonably foreseeable action or activity (RFA) scenarios for all land and resource uses (including minerals) will be developed and portrayed based on historical, existing, and projected levels for all programs.
- Existing endangered species recovery plans, including plans for reintroduction of endangered species and other species, will be considered. Consultation, coordination, and cooperation with the U.S. Fish and Wildlife Service (USFWS) will be in accordance with the 2000 BLM/USFWS Interagency Memorandum of Understanding (MOU) regarding Section 7 Consultation. All existing biological assessments and biological opinions regarding areas within the RMPPA will be reviewed for applicability.

- Restrictions or prohibitions will be placed on activities in specific areas to protect sensitive resources.
- Mitigation requirements exist 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 assess rangeland health and provide strategies to achieve resource conditions and management objectives.
- Projections of the level of activity for land uses are 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.
- Analysis will consider 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.
- Funding would be available to implement the alternatives described in Chapter 2.
- The Hazard Management and Resource Restoration Program (HMRRP) will manage the hazardous materials associated with all alternatives in the same general manner in accordance with laws, policies, and regulations. The objectives of the HMRRP are to protect public health, safety, and the environment on public lands; emphasize waste reduction for BLM-authorized and BLM-initiated actions; comply with applicable federal and state laws; prevent waste contamination from BLM-authorized actions; minimize federal exposure to the liabilities associated with hazardous materials management and waste management on public lands; and integrate pollution prevention, hazardous materials, waste management, and waste reduction policies and controls into all BLM programs. Details of the HMRRP program can be found in Appendix 32.
- The introduction of invasive invertebrates, vertebrates, microorganisms, and pathogens can threaten the stability of ecosystems, create serious human health consequences, and cause substantial economic burdens. Large majorities of native and non-native species do not pose a threat to natural or human systems. However, if any of these species becomes a concern, the Rawlins Field Office (RFO) would cooperate and coordinate with appropriate government agencies, private industry, and other interested parties involved in public education efforts and control, management, and research of invasive species.

Additional assumptions are presented in the Methods section under each resource topic.

BLM manages public lands for multiple uses in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA). Land use decisions are made that protect the resources while allowing for multiple-use 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 irreversible or irretrievable 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 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 of the alternatives. It is important to note that all management prescriptions for each resource and resource use directly or indirectly relate to each other; therefore, impacts of other prescriptions and guidance may apply to each resource management activity.

4.2 AIR QUALITY

This section presents the impacts on air quality from management actions of other resource programs. Existing conditions concerning air quality are described in Section 3.2.

Significance Criteria

If and when specific activities are proposed at the implementation stage requiring quantitative analysis, however, impacts to air quality would be compared to the following significance criteria:

- The National Ambient Air Quality Standards (NAAQS) or Wyoming Ambient Air Quality Standards (WAAQS)
- The applicable Prevention of Significant Deterioration (PSD) increments
- Federal guidelines for visibility impairment and atmospheric deposition.

More detailed information on the significance criteria is included in the AQTSD, Appendix 4.

Methods of Analysis

A qualitative emission comparison approach was selected for analysis of impacts on air quality. Quantitative analysis will be required for specific proposals as development projects are defined in the future. The Wyoming Department of Environmental Quality-Air Quality Division (WDEQ-AQD) will require demonstration of compliance with federal and state air quality regulations and standards for any future development projects. Given the uncertainties concerning the number, nature, and specific location of future emission sources and activities, the emission comparison approach provides a sound basis to compare the potential impacts under the various alternatives. A detailed list of all assumptions used in this impact assessment is presented in the AQTSD.

The emissions inventory was developed for the RMPPA using best available information concerning activities on BLM land provided by the RFO and summarized in the AQTSD. The calculations used emissions factors accepted and recognized by state and federal regulatory agencies. This analysis selected three different time frames to evaluated future emissions. The time frames reflect the current base year conditions, short-term impacts, and long-term impacts. It is assumed that all, if any, emission growth will be constant and linear in time.

The inventory time frames are as follows:

- Current emissions (using the year 2003 as a basis)
- Five-year potential emissions for the short term (2008)
- Twenty-year potential emissions for the long term (2023).

The base emissions reflect the year 2003, because the base year well data are for oil and gas wells on the ground ending October 31, 2003.

The analysis is based on the following assumptions:

- Emission factors recommended by the U.S. Environmental Protection Agency (EPA) (EPA 1995) are appropriate for all activities, except for those emission factors that have been lowered through WDEQ-AQD best available control technology (BACT) requirements.

- Activity factors (the quantification of activity for each resource provided by the RFO) are appropriate for the base year and future time frames.
- Any anticipated recreational growth would follow growth trends for Wyoming over the past 10 years.
- For the qualitative analysis, only emissions from RFO BLM-administered activities are included. For the cumulative analysis, emissions calculations are included for other federal and nonfederal permitted actions throughout the state.
- Criteria pollutants and hazardous air pollutants (HAP) are included in the calculations.
- Coal mining activity would be 1.2 million tons per year production, with the coal mining activity ceasing in 2004, and with coal mine lands reclamation continuing for the next 8 years, thereafter.
- No trona mining activity would occur on RFO BLM land.
- Prescribed and wildland fire emissions are estimated by Simple Approach Smoke Estimation Model (SASEM) (Sestak and Riebau 1988).

Emissions were calculated for the following activities: coalbed natural gas (CBNG) development, coal mining, lands and realty actions, livestock management activities, off-highway vehicle (OHV) use, resource roads, disposable mineral development, vegetation management (including prescribed fire), and conventional natural gas development. Activities related to cultural resources, paleontology, recreation, transportation and access, noxious and invasive weed control, wild horses, and wildlife and fish are assumed to produce minimal air pollutant emissions.

Figures 4-1–4-4 provide a summary of potential oil and gas wells for all the alternatives. These are the total numbers of wells that are projected to be operational at any given time. The calculations take into account new wells added minus old wells abandoned. All alternatives indicate projected growth in oil and gas development.

The emissions estimates found in Figures 4-5–4-20 present emission calculations for all alternatives. The base year calculations are also used to compare air quality impacts under other alternatives. As project-specific developments are proposed, quantitative air quality analysis would be conducted for project-specific assessments performed pursuant to NEPA.

Potential air emissions were identified for all resource programs. Additional detailed data concerning emissions are appended in the AQTSD, Appendix 4. The emissions from each of the individual resources are outlined below.

Figure 4-5 presents a summary of base year estimated emissions for actions occurring on lands administered by BLM within RMPPA. More detailed information on the emissions factors and calculations is appended in Appendix 4.

The AQTSD also includes the calculation methodology and specific reference sources used to develop emissions data. The total emissions were broken down for CBNG, conventional oil and gas, and other BLM activities for each alternative and for the 5- and 20-year time frames (Figures 4-9–4-20). As shown in Figures 4-9–4-16, growth in air emission is anticipated in the short and long term from oil and gas activities.

The increase in potential annual emissions over time for all ambient air constituents was calculated from the information presented in Figures 4-5–4-8 and is shown in Table 4-1 and Figures 4-21–4-24 for each

alternative. For Alternative 2, growth in particulate emissions from mineral material disposal is anticipated. For Alternative 3, increased prescribed fire activities would increase particulate matter. Again, calculation details are found in the AQTSD and in the emission tables.

Table 4-1. Increase in Annual Air Emissions from 2003 Conditions on BLM-Administered Lands Within the RMPPA[a]

Time Frame	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAP
Alternative 1							
2008	519 (28%)	135 (22%)	2,228 (69%)	29 (48%)	2,074 (101%)	4,831 (35%)	537 (38%)
2023	1,047 (57%)	397 (64%)	6,932 (214%)	64 (105%)	7,433 (361%)	7,109 (52%)	921 (64%)
Alternative 2							
2008	576 (31%)	151 (24%)	2,440 (76%)	33 (54%)	2,206 (107%)	5,369 (39%)	594 (42%)
2023	1,132 (61%)	429 (69%)	7,433 (230%)	69 (113%)	7,856 (381%)	8,848 (64%)	1,109 (78%)
Alternative 3							
2008	289 (16%)	73 (12%)	1,414 (44%)	13 (21%)	1,575 (76%)	1,953 (14%)	236 (17%)
2023	699 (38%)	275 (44%)	5,046 (156%)	40 (66%)	5,806 (282%)	2,775 (20%)	434 (30%)
Alternative 4							
2008	411 (22%)	109 (17%)	1,823 (56%)	19 (31%)	1,949 (95%)	4,596 (33%)	512 (36%)
2023	934 (50%)	368 (59%)	6,500 (201%)	53 (87%)	7,273 (353%)	6,585 (48%)	867 (61%)

[a] Constituents increase in tons per year and in percentage from base year emissions.

The State of Wyoming has the regulatory authority to require BACT. Impacts on visibility and atmospheric deposition could be mitigated by reducing emission of fine particulate matter, sulfur dioxides (SO_2), nitrogen oxides (NO_x), and hydrocarbons (Malm 1999). Possible methods that could mitigate air quality impacts are shown in Table A4-15 in Appendix 4. This table applies only to traditional oil and gas development.

4.2.1 Impacts Common to All Alternatives

Several of the resources areas listed below (air resource management; cultural, forest management; paleontology; socioeconomics; special designations/management areas [SD/MAs]; visual resource management [VRM]; water quality, watershed, and soils management; wild horses; and wildlife and fish management) will have only negligible impacts on air quality.

Air Resources

The air quality monitoring activities, which include construction of monitoring stations and vehicular travel to service the monitoring stations, would have minimal impact on air resources. Information obtained from monitoring would add to the knowledge base on which future air-related decisions would be made.

Cultural

Short-term, localized increases in fugitive dust and vehicle exhaust emissions would occur during excavations for data recovery at cultural resource sites.

Wildland Fire and Fuels Management

Wildland and prescribed fires would cause short-term emissions of particulate matter (PM) and carbon monoxide (CO) that could be spread over large portions of the RMPPA depending on the size of the fire and meteorological conditions. In addition, particulate emissions, CO, NO_x, and hydrocarbons (volatile organic compounds [VOC] and HAPs) would result from use of heavy equipment during fire suppression activities. Emissions would be generated from internal combustion engines from vehicular exhausts (referred to as tailpipe emissions) and directly from non-road engines (chainsaws, etc.).

Forest Management

The use of heavy equipment during timber hauling operations, such as logging trucks, on paved and unpaved roads would cause emissions of PM, CO, NO_x, SO_2, and VOCs. The burning of slash piles after timber harvesting would cause short-term emissions of PM and CO. The use of skidders or tractors for skidding timber materials from the harvesting area to the loading or decking area during timber harvest would produce some of the same emissions, but to a lesser degree.

Lands and Realty

The various construction activities authorized under lands and realty management (such as wind power, communication sites, transmission lines, and pipeline projects) would produce emissions of PM. Soil disturbance and travel on unpaved roads are the main causes of the emissions. Tailpipe emissions from vehicular travel and emissions from equipment use would result from construction activities.

Livestock Grazing

Vehicle travel associated with trucking livestock and constructing and maintaining range improvements would generate tailpipe emissions and dust.

Minerals

Air emissions from combustion processes and construction activities would be produced from all the activities associated with oil and gas development and minerals mining.

Air emissions would be produced during all phases of oil and gas development, including exploration, well development, production, and well abandonment and road closures. During exploration and development, traffic on unpaved and paved roads would cause emissions of PM, CO, NO_x, SO_2, and VOCs. During well development and completion, well flaring and associated emissions would cause PM, CO, NO_x, SO_2, and VOC emissions (which includes HAPs). Also, during well development, drilling activities and construction activities would cause particulate emissions and tailpipe emissions because of

heavy equipment usage. Emissions associated with each well development and completion are not continuous emissions but are rather temporary emissions. Typical well drilling and completion for each well will be performed for a limited number of days, but for a specific proposed project, drilling may occur in the RMPPA for several years.

Air emissions are produced during oil and gas production. Emissions of NO_x, CO, and formaldehyde from compression activities (burning of natural gas) would occur. PM, CO, NO_x, and VOCs would be produced from any glycol operations and flashing. Any flaring would cause PM, CO, NO_x, SO_2, and VOC emissions (which includes HAPs).

During well abandonment and road closure, PM from travel over unpaved roads and demolition activities would result.

Air emissions would be produced during mining operations and reclamation activities. During mining activities, PM emissions would be produced from overburden removal, blasting, truck loading, bulldozing, grading, storage piles, railroad loading, and travel of heavy equipment over unpaved roads. Gaseous emissions from tailpipes (CO, NO_x, SO_2, and VOCs) would occur from heavy equipment, trains, and vehicular travel.

OHV Management

The use of OHVs would cause fugitive dust emissions of PM from traffic on unpaved trails, and emissions of PM, CO, NO_x, and VOCs directly from the tailpipe. In the winter, tailpipe emissions primarily occur from snowmobiles.

Paleontology

Short-term, localized increases in vehicular fugitive dust emissions would occur during excavations at and during travel to paleontological sites.

Recreation

PM emissions from travel on unpaved roads and gaseous tailpipe emissions from vehicles would occur.

Socioeconomics

Upward trends in populations within the RMPPA create the potential for long-term additional increases in emissions from all other resource management programs.

Special Designations/Management Areas

Impacts to air quality would result from activities in SD/MAs from exhaust emissions and fugitive dust. Those activities associated with the management of SD/MAs (e.g., fire management and project construction) are covered under the other resource topics.

Transportation

The maintenance of unpaved roads and shoulders of paved resource roads would cause PM emissions and tailpipe emissions. Of particular concern are the emissions of PM from road graders.

Vegetation Management

Trucks and heavy equipment (chain saws, fire engines, bulldozers) used in vegetation management and control would cause dust from unpaved roads. In addition, prescribed fires used for vegetation treatment would cause particulate and gaseous emissions. Trucks and equipment to conduct and control prescribed fire would cause tailpipe emissions. Areas receiving vegetation treatment would add short-term increases in PM until vegetations recover sufficiently to stabilize exposed soil.

Visual Resources

No direct impacts to air resources would occur from VRM. Management practices, such as mitigation measures designed to retain visual quality of VRM Class I and II areas, would reduce or eliminate emissions from development and OHV use. VRM in Class III and IV areas creates the potential for long-term emission increases.

Wild Horses

Trucks, heavy equipment, and helicopters used to gather wild horses would cause a short-term increase in tailpipe and fugitive dust emissions.

Wildlife

Construction activity to manage wildlife and fish habitat would contribute to air emissions of PM. To a lesser degree, CO, NO_x, SO_2, and VOCs would be generated from tailpipes. These impacts would be short term.

4.2.2 Impacts Under Alternative 1: Continuation of Existing Management

Figure 4-25 summarizes total and specific pollutant emissions for all alternatives. Alternative 1 emissions have been estimated for the base year (2003), 2008, and 2023. The total emissions increase over time for this alternative from the base year of 20,960 tons per year of pollutants to 43,545 tons per year by 2023.

4.2.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Figure 4-25 summarizes total and specific pollutant emissions for all of the alternatives. Alternative 2 emissions have been estimated for the base year (2003), 2008, and 2023. The total emissions increase over time for this alternative from the base year of 20,960 tons per year of pollutants to 46,298 tons per year by 2023, the highest of any alternative.

4.2.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Figure 4-25 summarizes total and specific pollutant emissions for all of the alternatives. Alternative 3 emissions have been estimated for the base year (2003), 2008, and 2023. The total emissions increase over time for this alternative from the base year of 20,960 tons per year of pollutants to 35,282 tons per year by 2023, the lowest of any alternative.

4.2.5 Impacts Under Alternative 4: Proposed Plan

Figure 4-25 summarizes total and specific pollutant emissions for all of the alternatives. Alternative 4 emissions have been estimated for the base year (2003), 2008, and 2023. The total emissions increase over time for this alternative from the base year of 20,960 tons per year of pollutants to 42,305 tons per year by 2023.

4.3 CULTURAL RESOURCES

This section presents the impacts to cultural resources from management actions for other resource programs. Existing conditions concerning cultural resource management are described in Section 3.3.

Significance Criteria

Impacts to cultural resources would be considered significant if the following were to occur:

- Management actions that result in adverse effects to properties listed or determined eligible for listing on the National Register of Historic Places (NRHP) or considered important to Native American groups.

Methods of Analysis

The analysis of environmental impacts is based on interdisciplinary team knowledge of resources and the project area, review of existing literature, and information provided by other agencies and institutions. Effects are quantified where possible. In cases where quantitative data are not readily available, best professional judgment or qualitative assessments are used to describe impacts.

The criteria for assessing impacts are those stipulated by the federal regulations for Protection of Historic Properties, which state that an undertaking may have an adverse effect when it—

> "May alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR Part 800.5(a)(1)). Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther in distance or be cumulative."

The analysis is based on the following assumptions:

- The overall density of cultural properties in the RMPPA is estimated to be approximately 22 sites per section (640 acres), or approximately 1 site per every 29 acres; however, the density varies by cultural subregion (Table 3-3). These densities are based upon the number of sites identified during cultural resource inventories within each region. The overall density of cultural properties in those areas of high and moderate oil and gas potential is estimated to be approximately 18 sites per section (640 acres), or approximately 1 site per every 35 acres.
- Cultural resources would continue to be found throughout the RMPPA in proportion to the assumptions of site density for each subregion.
- The number of sites that would be impacted by various actions is directly correlated with the degree, nature, and quantity of surface disturbing and other disruptive activities within the identified subregions within the RMPPA.
- When avoidance would be detrimental to other resource values and management direction, mitigation of impacts to cultural resources would be performed in proportion to their significance.
- Cultural resource protection would occur in accordance with State Historic Preservation Officer (SHPO) coordination requirements and other federal regulations.

- A cultural resource inventory, evaluation of site NRHP eligibility, and assessment of potential effects from federal actions are required by law before the initiation of all surface disturbing and other disruptive activities. This generally requires a Class III (100 percent) survey of the affected area. This allows for prescriptive mitigation of impacts through avoidance or other measures where necessary, and effectively minimizes or eliminates the potential for unmitigated impacts to identified cultural resources.
- All authorizations for land and resource use must comply with all relevant laws, regulations, and policies. See Appendix 5 for a discussion regarding the implementation of the cultural resource management laws, regulations, and policies.

4.3.1 Impacts Common to All Alternatives

Maintaining proper air quality would help protect and preserve environmentally sensitive cultural resources, such as rock art, aspen art, and historic and prehistoric wooden structures. Air quality management actions, such as development of air quality monitoring stations, would require standard identification and mitigation measures to minimize impacts on cultural resources.

Management actions associated with cultural resources would provide direct protection to cultural properties from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity (Appendix 5) and include measures such as cultural resource inventory, evaluation of NRHP eligibility, and mitigation of potential effects, generally through avoidance. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve cultural resources, mitigation measures would be prescribed on a case-by-case basis, depending upon the nature of the action and the type of cultural resource involved. Mitigation measures would ensure that any potential impact from the proposed action would not result in significant effects to known historic properties. These management actions would apply to any proposed actions that have the potential to impact cultural resources.

Cultural resource inventory, recordation, evaluation, and data recovery excavation would increase the site database and further the understanding of history and prehistory. This increased knowledge would allow for the implementation of revised and more appropriate practices to manage future undertakings. Data recovery excavations would remove all or a portion of in situ cultural materials at sites, but would require an approved research design to minimize future data loss should new data recovery and analysis techniques be developed.

Managing cultural resources in accordance with the Cultural Resource Use Allocations would ensure that cultural resources are appropriately managed and preserved (Appendix 5). Cultural resources identified for scientific use would be preserved until their research potential is realized. Those conserved for future use would be preserved until specific conditions for their use are met. Cultural resources identified for traditional use would be managed for long-term preservation. Those identified for public use would be managed for long-term preservation and would be interpreted for public education. Those identified for experimental use would be protected until the experimental use is realized. Cultural resources that have been determined not eligible for the NRHP would be discharged from management and therefore would no longer be protected from future management actions.

Where the integrity of setting contributes to NRHP eligibility, management actions resulting in visual elements that diminish the integrity of the property's setting would be managed in accordance with the Wyoming State Protocol and best management practices (BMPs) (Appendix 5). Potential effects would be determined by comparing the existing environment without the proposed action against the projected environment with the addition of the proposal. Potential effects would be minimized through the use of

BMPs as discussed in Appendix 5. Additional mitigation measures would be developed on a case-by-case basis as necessary in consultation with the SHPO and other affected parties. This would ensure the protection of cultural resources such as Native American sacred sites, traditional cultural properties, and other sites where the setting contributes to the NRHP eligibility.

Protective measures would be developed for threatened or sensitive sites determined as a result of Section 110 inventory (National Historic Preservation Act [NHPA]) and monitoring, effectively minimizing any potentially significant impacts. These types of threats would generally involve activities or processes that are not permitted such as natural erosion or dispersed recreational activities. Protective measures would be site-specific based on the nature of the threat or impact and would be developed in consultation with the SHPO and other affected parties as appropriate.

Sacred or sensitive sites would be identified through consultation and cooperation with Native American tribes at both the planning and project-specific levels. Protection measures such as appropriate avoidances or other mitigation measures would be developed and implemented in consultation with the affected Native American tribes. The location and nature of these types of resources are held in strict confidence generally at the request of the affected tribe(s). No adverse effects are anticipated to Native American sacred or sensitive sites.

Displacement and loss of cultural resources would occur as a result of wildland fires, surface disturbances caused by suppression activities (e.g., construction of fire lines, bulldozing of access roads, and general movement of heavy equipment), and post-fire rehabilitation activities. Displacement of cultural resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Because of the unplanned nature of wildland fires, impacts to cultural resources from wildland fires and suppression activities may be assessed subsequent to the fire. Some high-priority cultural resources such as rock art and historic structures have been identified for special protections and included in the specific fire management plans.

Rock art, either Native American or Euro-American, would be damaged by smoke and soot as well as by rock exfoliation or spalling caused by the extreme heat associated with wildland fires. Loss of vegetation from wildland fires and suppression activities would increase the potential for soil erosion, resulting in displacement and/or loss of cultural resources. However, wildland fires would generally enhance surface visibility (at least in the short term), allowing otherwise undetected and nonflammable cultural materials to be identified and recorded. During large fires, cultural resource specialists would be present to ensure that suppression activities do not adversely affect known historic properties. In addition, cultural resource specialists would inventory fire lines and access roads where surface disturbance would be anticipated prior to suppression activities to ensure protection of cultural properties. Suppression activities would also minimize the potential for devastating wildland fires, which would help preserve flammable cultural resources such as historic and prehistoric wooden structures and aspen carvings.

Surface disturbing and other disruptive activities resulting from forest management, lands and realty management, livestock grazing management, minerals management, OHV management, recreation resources management, vegetation management, wild horse management, and wildlife and fisheries management actions would have the potential to directly impact cultural resources not identified prior to the activity. Unanticipated subsurface discoveries (cultural resources discovered during ground disturbing activities) would occur from surface disturbing and other disruptive activities. Unanticipated discoveries would result in displacement or loss (either complete or partial) of the cultural resource involved. Displacement of cultural resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. However, mitigation of impacts from discoveries is often accomplished through data recovery excavations that increase the understanding of prehistory. The number of unanticipated discoveries would be minor but

potentially concentrated in areas with active soil deposition. Potential impacts to cultural resources identified in a discovery situation would be greater than impacts to resources that were previously identified (and thereby avoided or subjected to mitigation measures) because damage to discovered sites occurs prior to their recordation and evaluation, thereby complicating mitigation procedures.

Lands and realty management, livestock grazing management, minerals management, recreation resources management, and wildlife and fisheries management actions resulting in development of projects within the setting that contribute to NRHP eligibility would be mitigated to minimize significant effects. Assessment of potential impacts would be conducted through viewshed analyses, onsite inspection, and photo analysis. Mitigation measures would include, but not be limited to, decreasing the height of structures, using paint and topography to blend structures into the background, mowing and reseeding right-of-way (ROW) corridors, and using materials that match the existing environment to construct access roads (Appendix 5). Significant impacts would occur if developments could not be mitigated to eliminate adverse effects to the setting.

Lands and realty management actions not associated with minerals development would disturb approximately 5,794 acres over the life of the plan under all alternatives. These actions would potentially affect an estimated 200 cultural properties. Required cultural resource inventory and mitigation measures conducted in conjunction with ROW actions would serve to protect most cultural resources from significant damage and increase the database of known cultural properties. A small but proportional number of these sites would be adversely impacted as a result of unanticipated discoveries, potentially resulting in significant impacts. Cultural resources would be protected from surface disturbing activities because of locatable mineral withdrawals on 935,530 acres.

Implementing actions to achieve the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve soil stability and vegetation cover, thereby protecting cultural resources. Overuse of an area by livestock, wildlife, and wild horses would potentially accelerate soil erosion, which would potentially lead to exposure and destruction of cultural resources. Animal trampling and wallowing directly impacts cultural artifacts and features on or just below the surface through breakage and scattering. Animal scratching and rubbing affects certain types of cultural properties, including historic and prehistoric structures and rock art sites. In most instances, impacts from these types of animal behaviors on cultural resources would be minimal. However, long-term impacts from grazing would potentially occur from repeated trampling on cultural sites over time, especially along fence lines, near water sources, and in sheltered or shaded areas. Proper construction of water developments and range improvements as well as proper placement of salt and mineral supplements would help minimize adverse impacts to cultural resources. Areas would be inventoried and evaluated for cultural resources prior to the construction of fences, water developments, and other range improvements, and appropriate mitigation measures would be implemented if needed.

Activities associated with minerals management have the greatest potential to directly and indirectly impact cultural resources because of the amount of disturbance proposed for the life of the plan. Unlike many of the other resource management actions, the proposed disturbance from minerals management would be concentrated in specific areas within the RMPPA (Map 4-7, Oil and Gas Project Areas and High and Moderate Potential Areas). These areas of high and moderate oil and gas potential fall within portions of the Great Divide Basin (61 percent), Hanna Basin (34 percent), Middle Medicine Bow (3 percent), Separation Flats/Rawlins Peak (2 percent), Sierra Madre Uplands (45 percent), and Washakie Basin (84 percent) cultural sub-regions (as discussed in Section 3.3, Cultural Resources). No impacts are anticipated to cultural resources from oil and gas management activities in the Upper North Platte, Shirley Basin, Laramie Basin, Sweetwater Arch, Medicine Bow Mountains, Laramie Mountains, Eastern Plains, or Bates Hole cultural subregion areas. Most of the high and moderate oil and gas potential areas have been previously leased, and BLM must honor these existing rights. Significant impacts would occur in areas

where BLM must allow the lease holder to develop the lease and adverse effects to cultural resources cannot be avoided. In most cases, impacts would be mitigated through the use of BMPs, but special mitigation measures may be necessary on a case-by-case basis for specific projects. Impacts to the cultural resources from geophysical exploration would be minimal with implementation of BMPs.

Locatable mineral exploration and mineral material disposals would have the potential to impact cultural resources. Standard inventory and mitigation measures would protect cultural resources from displacement or loss resulting from surface disturbing activities. Reasonably foreseeable development activities for locatable minerals would not affect significant acreage; therefore, there would be little or no effect to cultural resources. Mineral material permits are discretionary. If impacts to cultural resources are identified, the impacts would either be mitigated or the permit denied.

OHV use on improved roads would have little or no impact on cultural resources. However, the majority of unimproved two-track roads and vehicle routes within the RMPPA have not been inventoried for cultural resources, increasing the potential for unmitigated impacts. OHV use of these roads and vehicle routes would disturb or displace cultural resources located within the roadways. Inappropriate use of unimproved roads and vehicle routes by OHVs would accelerate erosion and thus disturb soils that contain cultural resources. OHV use of historic roads, especially in areas with poor ground conditions, would potentially have an adverse effect on the physical integrity of the road. Where impacts to cultural resources from OHV use are identified, closures to motorized vehicle use may occur to protect sensitive cultural resources. Little or no impact to cultural resources is anticipated from off-road OHV use for “necessary tasks”.

Impacts to cultural resources from paleontology management would be minimal. Standard inventory and mitigation measures conducted in conjunction with paleontology management actions would protect cultural resources.

Management of special recreation management areas (SRMAs) would encourage recreation and the potential development of facilities, which could result in damage to cultural resources through ground disturbing activities and indirectly through the larger presence of human activity. Cultural inventories would be completed before any new facilities were constructed, and appropriate mitigation measures would be applied.

Protections afforded to SD/MAs (i.e., intensive management of surface disturbing and other disruptive activities) would indirectly protect cultural resources located in these areas by reducing the potential for unanticipated discoveries and subsequent loss of cultural information. ROW exclusion requirements and no surface occupancy (NSO) stipulations would provide the greatest level of protection by prohibiting surface disturbing activities.

Transportation and access management would impact cultural resources by pursuing new access areas (Table 2-8) and consolidating public lands to increase recreational opportunities in these new areas, which would increase the potential for incidental or purposeful disturbance of cultural resources. Facilitating use of these areas would result in increased surface disturbing and disruptive recreational activity and loss of vegetative cover, which would increase the potential for exposure and destruction of cultural resources.

Actions designed to maintain vegetation resources would protect cultural resources by managing surface disturbance and minimizing soil erosion, which would help prevent the degradation of soils that may contain cultural resources. Achieving the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve environmental conditions, soil stability, and vegetation cover, thereby protecting cultural resources from exposure, deterioration, and loss. Vegetation treatments would reduce cover in the short term, allowing otherwise undetected cultural materials to be identified and recorded.

However, vegetation treatments would also likely increase soil erosion in the short term and potentially result in displacement and/or loss of cultural resources. Displacement of cultural resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. BMPs and conservation measures designed to protect vegetation communities through avoidance or by limiting surface disturbance would indirectly protect cultural resources in these areas.

In all VRM classes, activities would be mitigated so as not to compromise the objectives of the VRM class (Appendix 25). Cultural properties located in VRM Class I areas would be protected because surface disturbing and other disruptive activities would be prohibited in these areas. The integrity of the setting of cultural resources located in VRM Class II areas would also receive protection from management actions that would require structures to blend into the landscape when possible, thus minimizing the potential for adverse effects (Appendix 5). Cultural properties located in VRM Class III and IV areas would be subject to a higher level of surface disturbing and other disruptive activity, as these areas allow for moderate and high levels of landscape alteration, respectively.

Water quality, watershed, and soils management actions that control surface disturbing and other disruptive activities near water resources, such as wetland/riparian areas, would protect cultural resources by reducing the potential for unanticipated discoveries. Soils management would provide long-term indirect benefits to cultural resources by minimizing soil erosion, thereby preserving cultural properties. Surface disturbing activities associated with water quality, watershed, and soils management, such as stream restoration and headcut remediation projects, would require standard inventory and mitigation measures to minimize impacts on cultural resources.

Restrictions on surface disturbing and disruptive activities as a result of wildlife and fisheries management actions and compliance with the Endangered Species Act (ESA) would provide indirect protections for cultural resources. Intensive management of surface disturbing and disruptive activities in all raptor concentration areas (RCA) would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect buried cultural deposits located within these areas. In addition, minimizing construction disturbance would indirectly protect cultural resources by limiting the area of disturbance. Timing restrictions on surface disturbing and disruptive activities within mountain plover habitat would have little or no impact to cultural resources as surface disturbing activities would still be allowed in these areas during other times of the year.

4.3.2 Impacts Under Alternative 1: Continuation of Existing Management

Management actions associated with air quality management, paleontology management, and wild horse management would have little or no impact to cultural resources.

Management actions associated with cultural resources would provide direct protection to cultural properties from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity (Appendix 5) and include measures such as cultural resource inventory, evaluation of NRHP eligibility, application of BMPs, and mitigation of potential effects, generally through avoidance. Specifically, areas within 1/4 mile of cultural properties where the setting contributes to NRHP eligibility would be avoidance areas for all surface disturbing and other disruptive activities. Where possible, this would protect the physical integrity of cultural properties from surface disturbing and other disruptive activities that may compromise the values making them eligible for NRHP. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve cultural resources, mitigation measures would be

prescribed on a case-by-case basis, depending on the nature of the action and the type of cultural resource involved. Mitigation measures would ensure that any potential impact from the proposed action would not result in significant effects to cultural resources.

Pursuing land acquisitions to preserve cultural resources would increase protection of cultural properties that would otherwise fall outside of federal jurisdiction. Cultural resources located within land acquisitions would benefit from protection measures afforded by cultural resource laws and regulations. Cultural resources located outside of federal jurisdiction are not afforded the same protection measures; thus, irreplaceable data would have a greater likelihood of being lost.

In sensitive areas, such as those with active soil deposition, BLM-permitted archaeologists would be required to monitor surface disturbing activities based on site-specific needs. The presence of a monitor is to ensure that buried cultural materials are immediately identified and that construction activities in that area are halted to avoid further impacts to the site. Because the site is identified as soon as any part is exposed, a monitor can often minimize the adverse effect to the site, reducing the impact.

Wildland suppression activities (Appropriate Management Response [AMR]) would be considered in the protection of natural and cultural resources. This would help reduce damage to cultural resources caused by suppression activities by considering these resources when determining the degree and location of suppression activities.

Forest management actions would result in the treatment of up to 7,000 acres of forestlands over the life of the plan for commercial and pre-commercial thinning and to fulfill Stewardship and Service Contracts associated with the Healthy Forest Restoration Act of 2003. The surface disturbance associated with these activities would potentially affect an estimated 241 cultural properties. Moreover, allowing noncommercial firewood gathering without considering potential cultural resource impacts could result in a limited loss of cultural resources, such as tree carvings and historic and prehistoric wooden structures. Standard inventory and mitigation procedures conducted in conjunction with forest management actions would protect cultural resources from significant damage and would increase the database of known cultural properties (Appendix 5).

The lands and realty management program has identified 61,010 acres of lands for disposal under this alternative, which would potentially affect an estimated 2,104 cultural properties. Land disposal would place these cultural properties outside of federal jurisdiction and thereby eliminate protection under federal management policies. Cultural resource inventories and evaluations required prior to transferring lands from federal jurisdiction would ensure that cultural properties are adequately documented, evaluated, and mitigated prior to ownership changes. BLM may retain or obtain lands containing important cultural and historic resources, providing protection under federal management policies.

Approximately 63,670 acres would be closed to locatable mineral entry and future land disposal actions. This would provide additional protection to cultural resources located in these areas by reducing surface disturbing and other disruptive activities and would eliminate the possibility of placing undiscovered cultural resources outside of federal jurisdiction.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Because of the large-scale nature of these types of developments, there would be the potential to adversely affect those sites where the setting contributes to the properties' NRHP eligibility. Areas with important resource values such as significant cultural resources would be avoided where possible to reduce the impacts from these types of developments (Map 2-30). Where it becomes necessary to place the developments within the avoidance areas, the effects would be intensively managed to reduce the impacts. Some adverse impacts

from these types of developments could be anticipated to cultural resources where the setting is an aspect of integrity. Many of these developments are visually obtrusive at distances greater than those identified for avoidance. In addition, oil and gas development, locatable mineral entry, and mineral material disposal within 1/4 mile of the incorporated boundaries of cities and towns (1,500 total acres) would be intensively managed. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect buried cultural deposits within these areas.

Approximately 900 acres would be disturbed by the construction of livestock range improvements, including fences, spring developments, other water developments, and livestock exclosures, over the life of the plan. This would potentially affect an estimated 31 cultural properties. Standard inventory and mitigation measures conducted in conjunction with range improvement actions would protect most cultural resources from significant damage and would increase the database of known cultural properties (Appendix 5). A small but proportional number of these sites would be adversely impacted as a result of unanticipated discoveries, but would be mitigated through standard treatment measures (Appendix 5).

Under Alternative 1, it is anticipated that 8,945 oil and gas wells would be drilled over the life of the plan, disturbing approximately 62,000 acres of land (including all related facilities and pipelines on federal and nonfederal lands). This would potentially affect an estimated 1,771 cultural properties located within those areas of high and moderate oil and gas potential (Map 4-7). Standard identification and mitigation measures conducted in conjunction with mineral development would protect most cultural resources that are located on federally administered lands or that are involved in federal actions from significant damage and would increase the database of known cultural properties. A small percentage of these sites would be adversely impacted as a result of unanticipated discoveries and trespass violations but would be mitigated through standard treatment measures (Appendix 5). In addition, special stipulations would be added to new oil and gas leases where specific cultural resource values have been identified.

Impacts to cultural resources from OHV management would be minor. With the exception of the Dune Ponds Cooperative Management Area (CMA) and 23,020 acres of closed areas, OHV travel would be limited to designated or existing roads and vehicle routes. The unvegetated portions of the Dune Ponds CMA would be open to OHV use. This 3,730-acre CMA has not been inventoried for cultural resources. Continued unrestricted use of these areas would potentially disturb or displace cultural resources. However, because of the limited area and the active nature of the sand dunes, this impact would be minimal. Cultural resources located in areas closed to OHV use (23,020 acres) would be protected from disturbance or displacement resulting from OHV-related activities. Allowing OHV use off of existing roads for the purposes of retrieving big game kills or accessing camping sites would potentially disturb or displace cultural resources in poor soil conditions (i.e., saturated or loosely compacted soils).

Recreation areas would be managed to limit surface disturbance. Implementing an NSO stipulation for oil and gas development activities in developed and undeveloped recreation sites (9,660 acres) and intensively managing such activity within 1/4 mile of these sites (7,930 acres) would limit surface disturbance and thereby help prevent damage to cultural resources located in these areas. Closing developed recreation sites (5,560 acres) to locatable mineral entry and mineral material disposals would provide further protection from surface disturbing and other disruptive activities.

Little or no impacts would be anticipated to cultural resources from management actions associated with the Shamrock Hills area, Laramie Peak area, Red Rim-Daley area, Pennock Mountain area, Shirley Mountain area, Blowout Penstemon area, White-Tailed Prairie Dog area, High Savery Dam and Reservoir area, Continental Divide National Scenic Trail area, OHV areas, Jelm Mountain area, Pedro Mountains area, Laramie Plains Lakes area, and Rawlins Fishing area SD/MAs.

Surface use restrictions associated with management of SD/MAs would indirectly protect cultural resources located in these areas by reducing the potential for unanticipated discoveries and subsequent loss of cultural information. The Como Bluff area (1,690 acres), Sand Hills area (7,960 acres), Jep Canyon area (13,810 acres), Chain Lakes area (30,560 acres), Wick-Beumee area (280 acres), Laramie Plains Lakes area (1,600 acres), Upper Muddy Creek Watershed/Grizzly area (16,340 acres), and North Platte River area (5,060 acres) would require intensive management of surface disturbing and other disruptive activities. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to disturb buried cultural deposits located within the SD/MAs.

The area within 1/4 mile, or the visual horizon, whichever is closer, of the Historic Trails would be an avoidance area for surface disturbing and other disruptive activities. In most cases, proposed facilities would be relocated outside of the avoidance area, protecting cultural resources located within. If the location cannot be avoided, mitigation measures would be required to reduce the potential for impacts to cultural resources.

All surface disturbing and other disruptive activities within wilderness study areas (WSA) (68,120 acres) and within 1/4 mile of the eligible segments of the Wild and Scenic Rivers (WSR) (Map 2-20) as well as surface disturbance associated with new leases within the Stratton Sagebrush Steppe Research Area (5,530 acres) would be prohibited, thereby providing the greatest level of protection to cultural resources.

Vegetation and weed treatments would minimize the potential for devastating wildfires, increasing the long-term protection of perishable cultural resources, such as historic and prehistoric wooden structures and aspen carvings that could be lost in such events. Vegetation and weed treatments would impact approximately 106,000 acres in the RMPPA over the life of the plan. Although as many as 3,655 cultural properties would potentially be involved, only a small portion of these sites would be sensitive to vegetation treatment measures. Identification and mitigation measures conducted in conjunction with vegetation treatments would serve to protect sensitive cultural resources from significant damage (Appendix 5).

Protections afforded Special Status Plant Species and habitat would indirectly protect cultural resources by restricting the amount and size of disturbances that would potentially adversely affect cultural resources through displacement or loss. Activities associated with oil and gas leasing would be intensively managed in areas of occupied habitat for threatened, endangered, proposed, and candidate plant species. All surface disturbing activities would be intensively managed in blowout penstemon habitat. Recreational sites would not be authorized in Colorado butterfly plant habitat or in Ute ladies'-tresses plant habitat. These actions would indirectly protect cultural resources that are located within these areas.

Cultural properties located in VRM Class I areas (68,160 acres) would receive the greatest protection because surface disturbing and other disruptive activities would be prohibited in these areas. Approximately 359,610 acres would be designated as VRM Class II under this alternative. The integrity of the setting of cultural resources located in VRM Class II areas would receive protection from management actions that would require structures to blend into the landscape when possible, thus minimizing the potential for developments that would degrade the setting of these sites. This would provide indirect protections to the setting of Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility.

Water quality, watershed, and soils management actions requiring that surface disturbing and other disruptive activities avoid identified 100-year floodplains; areas within 500 feet of perennial waters, springs, and wetland/riparian areas; and areas within 100 feet of the inner gorge of ephemeral channels would provide additional protection to cultural resources located in these areas by reducing the potential

for such activities to adversely affect cultural resources through displacement or loss. Erosion caused by surface discharge of produced water in the Colorado River Basin, the North Platte River Basin, and the Great Divide Basin would potentially cause adverse affects to cultural resources located near the stream channel or in new reservoir sites through displacement or loss.

Surface use restrictions associated with management of wildlife and fisheries would indirectly protect cultural resources located in specific areas by reducing the potential for unanticipated discoveries and subsequent loss of cultural information. Surface disturbing and disruptive activities would be intensively managed in RCAs (18,400 acres), neotropical and other migratory bird habitats, upland game bird habitats, amphibian habitats, reptile habitats, and crucial habitat for other sensitive species. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect buried cultural deposits located within these areas. In addition, well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence would not be allowed within 825 feet of active raptor nests (1,200 feet for ferruginous hawks), and surface disturbing and disruptive activities would be avoided within white-tailed and black-tailed prairie dog towns. Cultural resources located within these areas would be protected from displacement or loss. Timing restrictions on surface disturbing and disruptive activities within raptor, big game, Western yellow-billed cuckoo, greater sage-grouse, and sharp-tailed grouse habitat would have little or no impact to cultural resources as surface disturbing activities would still be allowed in these areas during other times of the year.

Summary

It is anticipated that 13,694 acres would be disturbed as a result of activities related to forest management, lands and realty management, and livestock management. This disturbance would potentially impact an estimated 472 cultural properties through displacement or loss.

Most of the high and moderate oil and gas areas have been previously leased, and BLM must honor these existing rights. Significant impacts would occur in areas where BLM must allow the lease holder to develop the lease and adverse effects to cultural properties cannot be avoided. It is anticipated that 8,945 oil and gas wells would be drilled, disturbing approximately 62,000 acres of land. This disturbance would potentially impact an estimated 1,771 cultural properties in those areas of high and moderate oil and gas potential. Wells proposed on nonfederal lands where there is no federal involvement would adversely affect both the physical remains of the cultural properties and the integrity of the setting where it contributes to the NRHP eligibility, thus causing a significant impact.

Approximately 319,410 acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SD/MAs, and NSO stipulations. These management actions would provide the greatest indirect protection to cultural resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. In addition, 359,610 acres would be designated as VRM Class II. This would provide indirect protection to the setting of Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility through the intensive management of visual impacts. Actions associated with other SD/MAs; water quality, watershed, and soils management; and wildlife and fisheries management would also provide indirect protection to cultural resources through avoidance and intensive management of surface disturbing and other disruptive activities.

It is anticipated that significant impacts to cultural resources would occur. As discussed above, any surface disturbance has the potential to damage and/or destroy cultural properties potentially eligible for the NRHP through unanticipated discoveries (i.e., cultural resources discovered during ground disturbing activities). Unanticipated discoveries would result in the loss of some or occasionally all of the cultural resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface

disturbing and other disruptive activities would protect most cultural resources from significant damage. Cultural monitoring in sensitive areas would reduce the potential for significant impacts resulting from discovery situations. The potential for significant impacts would be directly proportional to the amount of surface disturbance.

4.3.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The impacts to cultural resources from air quality management; forest management; OHV management; paleontology management; recreation management; wild horse management; and water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Impacts to cultural resources from cultural resource management actions would be similar to those identified in Alternative 1. However, land acquisitions to preserve and protect select cultural properties would not be as actively pursued, allowing a greater number of significant properties to be impacted that would have been protected under Alternative 1.

Impacts to cultural resources from fire and fuels management would be similar to those identified in Alternative 1, except that more wildland fires would be suppressed. This would reduce the damage to flammable cultural resources, such as historic and prehistoric wooden structures and aspen carvings. Increased suppression and associated surface disturbance would potentially result in impacts to a greater number of buried cultural deposits. Furthermore, through the buildup of flammable materials, increased suppression would increase the long-term potential for catastrophic fires that would damage a wider range of cultural resource types.

Impacts to cultural resources from lands and realty management would be similar to those identified in Alternative 1, except that 57,270 fewer acres would be closed to locatable mineral entry and future land disposal actions. This would reduce the level of protection to cultural resources in these areas by increasing surface disturbing and other disruptive activities. An additional 14,780 acres would be precluded from disposal actions. This would further reduce the amount of land that could be removed from federal jurisdiction and the number of cultural resources that could be exempted from federal management policies.

Impacts of livestock grazing management on cultural resources would be similar to those identified in Alternative 1, except that approximately 1,140 acres would be disturbed by the construction of livestock range improvements over the life of the plan. This would potentially affect an estimated 39 cultural resources.

Impacts of oil and gas management actions on cultural resources would be similar to those impacts identified in Alternative 1, except that more acreage would be open to oil and gas leasing with fewer restrictions from other programs. Areas closed to leasing or otherwise restricted from development, surface disturbing and other disruptive activities, or surface occupancy would be reduced. Overall, 9,198 wells would be drilled over the life of the plan, disturbing approximately 64,000 acres (including all related facilities and pipelines on federal and nonfederal lands). This would potentially affect an estimated 1,829 cultural properties located within those areas of high and moderate oil and gas potential (Map 4-7). Impacts to cultural resources from the additional wells located on federally administered lands or that are associated with federal actions would be mitigated through standard identification and mitigation practices. The increase in development would increase the potential for adverse impacts from unanticipated subsurface discoveries and trespass violations. However, a greater number of cultural resource inventories and site mitigations (e.g., excavations) would be required, which would expand the cultural resource database.

Impacts to cultural resources from SD/MAs would be similar to those impacts identified in Alternative 1, except that the NSO stipulation on new leases within the Stratton Sagebrush Steppe Research Area ACEC (5,530 acres) would not be required. Instead, operators would be required to submit a management plan to describe how activities would affect research objectives, which would lead to the implementation of BMPs and necessary mitigation measures. As a result, surface disturbance associated with new leases would likely occur within the ACEC, thereby increasing the potential for unanticipated discoveries of cultural resources. In addition, no river segments would be suitable for the national WSR systems. Cultural resources would be managed the same in these areas as in the rest of the RMPPA.

Cultural resources would be protected from surface disturbing and disruptive activities associated with locatable mineral entry and mineral material disposals resulting from the closures within the Cave Creek Cave SD/MA (240 acres). Intensive management of timber harvesting within ¼ mile of the Cave Creek Cave complex would indirectly protect cultural resources in that area by restricting or prohibiting surface disturbing and disruptive activities.

As needs are identified, OHV areas would be developed to allow use and promote education. Unrestricted use would potentially promote soil erosion, thereby disturbing or displacing cultural resources. Identification and mitigation measures would ensure that any potential impact associated with OHV SRMAs would not result in significant effects to cultural resources.

Impacts from vegetation management actions on cultural resources would be similar to those identified in Alternative 1, except that vegetation and weed treatments would be increased to approximately 1,003,720 acres over the life of the plan. An estimated 34,611 cultural properties would be involved in these areas; however, only a small portion of these sites would be sensitive to vegetation treatment measures. Identification and mitigation measures conducted in conjunction with vegetation treatments would protect sensitive cultural resources from significant damage. No additional protections would be afforded Special Status Plant Species under this alternative; therefore, there would be no indirect protections for cultural resources in these areas.

Under this alternative, 2,040 fewer acres would be designated as VRM Class I than under Alternative 1, for a total of 66,120 acres. Cultural resources in those areas not managed as WSR segments would not receive the additional protections afforded VRM Class I areas. In addition, 126,780 fewer acres would be designated as VRM Class II than under Alternative 1, for a total of 232,830 acres. As a result, fewer Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility would be protected.

Impacts to cultural resources from wildlife and fisheries management would be similar to those identified in Alternative 1, except that intensive mitigation of surface disturbing and disruptive activities would not be required in sensitive wildlife habitat areas. As a result, surface disturbing and disruptive activities would be allowed over a larger area. Standard cultural resource identification and mitigation measures (Appendix 5) would ensure protection of cultural resources in these areas.

Summary

Under Alternative 2, impacts to cultural resources would be similar to those impacts identified under Alternative 1. However, a slightly greater number of acres would be disturbed, potentially impacting an increased number of cultural properties. It is anticipated that 13,934 acres would be disturbed over the life of the plan as a result of lands and realty management and livestock management activities. This disturbance would potentially impact an estimated 480 cultural properties through displacement or loss. These numbers do not include disturbance acreage or sites potentially impacted from forest management actions.

In addition, 9,198 oil and gas wells would be drilled, disturbing approximately 64,000 acres of land. Wells proposed on nonfederal lands where there is no federal involvement would adversely affect both the physical remains of cultural properties and the integrity of the setting where it contributes to the NRHP eligibility, thus causing a significant impact. This disturbance would potentially impact an estimated 1,829 cultural properties in those areas of high and moderate oil and gas potential. It is likely that more sites would be impacted by surface disturbance and disruptive activities than anticipated in Alternative 1.

Approximately 224,420 acres would be protected from surface disturbing and disruptive activities as a result of VRM Class I areas, SD/MAs, and NSO stipulations. These management actions would provide the greatest indirect protection to cultural resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. The VRM Class II areas would be reduced to include 232,830 acres, resulting in the protection of fewer Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility. In addition, there would be less indirect protection to cultural resources because of the decrease in surface restrictions included in management actions for other resource programs.

It is anticipated that significant impacts to cultural resources would occur. As discussed in the above analysis, any surface disturbance has the potential to damage and/or destroy cultural properties potentially eligible for the NRHP through unanticipated discoveries (i.e., cultural resources discovered during ground disturbing activities). Unanticipated discoveries result in the loss of some or occasionally all of the cultural resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most cultural resources from significant damage. Cultural monitoring in sensitive areas would also reduce the potential for significant impacts resulting from discovery situations. Because disturbance of more surface acres is anticipated, the potential for significant impacts would increase as compared to Alternative 1.

4.3.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The impacts to cultural resources from air quality management, forestry management, paleontology management, and wild horse management would be the same as those identified in Alternative 1.

Impacts from cultural resource management on cultural resources would be similar to those identified in Alternative 1. However, prohibiting surface disturbing and other disruptive activities within ¼ mile or the visual horizon, whichever is closer, of historic properties where the setting contributes to NRHP eligibility would indirectly protect all cultural resources in that zone. This would ensure the protection of those sites from activities that compromise the values making them eligible for NRHP. In addition, all surface disturbance would be monitored in culturally sensitive areas, which would ensure that adverse effects to cultural resources from discovery or trespass situations would be minimized.

Fewer wildland fires would be suppressed under this alternative than under Alternative 1, which would increase the potential for damage to flammable cultural resources such as historic and prehistoric wooden structures and aspen carvings. Damage to rock art from the extreme heat and smoke associated with wildland fires would also increase. Wildland fires would likely increase in size, which would result in increased soil erosion, greater loss of vegetation, and consequential deterioration of cultural properties. However, the potential for damage to buried cultural resources from fire suppression activities would be decreased from Alternative 1, because there would be fewer ground disturbing suppression activities.

Impacts to cultural resources from lands and realty management would decrease, as compared to Alternative 1. Under Alternative 3, no lands would be available for disposal. Retaining all lands under

federal jurisdiction would maintain protections associated with federal management policies. Approximately 271,110 acres would be closed to locatable mineral development and future land disposal actions. This would provide additional protection to cultural resources located in these areas by reducing surface disturbing and other disruptive activities and eliminating the possibility of placing undiscovered cultural resources outside of federal jurisdiction.

Adverse impacts to cultural resources from development activities associated with lands and realty actions would be greatly reduced under Alternative 3. Areas with important cultural resource values would be closed to new wind energy development, utility/transportation systems, and communication sites (66,720 acres; Map 2-32). Closure of these areas would offer the greatest protection to cultural resources from these types of surface disturbing activities. There would still be the potential to adversely affect those cultural resources where the setting contributes to the properties' NRHP eligibility because of the large-scale nature of these types of developments. The area within 1/2 mile of the incorporated boundaries of cities/towns (4,500 total acres) would be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals. These stipulations would preclude surface disturbing and disruptive activities associated with minerals development and would indirectly protect cultural resources in these areas.

Impacts to cultural resources from livestock grazing management would be similar to those identified in Alternative 1. However, the emphasis on fence modification as opposed to new fence construction and the emphasis on small-scale as opposed to large-scale water developments would result in the disturbance of 480 fewer acres over the life of the plan. Under this alternative, only 420 acres would be disturbed, potentially affecting an estimated 14 cultural properties. However, as a result, there would be fewer cultural resource inventories, reducing the potential to increase the site database and further the understanding of history and prehistory.

Impacts to cultural resources from oil and gas development would be similar to those impacts identified in Alternative 1, except that less acreage would be open to oil and gas leasing, with greater constraints from other programs. Areas closed to leasing or otherwise restricted from development, surface disturbing and other disruptive activities, or surface occupancy would be increased. Overall, 8,632 wells would be drilled over the life of the plan, disturbing approximately 56,000 acres (including all related facilities and pipelines on federal and nonfederal lands). This would potentially affect an estimated 1,600 cultural properties located within those areas of high and moderate oil and gas potential (Map 4-7). Impacts to cultural resources from development located on federally administered lands or that are associated with federal actions would be mitigated through standard cultural resource identification and mitigation practices (Appendix 5). The decrease in development would decrease the potential for adverse impacts from unanticipated subsurface discoveries and trespass violations. However, fewer cultural resource inventories and site mitigations (e.g., excavations) that serve to expand the cultural resource database would be required.

Impacts from OHV management actions on cultural resources would be similar to those identified in Alternative 1, except that the 3,730-acre Dune Ponds CMA would be closed to OHV use, thereby eliminating OHV-related impacts to the cultural resources in this area. An additional 48,960 acres would be closed to OHV use, thus protecting cultural resources from disturbance or loss resulting from OHV use. Offroad travel to retrieve big game kills or access camping sites would not be allowed; therefore, there would be no potential for impacts to cultural resources from these activities.

Impacts to cultural resources from recreation management would be similar to those identified in Alternative 1, except that developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/2-mile area (12,750 acres), Shirley Mountain area (37,820 acres), Historic Trails area (66,370 acres), North Platte River area (12,740 acres), Jelm Mountain area (18,100 acres), Pedro Mountains area (18,650

acres), Laramie Plains Lakes area (1,600 acres), and Rawlins Fishing area (330 acres) would be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material sales. These actions would serve to reduce the potential for damage to cultural resources in these areas by limiting the level of surface disturbing and other disruptive activities.

Impacts to cultural resources from SD/MAs would be similar to those impacts identified in Alternative 1, except that management of surface disturbing and disruptive activities within the SD/MAs would be more restrictive. Those areas closed to new oil and gas leasing and closed to locatable mineral entry and mineral material sales would offer the greatest protection for cultural resources because surface disturbing and disruptive activities associated with mineral development would not be allowed. These restrictions would be included in the Sand Hills ACEC and JO Ranch Expansion area (12,680 acres), Jep Canyon area (13,810 acres), Chain Lakes area (30,560 acres), Wick-Beumee area (280 acres), Cave Creek Cave area (520 acres), Laramie Plains Lakes area (1,600 acres), Upper Muddy Creek Watershed/Grizzly area (59,720 acres), and Cow Butte/Wild Cow area (49,570 acres) SD/MAs and all of the suitable WSR segments. Surface disturbing activities within the unique alkaline desert wetland communities would be intensively managed to sustain the sensitive vegetation within the Chain Lakes area, thus providing additional protection to cultural resources from disturbance in these areas. In addition, cultural resources would be protected from surface disturbing activities associated with timber harvesting, locatable mineral entry, and mineral material sales within the 520-acre Cave Creek Cave area.

Those areas open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material sales would also preclude surface disturbing and disruptive activities that could potentially adversely affect cultural resources. These restrictions would be included in the Como Bluff area (1,690 acres).

Those areas open to oil and gas leasing with intensive management of surface disturbing and disruptive activities would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect buried cultural deposits located in the SD/MAs. This restriction would be included in the Shamrock Hills area (18,400 acres), Laramie Peak area (18,940 acres), Red Rim-Daley area (11,100 acres), Pennock Mountain area (7,770 acres), Blowout Penstemon area (17,050 acres), White-Tailed Prairie Dog areas (109,650 acres), High Savery Dam area (530 acres), and Continental Divide National Scenic Trail (600 acres) SD/MAs. These areas would also be closed to locatable mineral entry and mineral material sales, which would preclude surface disturbing and disruptive activities that could potentially adversely affect cultural resources. This would apply only to non-metalliferous locatable mineral entry for the Red Rim-Daley area. Uranium exploration could still potentially adversely affect cultural resources in this area. Cultural resources would be protected from all surface disturbing activities in the Sand Hills and JO Ranch Expansion area (12,680 acres). There would be no adverse impacts from new fence construction or subsequent animal trailing and concentration in this area. The JO Ranch buildings (18 acres) would be stabilized and used as an interpretive center, providing the cultural resource program with a venue for public education on 19th-century ranching in the area and on the roles of historic roads and vehicle routes throughout the area. Requirements for the VRM Class II area around the JO Ranch buildings would indirectly protect other cultural resources where setting is an important aspect of the integrity of the site.

Other restrictions associated with the SD/MAs would provide additional protections to cultural resources from surface disturbing activities not associated with minerals development. Surface disturbing activities would not be allowed within 1/4 mile of the Historic Trails. Surface disturbing and disruptive activities would be restricted or prohibited in aspen communities in the Upper Muddy Creek Watershed/Grizzly and Jep Canyon areas, in aspen and mountain shrub communities within the Cow Butte/Wild Cow area, and within 50 meters (164 feet) of prairie dog towns within the White-Tailed Prairie Dog SD/MA. In addition, no new fences would be allowed within the Cow Butte/Wild Cow area.

The area within 1/4 mile from the Overland Trail, Cherokee Trail, Rawlins-to-Baggs Road, and Rawlins-to-Fort Washakie Road (66,370 acres) would be designated an ACEC (Map 2-8). Surface disturbing activities would be prohibited within the ACEC, which would potentially protect an estimated 2,289 cultural properties within this area. Historic properties where the setting contributes to NRHP eligibility would also benefit because management actions would require structures to blend into the landscape, thus minimizing the occurrence of adverse effects (Appendix 5).

Where impacts from transportation and access to cultural resources are identified, BLM, county, and/or state road densities would not be allowed to exceed levels that diminish or adversely impact these resources. This would reduce the disturbance to cultural resources from road proliferation and limit illicit activities in areas that are difficult to access.

Impacts from vegetation management actions on cultural resources would be similar to those identified in Alternative 1, except that vegetation and weed treatments would be increased to 806,840 acres over the life of the plan. An estimated 27,822 cultural properties would be involved in these areas; however, only a small portion of these cultural properties would be sensitive to vegetation treatment measures. Inventory and mitigation measures conducted in conjunction with vegetation treatments would protect sensitive cultural resources from significant damage. Managing for desired plant community (DPC) would reduce the potential for impacts to cultural resources by enhancing specific plant communities that improve soil stability. However, management for DPC would potentially result in increased herbaceous cover, which would reduce the potential to locate previously unidentified cultural resources and further the understanding of history and prehistory. In addition, occupied habitat for threatened, endangered, proposed, and candidate species would be open to oil and gas leasing with an NSO stipulation. This would provide additional protection to cultural resources in these areas by restricting surface disturbing activities that would potentially adversely affect cultural resources.

Impacts to cultural resources from VRM management would be similar to those identified under Alternative 1, except that 8,560 fewer acres would be designated as VRM Class II, for a total of 351,050 acres. As a result, a significantly greater number of Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility would be protected from developments that would adversely affect the integrity of the setting for these types of sites (Appendix 5).

Impacts to cultural resources from water quality, watershed, and soils management would be similar to those identified in Alternative 1. However, prohibiting the surface discharge of produced water from oil and gas activities in the Colorado River Basin would eliminate the potential for such discharges to expose and damage cultural resources located in stream channels. Under this alternative, water development projects that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would be prohibited. This would provide additional protection to cultural resources located in these areas by limiting surface disturbance and associated damage from impoundment construction to undocumented resources.

Impacts to cultural resources from wildlife and fisheries management would be similar to those impacts identified in Alternative 1, except that restrictions on surface disturbing and disruptive activities would increase in sensitive wildlife habitat areas. Well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence would not be allowed within 1/4 mile of active raptor nests; and surface disturbing and disruptive activities would be prohibited in identified crucial habitat for sensitive species, within 50 meters of identified white-tailed and black-tailed prairie dog towns, and within 1/4 mile of the perimeter of occupied greater sage-grouse and sharp-tailed grouse leks. In addition, high-profile structures would be prohibited within 1 mile of active greater sage-grouse and sharp-tailed grouse leks. These restrictions would offer the greatest protection for cultural resources because surface

disturbing and disruptive activities with the potential to disturb or displace cultural resources would not be allowed.

No new fences would be allowed in big game migration corridors, and water developments for livestock and wild horse use would not be allowed in crucial winter range. Cultural resources would be protected from disturbance and displacement caused by animal concentration and trailing in these areas. In addition, RCAs would be closed to new oil and gas leasing (18,400 acres), which would also provide indirect protections to cultural resources from disturbance associated with mineral developments.

Summary

Under Alternative 3, impacts to cultural resources would be similar to those impacts identified in Alternative 1. However, fewer acres would be disturbed, potentially impacting fewer cultural properties. It is anticipated that 13,214 acres would be disturbed over the life of the plan as a result of forest management, lands and realty management, and livestock management activities. This disturbance would potentially impact an estimated 456 cultural properties through displacement or loss.

In addition, 8,632 oil and gas wells would be drilled, disturbing approximately 56,000 acres. This disturbance would potentially impact an estimated 1,600 cultural properties in areas of high and moderate oil and gas potential. Those wells proposed on nonfederal lands where there is no federal involvement would adversely affect both the physical remains of cultural properties and the integrity of the setting where it contributes to NRHP eligibility, thus causing a significant impact. It is likely that fewer sites would be impacted by surface disturbance and disruptive activities than anticipated in Alternative 1.

Approximately 8,560 fewer acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SD/MAs, and NSO stipulations. These management actions would provide the greatest indirect protection to cultural resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. The VRM Class II areas would be increased to include 351,050 acres, resulting in the protection of a greater number of Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility. In addition, there would be more indirect protection to cultural resources because of the increase in surface restrictions included in management actions for other resource programs.

It is anticipated that significant impacts to cultural resources would occur. As discussed above, any surface disturbance has the potential to damage and/or destroy cultural properties potentially eligible for NRHP through unanticipated discoveries (i.e., cultural resources discovered during ground disturbing activities). Unanticipated discoveries result in the loss of some or occasionally all of the cultural resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing activities would protect most cultural resources from significant damage. Cultural monitoring in all sensitive areas would reduce the potential for significant impacts resulting from discovery situations. Because disturbance of fewer surface acres is anticipated, the potential for significant impacts would decrease as compared with Alternative 1.

4.3.5 Impacts Under Alternative 4: Proposed Plan

Impacts on cultural resources from air quality management; fire and fuels management; livestock grazing management; paleontology management; water quality, watershed, and soils; and wild horse management would be the same as those identified in Alternative 1.

Impacts resulting from cultural resource management would be the same as those identified in Alternative 1, except that surface disturbing activities would not be allowed within 1/4 mile or the visual

horizon, whichever is closer, of cultural properties where the setting contributes to the properties' NRHP eligibility. This would ensure the protection of those sites from activities that may compromise the values making them eligible.

Impacts to cultural resources from forest management would be similar to those identified in Alternative 1, except that 6,700 fewer acres would be available for commercial timber harvest. However, 7,000 acres would still be available for commercial and pre-commercial thinning and to fulfill Stewardship and Service Contracts associated with the Healthy Forest Restoration Act of 2003. The surface disturbance associated with these activities would potentially affect an estimated 241 cultural properties.

Impacts to cultural resources from lands and realty management would be similar to those identified in Alternative 1, except that 16,980 acres would be closed to locatable mineral entry and future disposal actions. This would result in closure of these areas to locatable mineral entry and future land disposal actions, which would provide additional protection to cultural resources located in these areas (an estimated 586 properties) by reducing surface disturbing and other disruptive activities and eliminating the possibility of placing undiscovered cultural resources outside of federal jurisdiction. Furthermore, an additional 14,780 acres would be precluded from disposal actions, reducing the number of cultural resources (an estimated 510 properties) that would be removed from federal jurisdiction. The area within 1/4 mile of the incorporated boundaries of cities/towns (1,500 total acres) would be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals. These stipulations would preclude surface disturbing and disruptive activities associated with minerals development and would indirectly protect cultural resources in these areas.

Impacts to cultural resources from oil and gas development would be similar to those identified in Alternative 1, except that less acreage would be open to oil and gas leasing, with greater constraints from other programs. Areas closed to leasing or otherwise restricted from development, surface disturbing and other disruptive activities, or surface occupancy would be increased. Overall, 8,822 wells would be drilled over the life of the plan, disturbing approximately 58,000 acres (including all related facilities and pipelines on federal and nonfederal lands). This would potentially affect an estimated 1,657 cultural properties located within those areas of high and moderate oil and gas potential (Map 4-7). Impacts to the trails from development located on federally administered lands or that are associated with federal actions would be mitigated through standard cultural resource identification and mitigation practices (Appendix 5). The decrease in development would decrease the potential for adverse impacts from unanticipated subsurface discoveries and trespass violations. However, fewer cultural resource inventories and site mitigations (e.g., excavations) would be required, which serve to expand the cultural resource database.

Impacts to cultural resources from OHV management would be similar to those identified in Alternative 1, except that an additional 23,350 acres would be closed to OHV use. This would eliminate the potential for damage to cultural resources associated with OHV use in these areas. In addition, offroad travel to retrieve big game kills or to access camping sites would be allowed only within 300 feet of existing roads.

Impacts to cultural resources from recreation management would be similar to those identified in Alternative 1, except that developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/4-mile area (7,930 acres) would be open to oil and gas leasing with an NSO stipulation. This would reduce the potential for damage to cultural resources in these areas by limiting the level of surface disturbing and other disruptive activities.

Impacts to cultural resources from management actions associated with the Shirley Mountain SRMA (37,820 acres), Continental Divide National Scenic Trail SRMA (600 acres), North Platte River SRMA

(5,060 acres), Jelm Mountain SRMA (18,100 acres), Pedro Mountains SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be similar to those identified in Alternative 3, except the Continental Divide National Scenic Trail SRMA, North Platte River SRMA, Jelm Mountain SRMA, and Pedro Mountains SRMA would not be closed to locatable mineral entry, which would increase the potential for damage to cultural resources in these areas by allowing for surface disturbing activities associated with locatable mineral development.

Impacts to cultural resources from management actions associated with the Como Bluff NNL (1,690 acres), Jep Canyon WHMA (13,810 acres), Shamrock Hills RCA (18,400 acres), Chain Lakes WHMA (30,560 acres), Laramie Peak WHMA (18,940 acres), Red Rim-Daley WHMA (11,100 acres), Pennock Mountain WHMA (7,770 acres), Wick-Beumee WHMA (280 acres), and White-Tailed Prairie Dog area would be similar to those in Alternative 1, except that surface disturbing and disruptive activities would be avoided in aspen communities within the Jep Canyon WHMA and intensively managed in the Chain Lakes area. This would provide additional protection from adverse effects to cultural resources in these areas by limiting the potential for discovery situations. In addition, impacts to cultural resources from intensive management of the unique desert wetland communities in Chain Lakes would be similar to those in Alternative 3.

Impacts to cultural resources from management of the WSR would be similar to those in Alternative 1, except that only the Encampment River segment would be suitable for inclusion. This would result in a smaller area where cultural resources would be indirectly protected from management actions associated with the WSR.

Impacts to cultural resources from management actions associated with the Sand Hills and JO Ranch Expansion ACEC (12,680 acres), Blowout Penstemon ACEC (17,050 acres), Upper Muddy Creek Watershed/Grizzly WHMA (59,720 acres), and Cow Butte/Wild Cow WHMA (49,570 acres) would be similar to those identified in Alternative 3, except the Blowout Penstemon ACEC, Upper Muddy Creek Watershed/Grizzly WHMA, and Cow Butte/Wild Cow WHMA would not be closed to locatable mineral entry, which would increase the potential for damage to cultural resources in these areas by allowing for surface disturbing activities associated with locatable mineral development. Furthermore, surface disturbing and disruptive activities would be avoided in aspen communities and near riparian and wetland areas within the Upper Muddy Creek Watershed/Grizzly WHMA and avoided in aspen and mountain shrub communities within the Cow Butte/Wild Cow WHMA. This would provide additional protection from adverse effects to cultural resources in these areas by limiting the potential for discovery situations. However, surface discharge of produced water would be allowed in the Upper Muddy Creek Watershed/Grizzly area. Erosion caused by surface discharge of produced water would potentially cause adverse affects to cultural resources located near the stream channel through displacement or loss.

The JO Ranch buildings (18 acres) within the Sand Hills and JO Ranch Expansion ACEC would be stabilized, and an interpretive program would be developed that would provide the cultural resource program with a venue for public education on the importance of cultural resources on the public lands. The VRM Class II area around the JO Ranch buildings would indirectly protect other cultural resources where setting is an important aspect of the integrity of the site.

Cultural resources would be protected from surface disturbing activities associated with timber harvesting, locatable mineral entry, and mineral material sales within the 240-acre Cave Creek Cave ACEC. Intensive management of oil and gas activities would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely effect buried cultural deposits located within the SD/MA. The Historic Trails area (66,370 acres) would be open to oil and gas leasing with an NSO stipulation and the Laramie Plains Lakes SRMA (1,600 acres) would also be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material sales, which would

preclude surface disturbing and disruptive activities that could potentially adversely affect cultural resources. Cultural resources would also be protected from other surface disturbing activities not associated with minerals development within the Historic Trails area.

Impacts to cultural resources from vegetation management would be similar to those identified in Alternative 3, except that vegetation and weed treatments (mechanical, biological, chemical, and prescribed fire) would be increased to include 828,460 acres over the life of the plan. An estimated 28,568 cultural properties would be involved in this area; however, only a small portion of these sites would be sensitive to vegetation treatment measures. Inventory and mitigation measures conducted in conjunction with vegetation treatments would protect sensitive cultural resources from significant damage.

Impacts on cultural resources from VRM management would be similar to those identified in Alternative 1, except that 2,040 fewer acres would be designated as VRM Class I, for a total of 66,120 acres. Cultural resources in those areas not managed as WSR segments would not receive the additional protections afforded VRM Class I areas. In addition, 8,560 fewer acres would be designated as VRM Class II for a total of 346,670 acres. As a result, a greater number Native American sacred sites, traditional cultural properties, and other cultural properties whose setting contributes to their NRHP eligibility would be protected from developments that would adversely affect the integrity of the setting for these types of sites (Appendix 5).

Impacts to cultural resources from wildlife and fisheries management would be similar to those in Alternative 1, except that surface disturbing and disruptive activities would be prohibited within 1/4 mile of the perimeter of occupied greater sage-grouse and sharp-tailed grouse leks. Cultural resources in these areas would be protected from activities with the potential to disturb or displace cultural resources.

Summary

Under Alternative 4, impacts to cultural resources would be similar to those impacts identified under Alternative 1. It is anticipated that 13,694 acres would be disturbed as a result of activities related to forest management, lands and realty management, and livestock management. This disturbance would potentially impact an estimated 472 cultural properties through displacement or loss.

In addition, 8,822 oil and gas wells would be drilled, disturbing approximately 58,000 acres. This disturbance would potentially impact an estimated 1,657 cultural properties in areas of high and moderate oil and gas potential—114 fewer than in Alternative 1. Wells proposed on nonfederal lands where there is no federal involvement would adversely affect both the physical remains of cultural properties and the integrity of the setting where it contributes to the NRHP eligibility, thus causing a significant impact.

Approximately 336,700 acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SD/MAs, and NSO stipulations. These management actions would provide the greatest indirect protection to cultural resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. The VRM Class II areas would be decreased to include 346,670 acres, resulting in the protection of a greater number of Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility. In addition, there would be more indirect protection to cultural resources from the increase in restrictions included in management actions for other resource programs.

It is anticipated that significant impacts to cultural resources would occur. As discussed above, any surface disturbance has the potential to damage and/or destroy cultural properties potentially eligible for the NRHP through unanticipated discoveries (i.e., cultural resources discovered during ground disturbing activities). Unanticipated discoveries result in the loss of some or occasionally all of the cultural resource

involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most cultural resources from significant damage. Cultural monitoring in sensitive areas would reduce the potential for significant impacts resulting from discovery situations. Because disturbance of fewer surface acres is anticipated, the potential for significant impacts would decrease as compared with Alternative 1.

4.4 WILDLAND FIRE AND FUELS

This section presents potential impacts on wildland fire and fuels management from management actions for other resource programs. Discussion of wildland fire and fuel management in this section relates only to wildland fire suppression and fuel reduction. Vegetative treatments (including prescribed burns and mechanical, chemical, or biological treatments) for nonfuel reduction objectives are discussed in Section 4.15. Existing conditions for fire and fuels management are described in Section 3.4.

Significance Criteria

Impacts to fire and fuels management would be considered significant if the following were to occur:

- Actions result in a substantial increased risk from wildland fire to public health and safety, other resource values, or destruction of property.
- Changes in vegetation communities result in increased size, complexity, and frequency of wildland fires.
- Management actions fail to reintroduce wildland fire into its natural role in the ecosystem.

Methods of Analysis

Impact analyses and conclusions are based on interdisciplinary team knowledge of resources and the project area as well as on a review of existing literature. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis was based on the following assumptions:

- A direct relationship exists between level of human use within the RMPPA and the frequency of human-caused fires.
- A direct relationship exists between fuel loads (standing and nonstanding vegetation) and potential fire size and intensity.
- BLM-administered land would be treated annually with prescribed fire, mechanical treatments, and chemical treatments. Additional acres would be treated annually with mechanical methods to reduce fire potential in wildland and urban interface areas.
- The chance of wildland fire within the RMPPA that could seriously damage sensitive resource values is considered to be moderate.
- Information on reasonably foreseeable developments (RFD) and RFAs can be found in Appendix 33.

4.4.1 Impacts Common to All Alternatives

Air quality regulations may preclude the use of wildland fire for resource benefit and hazard fuel reduction treatments on certain days when emission levels would be exceeded.

Protections afforded to cultural resources and surrounding areas (e.g., identified historical trails, buildings, and cultural sites) include limitations and restrictions related to fire management, which would

affect the methods of fire suppression. Altering containment lines and eliminating or reducing surface disturbance when removing burnable fuels would lead to an increase in the complexity of wildland fires and hazard fuel reduction treatments.

In the checkerboard and intermixed public and private lands, where AMR would most often result in suppression (Map 2-1), wildland fires would typically be kept to the smallest possible size. This would allow the buildup of fuels over time, which could lead to potential catastrophic wildland fires in the future. Vegetative mosaics of varying age classes, which occur as a result of wildland fire and which influence fire behavior, would be reduced. Wildland fire for resource benefit would be limited to areas where agreements with adjacent private landowners, the State of Wyoming, and other land management agencies could be reached. In these areas, wildland fire would be returned to its natural role in the ecosystem. Vegetative mosaics would be created that would limit future fire size and intensity. Individual fire size would increase, resulting in larger areas impacted by wildland fire. Fire frequency would decrease over time as the fuels necessary for combustion are removed. The emphasis on hazard fuel reduction treatments in the Wildland Urban Interface (WUI) would benefit suppression actions in those areas. Reductions in flame length and in the rate of spread of wildland fires in treated areas would increase firefighter and public safety. An increase in residential and industrial development in areas adjacent to public lands (WUI) would increase the need for hazardous fuel reduction and increase the frequency of fires from human causes. Opportunities to reintroduce fire into fire-dependent ecosystems would be reduced.

The harvest of minor wood products would reduce fuel loading in those areas. The reduction in fuel loading would decrease the complexity of suppression operations and increase firefighter and public safety but would increase ignition sources (e.g., chainsaws). Managing forests and woodlands to meet forest and rangeland health standards would reduce hazardous fuel accumulations. This would reduce the potential for catastrophic wildfires to occur.

The isolated public land parcels found within or near private lands would increase the amount and complexity of BLM's involvement in the suppression of fires, particularly in urban interface fires. However, BLM's involvement would be reduced as land tenure adjustments occur. Land tenure adjustments that create larger blocks of public land would benefit fire suppression and hazard fuel treatments by reducing the complexity of fire management actions. The establishment of transportation and utility ROWs would increase the potential for human-caused wildfires but allow for quicker response times along ROW access routes. In addition, ROWs generally contain less fuel because they are cleared of brush and trees when constructed, which potentially allows them to be used as containment lines.

Livestock grazing would decrease fine fuel loading (grass), which would reduce the rate of spread and therefore the size and complexity of wildland fires. In addition, livestock establish trails that could be improved for use as control lines. Range projects such as spring or well developments provide additional water sources that would be used during suppression operations. The management of livestock grazing to meet Wyoming Standards for Healthy Rangelands would maintain enough fine fuels to allow for the use of wildland fire for resource benefit, where appropriate. In addition, adherence to the Wyoming Standards for Healthy Rangelands would reduce the potential for conversion of healthy rangelands into those dominated by invasive species (e.g., cheatgrass, *bromus tectorum*), which greatly increases the frequency and complexity of fire management actions.

Mineral exploration and development would increase the complexity of fire management actions. The potential for human-caused wildland fires would increase as would the need to protect industrial interface areas. Road construction would provide improved access, and roads would be used as control lines during wildland fire suppression actions. The proliferation of roads in remote areas would increase fire

occurrence by introducing additional human-caused ignition sources. However, an improved road network would improve emergency vehicle access and enable an earlier response to fire ignitions.

OHV use would increase the potential for wildland fire ignition by OHV catalytic converters. However, proliferation of OHV trails would also increase the opportunity to use trails and vehicle routes as control lines during wildland fire suppression actions.

The impact from the management of paleontological resources would be similar to those associated with the management of cultural resources described above.

Increased recreation, such as camping and backpacking, would indirectly result in increased wildland fire ignition because of an associated increase in the number of ignition sources (e.g., campfires and catalytic converters). However, recreationists would assist the fire program by spotting and reporting wildland fires, which would improve response time and result in smaller fires. Increase in public land use would increase the frequency of human-caused fires and the need for fuel treatments in and adjacent to developed recreation sites.

The impact of SD/MAs on fire and fuels management would be similar to those impacts described for fire in the fire and fuels management discussion above. WSAs would be managed according to the Interim Management Policy (IMP). AMR would emphasize the use of wildland fire for resource benefit. Returning wildland fire as much as possible to its natural role in the ecosystem would increase the size of individual wildland fires and over time reduce the intensity of wildland fire. All other SD/MAs would be managed in conjunction with adjoining public, private, State of Wyoming, and other federally administered lands.

Transportation and access management would provide improved access and opportunities for roads to be used as control lines during wildland fire suppression actions. The proliferation of roads in remote areas would increase fire occurrence by introducing additional human-caused ignition sources. However, an improved road network would improve emergency vehicle access and enable an earlier response to fire ignitions.

Vegetation management actions to meet Wyoming Standards for Healthy Rangelands would result in a diversity of age class, cover, and fuel loads in all plant communities. This would reduce the size and intensity of wildland fires in the long term. In addition, adherence to the Wyoming Standards for Healthy Rangelands would reduce the potential for conversion of healthy rangelands into those dominated by invasive species (e.g., cheatgrass, *bromus tectorum*), which greatly increases the frequency and complexity of fire management actions. The location of threatened, endangered, proposed, and candidate species would potentially restrict hazardous fuels reduction and require additional actions to protect sensitive habitat. The presence of invasive and noxious species would potentially alter hazardous fuel treatments and increase the complexity of suppression activities.

Designated VRM classes I and II (Map 2-51) would potentially restrict hazardous fuels reduction, such as straight-line fire breaks, which would lead to an increase in fire size. VRM Class III and IV areas that allow for the use of a wider range of hazardous fuel reduction treatments could experience a reduction in the size and spread of wildland fires.

The rehabilitation of existing reservoirs and creation of additional water sources would improve suppression activities and aid in limiting fire size. The management of water and soil resources to meet the Wyoming Standards for Healthy Rangelands and Class 1 waters and waters with threats or impairments would reduce wildland fire size by providing a natural fire break of vegetation and water resistant to fire spread.

Impacts from wild horses would be similar to those described above for livestock management.

The management of threatened, endangered, proposed, and candidate species would restrict hazardous fuels reduction and require additional suppression actions to protect sensitive habitat in certain situations. For example, only 25 percent of Preble's meadow jumping mouse suitable habitat would be treated in each linear mile of habitat (Appendices 1, 10, and 15 and Biological Opinion). This would lead to unnatural fuel accumulations that would result in an increase in fire size and intensity and limit opportunities to reintroduce wildland fire into fire-dependent ecosystems.

4.4.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality; minerals; paleontology; recreation; OHVs; socioeconomics; visual resources; water quality, watershed, and soils; and wild horses would result in impacts similar to those under Impacts Common to All Alternatives above.

Cultural resource impacts would be similar to impacts described under Impacts Common to All Alternatives with the following additions. Restricting surface disturbing and disruptive activities within a 1/4 mile or the visual horizon, whichever is closer, of NRHP-eligible sites would restrict the use of hazardous fuels treatments. This would limit the construction of fire breaks, which would lead to an increase in fire size and intensity.

Fire and fuels impacts would be similar to those impacts under Impacts Common to All Alternatives with the following additions. AMR would occur on every acre, giving managers the flexibility to place wildland firefighting resources where they are most needed and to allow wildland fire to benefit other resources, when appropriate. Any fire suppression activities that result in a reduction in the size and intensity of wildland fire would increase the opportunity for larger, more intense fires. Areas designated as Use of Wildland Fire (Map 2-1) would benefit from having wildland fire function in its natural ecological role. Impacts would be similar to those described for Wildland Fire for Resource Benefit under Impacts Common to All Alternatives above. An estimated 4,000 acres of wildland fire occurring annually would not achieve the goal of reintroducing fire into fire-dependent ecosystems. Vegetation communities that continue to age without the benefit of wildland fire reintroduced into fire-dependent ecosystems would increase amounts of decadent brush and forest, thereby increasing wildland fire size and intensity.

The harvest of minor wood products would reduce fuel loading in those areas. The reduction in fuel loading would decrease the complexity of suppression operations and increase firefighter and public safety but would increase ignition sources (e.g., chainsaws). Managing forests and woodlands to meet forest and rangeland health standards would reduce hazardous fuel accumulations. This would reduce the potential for catastrophic wildfires to occur. A reduction in the amount of dead and downed forest fuels resulting from insect damage, disease, and blow down would achieve forest health objectives and reduce the frequency, size, and intensity of wildland fire. Forest management actions that reduce conifer encroachment in aspen communities also would reduce the frequency and intensity of wildland fire. Commercial timber harvest methods that create fuel breaks would reduce the size of wildland fires but also would increase ignition sources. In the long term, achievement of forest health and a diverse mosaic of vegetation age classes within forest communities would reduce the size and intensity of wildland fires.

Lands and realty-related impacts would be similar to those described under Impacts Common to All Alternatives above. Disposal of any of the approximately 61,010 acres available for sale or exchange would reduce suppression responsibilities in portions of the RFO containing only isolated public lands. Reducing the fragmented public land ownership pattern in some areas would allow for an increase in fire

size and use of wildland fire for resource benefit. The need to suppress wildland fires to their smallest possible size to protect adjacent private property would be reduced.

Livestock grazing impacts would be similar to those described under Impacts Common to All Alternatives above. In addition, livestock grazing systems and range improvements that use pasture rest and deferment to improve herbaceous plant vigor, health, and production would lead to increases in herbaceous plant material that would influence the size and spread of wildland fires. However, when pastures are grazed under various grazing strategies, the use would reduce those same herbaceous fuels that would carry a wildland fire.

Impacts from SD/MAs would be similar to those described under Impacts Common to All Alternatives with the following additions. SD/MAs with objectives that would limit fire size by emphasizing suppression to protect or enhance their unique values and sensitive resources would result in smaller fires. This includes the following SD/MAs: Sand Hills ACEC and JO Ranch, Jep Canyon ACEC and Wildlife Habitat Management Area (WHMA), Shamrock Hills ACEC, Stratton Sagebrush Steppe Research Area ACEC, Chain Lakes Potential ACEC, Laramie Peak Potential ACEC, Red Rim-Daley Potential ACEC, Cave Creek Cave Potential ACEC, Laramie Plains Lakes Potential ACEC, Blowout Penstemon Potential ACEC, and Upper Muddy Creek Watershed/Grizzly Potential ACEC. In addition, all eligible river segments for WSR designation would be managed to protect their outstandingly remarkable values, free-flowing nature, and tentative classification. Management of these segments with measures such as designated VRM Class I (Map 2-51) would potentially restrict hazardous fuels reduction, such as straight-line fire breaks, which would lead to an increase in fire size.

Impacts from transportation and access would be similar to those described for lands and realty above with the following additions. The lack of restrictions on road densities would create additional opportunities for suppression while restricting opportunities to reintroduce wildland fire into fire-dependent ecosystems by creating barriers that reduce fire size.

Impacts from vegetation management would be similar to those described under Impacts Common to All Alternatives with the following additions. Over the long term, however, the amount of acres designated for treatment under this alternative (2,500 acres, not including invasive weed treatments) would not be adequate to create the diversity of seral stages necessary for long-term vegetation health. This would result in the majority of plant communities being in late seral stages, with large areas of overmature and decadent vegetation, thereby increasing the potential for wildland fires to occur. The emphasis on control of noxious species would allow the natural wildland fire return interval to be reestablished in areas where the AMR would emphasize the use of wildland fire for resource benefit. However, the limited number of acres treated for noxious and invasive species would not reduce the frequency and size of wildland fires. In addition, the continued proliferation of invasive species such as cheatgrass would greatly increase the size, frequency, and complexity of fire and fuels management. The location of species listed on the BLM State Director's Sensitive Species List would potentially restrict hazardous fuels reduction and require additional suppression actions to protect sensitive habitat.

Impacts from wildlife and fish decisions would be similar to those described under Impacts Common to All Alternatives but with additional timing restrictions for activities disruptive to wildlife species. These restrictions would potentially impact hazardous fuels reduction and the use of wildland fire for resource benefit by limiting when those activities would occur. For example, habitat management of greater sage-grouse and sharp-tailed grouse would influence the time, size, and location of hazardous fuels reduction projects and the use of wildland fire for resource benefit, thus limiting the opportunity to reintroduce wildland fire into fire-dependent ecosystems. Specific vegetation goals for wildlife species habitat would be considered during decisions for allowing wildland fire to be used for resource benefit, or when considering whether suppression is the appropriate response. The species listed on the BLM State

Director's Sensitive Species List would potentially restrict hazardous fuels reduction and require additional suppression actions to protect sensitive habitat.

Summary

Increases in public land use and development under minerals and transportation and access management would increase the potential for large, human-caused wildland fires to occur. However, a greater emphasis on fire prevention, suppression, and fuels management, especially in WUIs, would moderate this increase. Also, roads and pipelines associated with increased development would improve access for fire crews, create fuel breaks, and provide fire control lines when backfired in suppression situations.

Using wildland fire for resource benefit would allow for the reintroduction of fire into fire-dependent ecosystems, which would reduce large fire suppression efforts over the long term. However, an estimated 4,000 acres of wildland fire occurring annually would not achieve the goal of reintroducing fire into all fire-dependent ecosystems.

Vegetation treatments applied under this alternative would not be adequate to create the diversity of seral stages necessary to decrease the potential for wildland fires. The limited number of acres treated for noxious and invasive species would not reduce the frequency and size of wildland fires. In addition, the continued proliferation of invasive species such as cheatgrass would greatly increase the size, frequency, and complexity of fire and fuels management.

4.4.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality; minerals; OHV; paleontology; recreation; socioeconomics; water quality, watershed, and soils; and wild horse management would result in impacts similar to those described under Impacts Common to All Alternatives.

Cultural and livestock grazing management actions would result in impacts similar to those described under Alternative 1.

Emphasis on suppression of all wildland fires would reduce the amount of acreage burned each year (an estimated 2,000 acres per year). However, minimizing the use of wildland fire for resource benefit would increase large fire suppression efforts. Also, the emphasis on fire suppression would increase the need for, and complexity of, rehabilitation and restoration efforts of fire suppression-related disturbance. Additional impacts are described under the Impacts Common to All Alternatives section above.

Forest management impacts would be similar to those described under Alternative 1 but without offering the benefit of using natural processes to achieve forest health objectives. The inability to use wildland fire for resource benefit would exacerbate unnatural fuel loading in forests, which would lead to an increase in wildland fire size and intensity.

Impacts from lands and realty-related consolidation or disposal of isolated public land would be similar to Alternative 1. The benefits to fire suppression and fire use would be realized only in response to the exchange or disposal of 46,230 acres.

Impacts from SD/MAs would be similar to those in Alternative 1, but all eligible river segments for WSR designation (140 miles) would not be managed to protect their outstandingly remarkable values, free-flowing nature, and tentative classification.

Transportation and access would have impacts similar to those in Alternative 1. In addition, acquisition would not be pursued in any order of priority. This would potentially limit access for conducting hazardous fuel reduction projects.

Vegetation treatments would result in impacts similar to those described in Alternative 1 with the following addition. The increase in landscape-scale vegetation treatments (24,400 acres per year) would create more diverse mosaics of vegetation communities in treated areas and reduce the size and intensity of wildland fires. Species listed on the BLM State Director's Sensitive Species List would not be protected and therefore would not restrict hazardous fuels reduction or require additional suppression actions to protect sensitive habitat. A reduction in the proliferation and expansion of noxious and invasive species (e.g., cheatgrass) where large weed patches influence commodity production would improve native vegetation vigor and production and return treatment areas to a more natural wildland fire frequency and intensity. However, the acres of noxious and invasive weeds treated would not completely eliminate the increased fine fuels and rapid fire spread rates caused by proliferation of weeds in the short term. A long-term program of treatment of weed patches that affect commodity production or value would eventually result in the maintenance of native plant communities and natural wildland fire frequency, size, intensity, and return intervals.

Designated VRM Classes I and II (Map 2-52) would potentially restrict hazardous fuels reduction (such as straight-line fire breaks), which would lead to an increase in fire size. Visual resource impacts would be similar to those impacts described under Alternative 1, although fewer acres would be influenced by VRM Class I and II surface disturbance restrictions. A wider range of hazardous fuel reduction treatments could be used to reduce the size and spread of wildland fires in VRM Class III and IV areas.

The management of threatened, endangered, proposed, and candidate species would restrict hazardous fuels reduction and require additional suppression actions to protect sensitive habitat in certain situations. With fewer protections for wildlife species, there would be fewer restrictions on fuels reduction projects and the use of wildland fire for resource benefit. However, emphasizing suppression would lead to unnatural fuel accumulations that would result in an increase in fire size and intensity and limit opportunities to reintroduce wildland fire into fire-dependent ecosystems over the long term.

Summary

AMR with an emphasis on suppression, when coupled with the approximately tenfold increase in vegetation and weed treatments, would reduce the annual size of wildland fires to an estimated 2,000 acres. However, the emphasis on fire suppression of all wildland fires under this alternative, and the associated reduction in acreage burned each year, would limit the reintroduction of wildland fire into fire-dependent ecosystems.

4.4.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality; minerals; paleontology; recreation; socioeconomics; water quality, watershed, and soils; and wild horses would result in impacts similar to those listed in Impacts Common to All Alternatives above.

Cultural, livestock grazing, and OHV management actions would result in impacts similar to those in Alternative 1.

Impacts from fire and fuels management would be similar to those in Alternative 1 with the following difference. The emphasis on the use of wildland fire for resource benefit would increase the

reintroduction of fire into fire-dependent ecosystems (8,000 acres per year) and would minimize large wildland fire suppression efforts.

Impacts from forest management actions would be similar to Alternative 1 with the following additions. Management of forestlands with an emphasis on natural processes would reintroduce wildland fire into more fire-dependent forest ecosystems. In addition, the lack of commercial timber harvest under this alternative would require increased hazardous fuels reduction and forest health treatment efforts.

Impacts associated with lands and realty actions would be similar to those in Alternative 1. However, with new closures to facility placement (497,080 acres) and locatable mineral entry (271,110 acres), there would be fewer access roads and a decrease in human-caused ignitions.

OHV impacts would be similar to those in Alternative 1, but the additional restrictions on locations where OHVs would be driven would produce fewer human-caused fires.

SD/MAs would result in impacts similar to Alternative 1 with the following additions. The Stratton Sagebrush Steppe Research Area ACEC would use wildland fire suppression to meet the needs of research. This would increase the complexity of fire and fuels management. The Blowout Penstemon ACEC would be managed for an early seral stage, which would require additional fuels management as well as the opportunity to allow wildland fires to become larger in size. In addition, all eligible river segments would be designated as WSRs to protect their outstandingly remarkable values, free-flowing nature, and tentative classification. Management of these segments with measures such as designated VRM Class I (Map 2-49) would potentially restrict hazardous fuels reduction, such as straight-line fire breaks, which would lead to an increase in fire size. In addition, those portions of the Encampment River administered by BLM, including those in the Encampment River Canyon WSA, would be managed for AMR with an emphasis on suppression. This would include areas 1/4 mile on either side of the 100-year high-water mark. This action is to protect a municipal water supply.

Transportation and access impacts would be similar to those described under lands and realty above. However, by controlling road density, fewer opportunities would exist for improved access and use of roads as fire control lines.

Impacts from vegetation management would be similar to those in Alternative 1 with the following additions. Vegetation treatments (11,800 acres, plus those acres receiving weed treatments) to achieve DPC would result in increased complexity to fire and fuels management. However, because of the large number of smaller treatments, the increase in the mosaic vegetation patterns would not be adequate to slow the spread of wildland fires, or to reduce potential fire size and intensity. Management actions aimed at achieving native weed-free plant communities would reduce the potential for wildland fire ignition and spread over the long term. However, plant communities with established populations of noxious and invasive species could alter natural wildland fire frequency, size, and intensity and could increase the complexity of wildland fire management in the short term.

Visual resource impacts would be similar to impacts under Alternative 1 but with more acres under restriction in terms of disruptions to the viewshed would limit the use of surface disturbing fire prevention and suppression activities. This would potentially increase the size of individual fires.

Wildlife management impacts would be similar to impacts under Alternative 1 but with increased restrictions on fuels management activities (i.e., timing, increased areas of protection, and surface restrictions on raptor nests, big game parturition areas, T&E species habitat, and greater sage-grouse and sharp-tailed grouse leks, etc.) that would potentially reduce the window of opportunity to conduct fuels management activities and use wildland fire for resource benefit.

Summary

Vegetation treatments (11,800 acres, plus those acres receiving weed treatments) to achieve DPC would increase the complexity of fire and fuels management. In the short term, vegetation treatments would not be adequate to reduce potential fire size and intensity. Over the long term, the emphasis on the use of wildland fire for resource benefit would achieve the goal of reintroduction of wildland fire into fire-dependent ecosystems. Management actions aimed at reducing the spread of noxious and invasive species (e.g., cheatgrass) would reduce the potential for fire ignition and spread over the long term. However, plant communities with established populations of noxious and invasive species could alter natural wildland fire frequency, size, and intensity in the short term.

4.4.5 Impacts Under Alternative 4: Proposed Plan

Air quality; minerals; paleontology; recreation; socioeconomics; water quality, watershed, and soils; and wild horses would result in impacts similar to those described under Impacts Common to All Alternatives.

Cultural resource and livestock grazing management actions would result in impacts similar to those under Alternative 1.

Transportation and access as well as visual resource actions would result in impacts similar to those under Alternative 3.

Fire and fuels management actions would result in impacts similar to those described under Alternative 1 but with greater emphasis on the use of wildland fire for resource benefit and an increase in vegetation treatments (an estimated 16,400 acres per year, not including weed treatments) would reintroduce wildland fire into fire-dependent ecosystems. This would create more diverse vegetation communities and reduce the size and intensity of wildland fires.

Impacts from forest management activities would also be the same as in Alternative 1, except that 6,700 fewer acres being available for commercial timber harvest would increase the possibility of wildland fire. Also, greater emphasis on the use of wildland fire for resource benefit and an increase in vegetation treatments (an estimated 16,400 acres/year, not including weed treatments) would reintroduce wildland fire into fire-dependent forest ecosystems. This would create more diverse vegetation communities and reduce the size and intensity of wildland fires.

Impacts from lands and realty related consolidation or disposal of isolated public land would be similar to those in Alternative 1. The benefits to fire suppression and fire use would be realized only in response to the exchange or disposal of 46,230 acres.

OHV impacts would be similar to those in Alternative 1. However, with the additional restrictions on offroad travel for accessing camping sites and recovering big game kills and with the additional acreage being limited to designated roads and vehicle routes, OHVs would produce fewer human-caused fires.

Impacts from SD/MAs would be similar to those described under Alternative 3. In addition, Jep Canyon WHMA, Shamrock Hills RCA, Chain Lakes WHMA, Laramie Peak WHMA, and Red Rim-Daley WHMA would be managed in association with adjoining private and state lands. AMR would most often result in suppression that would result in smaller, less intense fires in the short term. All eligible river segments for WSR designation would not be managed to protect their outstandingly remarkable values, free-flowing nature, and tentative classification, with the exception of the Encampment River segment (2.51 miles). Impacts to this segment would be the same as in Alternative 3.

Impacts from vegetation management would be similar to those in Alternative 3 but with the following additions. Vegetation treatments (16,400 acres, plus those acres receiving weed treatments) would result in a increased complexity to fire and fuels management. Because of the larger size of treatments, the increase in the mosaic vegetation patterns would be adequate to slow the spread of wildland fires and reduce potential fire size and intensity. Management actions aimed at reducing the spread of noxious and invasive species (e.g., cheatgrass) would reduce the potential for wildland fire ignition and spread over the long term.

Wildlife and fisheries impacts would be similar to those described under Alternative 3. Timing restrictions for activities disruptive to wildlife species would impact hazardous fuels reduction by limiting when those activities would occur. For example, surface disturbing and disruptive activities in big game winter range would not be allowed during the period of November 15 to April 30. Surface disturbing and disruptive activities in aquatic habitats for the protection of amphibians would potentially restrict hazardous fuels reduction from occurring, thereby increasing the size and potential for catastrophic wildland fires. Habitat management of greater sage-grouse and sharp-tailed grouse would influence the time, size, and location of hazardous fuels reduction projects and the use of wildland fire for resource benefit, thus increasing the size and intensity of wildland fires over the long term.

Summary

The greater emphasis on the use of wildland fire for resource benefit and the increase in fuels treatments (16,400 acres, not including weed treatments) would result in reintroducing wildland fire into many fire-dependent ecosystems. Management actions aimed at reducing the spread of noxious and invasive species (e.g., cheatgrass) would reduce the potential for fire ignition and spread over the long term.

Increases in public land use and development under minerals and transportation and access management would increase the potential for large, human-caused wildland fires to occur. However, a greater emphasis on fire prevention, suppression, and fuels management, especially in WUIs, would moderate this increase. Also, roads and pipelines associated with increased development would improve access for fire crews, create fuel breaks, and provide fire control lines when backfired in suppression situations.

4.5 FOREST MANAGEMENT

This section presents potential impacts to forest management from management actions for other resource programs. Potential impacts to forest vegetation are presented in the Vegetation section (4.15). Existing conditions concerning forest resources and their management are described in Section 3.5.

Significance Criteria

Impacts on forests would be considered significant if any of the following were to occur:

- Management actions create substantive changes in forest health values.
- Management actions substantially alter the ability to harvest timber or minor wood products (i.e., post and pole, Christmas trees, firewood, and wildlings).

Methods of Analysis

Impact analyses and conclusions are based on interdisciplinary team knowledge of resources and the project area as well as on a review of existing literature. Effects are quantified where possible using field investigations, aerial photography, and geographic information systems. In the absence of quantitative data, best professional judgment was used. Impacts are described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis was based on the following assumptions:

- In all areas that have been designated for forest health and fire fuels reduction treatments, 40 percent of the wood product material would be harvested by thinning, 40 percent would be removed through fire fuels reduction (i.e., prescribed fire and the mechanical removal of any fire hazardous fuel products), and less than 20 percent would be harvested by means of clear-cut.

- Clear-cut areas would be revegetated within 5 to 7 years after harvest. Temporary roads would be revegetated within 3 to 5 years after closure. No new permanent roads would be constructed for forest management, but some roads would be temporarily improved to allow for forest product removal.

- Management practices would include removal of encroaching conifers from aspen stands to release the stand and improve aspen stand health in some locations. Most woodlands (see “Woodland” in the glossary) would continue in succession until disturbed by natural causes.

- RFDs and RFAs can be found in Appendix 33.

4.5.1 Impacts Common to All Alternatives

Air quality, minerals, paleontology, socioeconomics, and wild horse management actions would have little or no impact on forest health management actions.

There would be no impacts to forest health management actions from SD/MAs other than for the Cave Creek Cave area and the Shirley Mountain SRMA.

Modification of forest management actions (application of cultural BMPs, etc.) that might diminish the integrity of a cultural property’s setting or incorporation of protective measures for Native American sacred or sensitive sites would potentially influence the type, size, and location of a forestry project or

treatment as well as the amount of forest product that would be removed from an identified area. Forest thinning projects or commercial harvest would potentially be modified if a known NRHP-eligible cultural resource site were present. In rare cases, a forest management project would be precluded if redesign or other mitigation measures were not adequate. These actions under cultural resources would have little or no impact the overall forest health management program.

Any wildland fire management response that results in wildland fire suppression would preserve forest products for potential commercial or noncommercial use by the public. Fuel treatments, including prescribed fire, mechanical, chemical, and biological treatments within or adjacent to forest or woodland WUI areas, would provide the opportunity for commercial forest product removal to meet both WUI objectives and forest health objectives including returning fire to its natural role in the ecosystem. Fire management actions developed and implemented in conjunction with forest health management actions would combine to reduce hazardous fuels overloading on forestlands as well as reintroduce fire into fire-dependent ecosystems. Rehabilitation and restoration efforts specific to a wildland fire event would help stabilize bare ground and return appropriate forest species to the disturbed site. These actions would have a moderate impact on forest health by contributing to the development of both a spatial mosaic and vertical age class distribution of the forest landscape and would promote improved stand vigor as well as reduce hazardous fuels and stand overloading while making forest products available to the public.

All forest and woodlands would be managed to meet the objectives of the Healthy Forest Initiative (TITLE I—Hazardous Fuel Reduction on Federal Land, pp. 3–15) (TITLE IV—Insect Infestation and Related Diseases, pp. 22–26) and Healthy Forest Restoration Act of 2003 as well as Wyoming Standards for Healthy Rangelands (1997) to restore forest health, stand stability, and age-class distribution to unhealthy forests and woodlands. All forest and woodlands (196,934 acres), with the exception of WSAs (66,120 acres) and developed recreation sites, would be open to the harvest of minor wood products, such as fuelwood, posts and poles, Christmas trees, wildings, and special forest products (burl and character wood) by the general public. Noncommercial harvesting of minor wood products by the general public would contribute to increased soil erosion/compaction (on and off designated roads and vehicle routes), creation of new two-tracks, and fire fuel loading from slash as well as short-term loss of vegetation. There would also be an increase in wildfire ignition potential from campfires, chainsaws, OHVs, and hauling vehicles that the general public would use to conduct these harvests.

Forest health management actions such as stewardship/service, noncommercial thinning, and hazardous fire fuels reduction projects would be implemented to reduce stand overstocking in immature stands and hazardous fire fuel loading created from disease and insect outbreaks (i.e., pine beetles, dwarf mistletoe, and white pine blister rust), old and decadent stands, and from slash associated with minor wood product harvest by the general public. These actions would reduce the potential for catastrophic wildfire events and improve overall forest stand health, vigor, and production. Forest and woodlands management actions would be implemented to manipulate aspen, juniper, limber pine, and other noncommercial tree species to improve stand health and meet other multiple-use objectives, such as wildlife habitat improvement. These actions would have significant impact on forest health management by contributing to the development of noncommercial forest and woodlands, creating a spatial mosaic and vertical age class distribution of the forest landscape, and promoting improved stand vigor as well as reducing hazardous fire fuel and stand overloading while making forest products available to the public.

The entire RMPPA would be open to livestock grazing. Livestock management actions would include the implementation of the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which requires meeting standards for vegetation health, wildlife habitat, and riparian habitat.

Livestock grazing would decrease competition from herbaceous plants that compete with tree seedlings for water, sunlight, and nutrition. In open harvest or treatment sites, livestock would also trample the

topsoil and spread manure, thus contributing to the early success and growth of a forest stand in these areas. In areas where livestock concentrate, there would be an increase in the grazing of tree saplings and seedlings in regenerating harvest or treatment sites, causing the trees to grow in a bush-type manner with stunted or stagnant growth. This would potentially lead to the production of an unhealthy forest stand. This also would make the trees weak and susceptible to disease and insect attacks as well. This has little effect on the growth and production of the overall forest landscape. In areas outside of harvest or treatment regeneration sites, the impact would be moderate to low.

A goal of the OHV management program is to prevent or mitigate resource damage caused by OHV use, which would help limit the number of newly created two-tracks in forested areas not suitable for OHV use. The creation of new two-tracks would cause the temporary loss of forest ground cover (such as forbs/grasses, seedlings, and saplings) and contribute to increased soil compaction and erosion in forested areas; however, these impacts would have a low or negligible effect on the overall forest landscape.

The removal of forest products from developed recreation sites, such as Prior Flat Campground, would be limited to activities that lessen hazardous fuel loadings or address public safety concerns (e.g. dead tree removals). Because recreational sites are generally small and not heavily forested, there would be little impact on commercial or noncommercial harvest of forest products. Recreational pursuits in forested areas are generally compatible with most forest management activities, including forest health objectives and some forms of timber harvesting. Recreationists would potentially be displaced temporarily from or forced to avoid areas of treatment or harvest activity because of alteration of the visual appearance of the forest landscape, chainsaw noise, and road traffic. In areas not set aside for recreational use, the impact would be low or negligible.

The pursuit of land tenure adjustments within the Shirley Mountain SRMA would create a better opportunity to apply forest health management actions. Ponderosa pine stands in the Pedro Mountains would be managed with a restriction on commercial and noncommercial forest product removal, which would have no impact because of the inability to access and harvest forest products in the area.

Actions associated with SD/MA management would have little to no impact on the overall forest health management program. Commercial forest product harvest activities adjacent to the Cave Creek Cave location would be designed in a manner that would not affect water temperature going into the cave.

WSAs (Map 2-6) would be managed according to the Interim Management Policy for Lands Under Wilderness Review, until Congress either designates each WSA as “wilderness” or releases it from consideration and it reverts to multiple-use land. All forest and woodlands within WSA areas would be closed to any type of commercial forest product harvesting but would be open to forest health management treatments that do not require the use of mechanical equipment. The use of prescribed natural wildland fire as a forest management tool would reduce hazardous fire fuel loading and promote diversity in stand age class distribution as well as improved forest health. Without periodic disturbance, stands would overstock, stagnate, and develop poor health, thereby creating the potential for insect and disease outbreaks, hazardous fire fuels overloading, and catastrophic wildfire events. Actions associated with WSA management would have little to no impact on the overall forest health management program.

Under vegetation management, aspen stands would be managed to achieve the objectives of the Healthy Forest Initiative (TITLE I—Hazardous Fuel Reduction on Federal Land, pp. 3–15) (TITLE IV—Insect Infestation and Related Diseases, pp. 22–26) and Healthy Forest Restoration Act of 2003 as well as Wyoming Standards and Guidelines for Healthy Rangelands (USDI, BLM 1997). Forest health treatments would be designed to remove hazardous fire fuel loading and stem conifer encroachment as well as remove decadent and diseased clones from aspen stands, thereby allowing young, vigorous, and healthy clones to be released to thrive and grow and potentially increasing the overall health of aspen stands over

the long term. These actions under vegetation resource management would have a moderate to low impact on the overall forest health management program.

Forest health management activities would be designed to avoid unstable areas, such as landslides, slopes of greater than 25 percent, slumps, and areas exhibiting soil creep, and would avoid identified 100-year floodplains, areas 500 feet from perennial surface water and/ or wetland and riparian areas, and areas 100 feet from ephemeral channels. Riparian buffer zones and steep slope area restriction would potentially limit the size of a forest product harvest or restrict an area from potential harvest. Actions under water quality, watershed, and soil resources would have a low impact on the overall forest health management program.

All forest health management actions would potentially be modified to comply with wildlife stipulations and restrictions to minimize disturbance as well as to maintain connectivity between large contiguous blocks of wildlife and raptor habitat, especially identified habitat of T&E species. Forest health management actions would be designed not only to promote and enhance forest health but also to promote and enhance healthy wildlife habitat. NSO/Controlled Surface Use (CSU) stipulations of 825 feet would be placed around all identified raptor nesting sites, such as for goshawks (1,200 feet for ferruginous hawks), within a forest project or treatment area. However, doing so would lessen the size as well as the amount of forest product that would be removed from a project or treatment area. Forest management areas that fall within the 1/2-mile no-surface-disturbance radius of an active bald eagle's nest would potentially be restricted from all forest health management actions during the time period from February 1 to August 15. Such restrictions and timing stipulations from wildlife management on forest health management actions would allow for excess hazardous fire fuel buildup and would contribute to insect and disease outbreaks in the isolated forested areas as well as allow for shorter treatment implementation time and harvest windows. This would also contribute to fewer forest acres being treated and to lower forest product quantities being harvested during projects for forest product removal and/or treatment in these identified areas. In times of drought, harsh winters, and low forage production, big game species, such as elk, tend to feed on young seedlings and saplings in regenerating harvest and/or treatment areas, potentially causing trees to grow in a bush-type manner with stunted or stagnant growth that would lead to the production of an unhealthy forest stand. Although this makes the trees weak and susceptible to disease and insect attacks, it has little effect on the growth and production of the overall forest landscape, and its impact is low in areas outside of regenerating harvest or treatment sites. T&E and BLM sensitive species habitat, such as for the boreal toad, would heavily restrict forest management activities in that area to protect significant habitat. This would also potentially reduce the number of harvest and/or treatment acres as well as forest product harvest quantities. Actions associated with the management of the overall wildlife and fisheries program would have moderate to low impacts on forest health management.

4.5.2 Impacts Under Alternative 1: Continuation of Existing Management

Impacts on forest resources from air quality, minerals, OHV, paleontology, socioeconomics, and wild horse management would have little or no impact on forest health management actions.

In areas of cultural concern, any area within 1/4 mile of a cultural property or the visual horizon, whichever is closer, would be an avoidance area for surface disturbing activities, if the setting contributes to NRHP eligibility. Modification of forest management actions (application of cultural BMPs, etc.) that might diminish the integrity of a cultural property's setting or incorporation of protective measures for Native American sacred or sensitive sites would potentially influence the type, size, and location of a forestry health project or treatment as well as the amount of forest product that would be removed from an identified area. Forest health treatments, noncommercial and commercial thinning projects, and hazardous

fire fuels reductions as well as commercial harvests would potentially be modified if a known NRHP-eligible cultural resource site were present. In rare cases, a forest management project or treatment would be precluded if redesign or other mitigation measures were not adequate. Forest health management actions conducted near or adjacent to these areas would be constructed to protect cultural resources and would abide by all cultural laws and/or restrictions that apply.

Wildland fire suppression activities would be managed for AMR. Suppression actions associated with wildland fire would increase the potential for hazardous fuels loading; they would also protect forest product stands that are of commercial value. There would be an increased need for forest health management actions including but not limited to thinning projects (both commercial and pre-commercial), prescribed burns, and commercial harvest to assist in the reduction of hazardous fuels as well as to create fuel breaks within forested areas. Fire and forest management actions would be designed to work together to promote forest health and stand vigor as well as reintroduce fire back into fire-dependent ecosystems. Wildland fire for resource benefit would be used to protect, maintain, and enhance resources and, as nearly as possible, allow fire to function in its natural ecological role. Fire would consume duff to expose bare soil for seeds while, at the same time, the heat produced from the fire would stimulate serotonins pine cones (such as Ponderosa and lodgepole pine), allowing them to release the seeds. However, if the fuel loading is too great, the heat from the fire would be too intense and cause damage to the soil as well as cause a potential long-term loss of vegetation.

There are roughly 28,500 acres of identified commercial forest lands (the majority being located in the Shirley Mountain area) within the RMPPA. Of those 28,500 acres identified as commercial forest lands, 6,700 acres are identified as riparian buffer zones and steep slopes. The allowable harvest level is about 10 million board feet (MMBF) per decade (although the current level is somewhere between 350 thousand board feet [MBF] and 550 MBF because of the current decline in the forest product industry in the State of Wyoming).

The condition of the commercial forest stands would improve over the long term because mature and overmature stands would be removed and replaced with younger, healthier stands. The dominant tree species is lodgepole pine. Clear-cuts are the most feasible commercial forest product harvest method because of the need of the lodgepole pine for open bare ground and for the large amounts of heat from the sun, or from alternative sources such as fire, that are required to open its serotonins cones to release seeds for germination. Another reason why clear-cuts are the most feasible is that the lodgepole pine's shallow root systems tend to allow the trees to blow over in high-wind conditions, causing a buildup of hazardous fire fuels on the forest floor when spaced too widely apart. However, there are several other silvicultural practices available (Appendix 19, Forestry) (Section 3.5.1 and Map 3-1).

The decline in local demand for saw timber has directly reduced timber harvests and is expected to continue over the long term. Because of this decline, forest management actions would focus on improving forest health to meet ecological objectives rather than commercial forest product production. Over the next 100 years, the nonharvested commercial forestland would continue to follow a natural succession with a potentially increased likelihood of insects, disease, and wildland fire outbreaks as well as stagnation problems. These harvest level reductions would contribute to the overgrowth of forest stands and buildup of hazardous fire fuels, thus creating the need for alternative management actions, such as stewardship/service, hazardous fire fuels reduction, thinning, and forest health improvement projects. Implementation of such projects would contribute to the reduction of hazardous fire fuels levels, forest stand stagnation and overgrowth, and conifer encroachment into aspen stands as well as the potential for a catastrophic wildland fire event. These alternative management actions, if implemented, would also contribute to improved stand spacing, health, vigor, and age class distribution, which are key in controlling wildland fire, insect, and disease outbreaks.

Through thinning and improved stand spacing, which opens up the tree crown canopy, allowing rain and sunlight to reach and promote the growth of grass and forbs on the forest floor, forage for wildlife would be greatly increased. These actions would have significant impact on forest health management by contributing to the accomplishment of multiple-use management objectives and the development of both commercial and noncommercial forest and woodlands to create a spatial mosaic and vertical age class distribution of the forest landscape and promote improved stand vigor as well as reduce hazardous fire fuel and stand overloading while making forest products available to the public (see Long-Term [100 Years] Age-Class Redistribution of Lodgepole Pine Under Current Management Table in Appendix 19, Forestry; Stand Development section).

Under lands and realty management, before taking any disposal action, consideration would be given to each individual tract and would include public involvement (Appendix 6). The preferred method of disposal, consolidation, or acquisition of lands by BLM would be through exchange. Pursuing access to Shirley Mountain, Elk Mountain, Arlington, and Little Medicine through ROWs and/or land exchange (Appendix 7) would increase the ability to apply forest health management actions to BLM-administered forest lands in isolated areas to control insect and disease outbreaks and reduce hazardous fire fuels loading. Individual problem areas would more likely be treated in a timely manner, improving the overall health of the forest landscape. Access into these areas would also allow for increased opportunities for the removal of commercial forest products. Communications sites, such as cell phone towers, are sometimes constructed within forested areas and would cause long-term loss of forest vegetation at the site of the tower as well as of the access road. Location of new communication sites would be evaluated on a case-by-case basis. New access roads associated with these site developments would provide new access into forested areas that previously had limited or no access to apply forest health management treatments and potentially harvest commercial forest products.

The entire RMPPA would be open to livestock grazing. Livestock management actions would include the implementation of the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which requires meeting standards for vegetation health, wildlife habitat, and riparian habitat.

Livestock grazing would decrease competition from herbaceous plants that compete with tree seedlings for water, sunlight, and nutrition. In open harvest or treatment sites, livestock would also trample the topsoil and spread manure, contributing to the early success and growth of a forest stand in these areas. In areas where livestock concentrate, there would be an increase in the grazing of tree saplings and seedlings in regenerating harvest or treatment sites, thereby causing the trees to grow in a bush-type manner with stunted or stagnant growth, which would potentially lead to the production of an unhealthy forest stand. This also would make the trees weak and susceptible to disease and insect attacks. This has little impact on the growth and production of the overall forest landscape.

Developed recreational sites, such as Prior Flats and Bennett Peak campgrounds, would not be available for commercial forest product harvesting; however, they would be open to forest health management actions to reduce hazardous fire fuels loading in and around the site to help reduce the potential of a catastrophic event such as a wildfire. Recreational pursuits in forested areas are generally compatible with most forest management activities, including forest health objectives and some timber harvesting.

The pursuit of land tenure adjustments within the Shirley Mountain SRMA would create a better opportunity to apply forest health management actions. Ponderosa pine stands in the Pedro Mountains would be managed with a restriction on commercial and noncommercial forest product removal, which would have little to no impact because of the inability to access and harvest forest products in the area.

Actions associated with SD/MA management would have little to no impact on the overall forest health management program. Commercial forest product harvest activities adjacent to the Cave Creek Cave location would be designed in a manner that would not affect water temperature going into the cave.

WSAs (Map 2-6) would be managed according to the Interim Management Policy for Lands Under Wilderness Review, until Congress either designates each WSA as "wilderness" or releases it from consideration and it reverts to multiple-use land. All forest and woodlands within WSAs would be closed to any type of commercial forest product harvesting but would be open to forest health management treatments that do not require the use of mechanical equipment. The use of prescribed natural wildland fire as a forest management tool would reduce hazardous fire fuel loading and promote diversity in stand age class distribution as well as improved forest health. Without periodic disturbance, stands would overstock, stagnate, and develop poor health, thereby creating the potential for insect and disease outbreaks, hazardous fire fuels overloading, and catastrophic wildfire events.

Pursuing access through the transportation and access program to Shirley Mountain, Elk Mountain, Arlington, and Little Medicine through easements (Table 2-8) would increase the ability to apply forest health management actions to BLM-administered forest lands in isolated areas to control insect and disease outbreaks and reduce hazardous fire fuels loading. Individual problem areas would be more likely to be treated in a timely manner, improving the overall health of the forest landscape.

Vegetation management actions would help achieve the objectives of the Healthy Forest Initiative (TITLE I—Hazardous Fuel Reduction on Federal Land, pp. 3–15) (TITLE IV—Insect Infestation and Related Diseases, pp. 22–26) and Healthy Forest Restoration Act of 2003 as well as Wyoming Standards and Guidelines for Healthy Rangelands (Forestland) Management (1997) by promoting good-quality rangeland and aspen stand health. Vegetation treatments would be designed to remove hazardous fire fuel loading, stem conifer encroachment, and remove decadent and diseased clones from aspen stands, thereby allowing young, vigorous, and healthy clones to be released to thrive and grow and potentially increasing the overall health of aspen stands over the long term. Vegetation treatments would be applied to meet management objectives and standards for rangeland health and watershed function. Implementation of vegetation treatments in isolated woodland areas would contribute to the reduction of hazardous fuel loading and promote stand vigor and age class distribution. Priority for control of noxious and invasive species would be to reduce and/or eliminate, where possible, small new infestations and to control large infestations. This would contribute to the control of noxious and invasive weed species, in forest and woodlands, that would compete for food, water, and sunlight with tree seedlings in early stages of germination. Management actions from vegetation management such as mechanical and prescribed fire treatments to aspen stands as well as other riparian and woodland ecosystems to rejuvenate decadent and diseased stands would have a positive impact on the accomplishment of forest health management goals.

VRM classes would be designated as shown in Map 2-51 (Table 2-9 and Appendix 25). Forested public land adjacent to the Medicine Bow National Forest and a portion of Shirley Mountain would fall into VRM Class II. Commercial forest product removals conducted within these areas would be regulated and restricted by rules and guidelines associated with VRM Class II classification. This would influence how large or visible a harvest or treatment unit would be and how large a buffer zone must be between an existing road and/or vehicle route and a treatment or harvest area as well as influence the method of harvest and location and method of construction of access temporary roads.

Surface disturbing activities would be avoided on unstable areas, such as landslides, slopes of greater than 25 percent, slumps, and areas exhibiting soil creep. Surface disturbing activities would avoid identified 100-year floodplains, areas 500 feet from perennial surface water and/ or wetland and riparian areas, and areas 100 feet from ephemeral channels. However, these areas would be open to forest health management actions, such as hazardous fire fuels reduction projects, to improve poor forest health

condition in riparian areas. Leaving buffer zones between harvest sites and riparian and/or drainages would protect those sensitive areas from potentially damaging surface disturbance, such as soil compaction/erosion and significant vegetation and habitat loss, associated with commercial forest product harvests. Forest health management projects and treatments, such as thinning, commercial forest product removal, and hazardous fire fuels management, would be designed to protect sensitive soils from erosion.

Forest health management projects and/or treatments would be regulated by restrictions, such as seasonal closures and timing stipulations, to minimize disturbance and to maintain connectivity across large contiguous blocks of wildlife and raptor habitat, especially identified habitat of T&E species. A 3/4- to 1-mile buffer zone, as well as February 1 to July 31 timing restrictions for nesting raptors, along with big game timing restrictions from November 15 to April 30 for crucial winter range (Maps 2-53, 2-54, and 2-55) and from May 1 to June 30 for big game parturition areas (Maps 2-55 and 2-56) would limit the ability to conduct forest health management actions, such as forest health treatments and commercial harvests. These restrictions would also limit the amount of forest product that would be removed from an area in the event that a raptor is found inhabiting an area or if an area is identified as big game parturition or crucial winter range. These timing restrictions would also limit allowable forest harvest windows. Surface disturbing and disruptive activities would be intensively managed to minimize impacts on identified crucial habitat for sensitive species for the purpose of protecting these species and their associated habitats (Appendices 1 and 15). Sensitive species habitat identified within forested areas would potentially restrict activities associated with forest health management to preserve and protect that habitat. This would potentially reduce the number of harvest/treatment acres as well as contribute to poor forest health and hazardous fire fuel buildup in those identified areas, thereby adding a greater potential for insect, disease, and wildland fire outbreaks.

Summary

There would be little to no impact to forest health management from air quality, minerals, paleontology, SD/MA, transportation and access, OHV, socioeconomics, and wild horse management actions. Forest health management actions would have some potential modifications of projects and treatments from stipulations and restrictions associated with management actions to protect cultural; recreation; VRM; water quality, watershed, and soils; and wildlife resources; however, impacts would be low. Impacts from livestock grazing would be moderate to low. The reintroduction of fire into fire-dependent forest ecosystems as well as the use of fire to reduce fuel loading and promote stand vigor; the acquisition of legal access to Shirley Mountain, Elk Mountain, Arlington, and Little Medicine areas through easements, ROWs, and/or land exchange; and the promotion of good rangeland and aspen stand health through vegetation management actions would all have moderate to low impacts on the overall accomplishment of forest health management goals.

4.5.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from air quality; cultural; livestock grazing; minerals; OHV; paleontology; recreation; socioeconomics; transportation and access; vegetation; water quality, watershed, and soils; and wild horse management would be the same as those in Alternative 1.

With the exception of some SD/MAs (Map 2-1), emphasis would be placed on the suppression of all wildfires, regardless of ignition source. Although these suppression actions would increase the potential for fuel loading, they would also protect timber stands that are of commercial value. There would be an increased need for forest health management actions including but not limited to prescribed burns and commercial harvest to assist in the reduction of hazardous fuels.

Forest management would focus on forest health for timber production, rather than ecological objectives.

The entire RMPPA, with the exception of SD/MA/WSAs, would be open to commercial forest product harvest. The allowable harvest level would be double those identified in Alternative 1. Increases in allowable harvest levels would contribute to the rejuvenation of overmature forest stands by allowing them to be replaced by young and vigorous trees and also to a reduction in the number of stems per acre in overstocked forest stands, thus potentially improving the health and productivity of the overall forest landscape. Stand conversions from even aged stands to uneven aged stands would benefit forest stand health, vigor, age class distribution, and overall productivity as well as improve wildlife habitat by replacing old stagnate stands with young thriving trees and plant life. Larger harvest and/or treatment units would potentially serve as fire breaks between overgrown, mature forest stands, which would potentially lessen the chances of a catastrophic wildfire event occurring. This would also contribute to control of insect and disease spread between unhealthy and healthy forest stands. These actions would have significant impact on forest health management by contributing to the accomplishment of multiple-use management objectives and the development of commercial forest and woodlands to create a spatial mosaic and vertical age class distribution of the forest landscape and promote improved stand vigor as well as reduce hazardous fire fuel and stand overloading while making forest products available to the public.

ROWs to access Shirley Mountain, Elk Mountain, Arlington, and Little Medicine would not be pursued for commercial forest development (Appendix 7). This would decrease the opportunity and ability to pursue commercial forest product harvests as well as implement forest health treatments in these areas. This would also contribute to insect and disease outbreaks, the buildup of hazardous fire fuels, stand overstocking and stagnation, poor forest health conditions, and the potential for a catastrophic wildfire event to occur. Management actions from lands and realty, such as the non-pursuit of land exchanges and easements for the purpose of forest development, would have a moderate to low impact on forest management for maximum commercial forest product harvest yields as well as for forest health in these identified isolated areas because of lack of access.

The Cave Creek Cave area would not be managed as an ACEC, thereby reducing restrictions on ground disturbing activities associated with commercial forest product harvests in that area. However, within 1/4 mile of the Cave Creek Cave area, forest management activities would be intensively managed so as not to disturb or alter the cave's ecosystem and/or water temperature. Commercial forest product harvests in this area would contribute to the accomplishment of maximum harvest levels. Forest product harvest projects in the Cave Creek Cave area would be designed not only to promote and enhance forest health but to improve and protect cultural, wildlife, and ecosystem habitat as well as to meet bat cave management standards and Healthy Forest Initiative objectives. SD/MA management actions would have little to no impacts on forest management actions.

Pursuing access through the transportation and access program through easements (Table 2-8) to access Shirley Mountain, Elk Mountain, Arlington, and Little Medicine would not be pursued for commercial forest development. This would decrease the opportunity and ability to pursue commercial forest product harvests as well as implement forest health treatments in these areas. This would also contribute to insect and disease outbreaks, the buildup of hazardous fire fuels, stand overstocking and stagnation, poor forest health conditions, and the potential for a catastrophic wildfire event to occur. Management actions from lands and realty, such as the non-pursuit of land exchanges and easements for the purpose of forest development, would have a moderate to low impact on forest management for maximum commercial forest product harvest yields as well as for forest health in these identified isolated areas because of lack of access.

Impacts resulting from VRM would be similar to those in Alternative 1, except that Shirley Mountain would be designated as VRM Class III. This change would reduce restrictions on forest management practices, thereby allowing harvesting sites to be more visible from roads and scenic areas and less tailored toward viewshed protection, which would provide more opportunities for commercial forest product removal in areas considered to be of visual value. Fewer restrictions on viewshed protection would contribute to the accomplishment of maximum forest product harvest levels by allowing forested areas considered to be of viewshed value to be harvested without leaving buffer zones or limiting the size, make-up, location, or design of a forest harvest project as long as it does not dominate the view of the landscape.

Impacts to forest health management from wildlife and fisheries management would be similar to those in Alternative 1, except that there would be no timing stipulations and restrictions placed on surface disturbing activities associated with commercial forest product harvests in big game habitat. The removal of timing restrictions and stipulations on big game habitat would allow for earlier start times on forest harvest projects and longer harvest windows. Fewer restrictions in big game habitat, such as parturition and crucial winter ranges, would contribute to increased harvest potential in those identified areas. However, 1/2 mile from the nest buffer zone and increased timing restrictions from April 1 to August 31 for raptors, such as northern goshawks, would potentially reduce the amount of forest product and time of harvesting windows of a potential harvest or treatment site if the area is identified raptor habitat or is known to have a raptor present.

Summary

Impacts from air quality; cultural; livestock grazing; minerals; OHV; paleontology; recreation; socioeconomics; transportation and access; vegetation; water quality, watershed, and soils; and wild horse management would be the same as those in Alternative 1. The suppression of fire would eliminate or highly limit the presence of fire in fire-dependent forest ecosystems and the use of wildland fire as a resource management tool. Such suppressions would contribute to the buildup of hazardous fire fuels as well as stand stagnation and overstocking in woodland areas, but would protect forest areas considered to be of commercial value. Actions from fire and fuels management would have a moderate impact on forest management actions. SD/MA management actions would have little or no impact. VRM would place less restriction on the makeup, design, and placement of commercial forest product harvest and forest health treatment projects as compared with Alternative 1. Implementation of fewer wildlife stipulations and restrictions would allow for more flexibility in implementing forest health actions. The lack of pursuit of access to Shirley Mountain, Elk Mountain, Arlington, and Little Medicine areas through easements, ROWs, and/or land exchanges would have moderate impacts on the overall accomplishment of forest management actions for development under this alternative.

4.5.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from air quality; lands and realty; livestock grazing; paleontology; transportation and access; VRM; socioeconomics; water quality, watershed, and soils; and wild horse management would be the same as those in Alternative 1.

Minerals, OHV, and recreation management actions would have little to no impact on forest health management actions under this alternative.

Surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. Disturbance activities

associated with forest health management, such as hazardous fire fuels reductions, would be restricted in forested areas found to be of cultural value. This would potentially reduce forest health treatment acres as well as contribute to poor forest health conditions and the buildup of hazardous fire fuels in identified cultural avoidance areas. In rare cases, a forest management project or treatment would be precluded if redesign or other mitigation measures were not adequate. Forest health management activities near or adjacent to cultural property areas would be conducted to protect cultural resources and would abide by all cultural laws and/or restrictions that apply.

With the exception of WUIs, some ACECs, and other SD/MAs, the use of wildland fire for resource benefit would be emphasized for all natural ignitions. The use of wildland fire for resource benefit to reduce heavy fuel loading on forest floors, reintroduce fire into stands that are fire-dependent, and create fire breaks between healthy and unhealthy forest stands would over the long term result in improved forest health throughout the overall forest landscape. This would include areas of decadent and/or stagnate forest stands (both conifer and aspen), stands infested with insects or disease, and species like ponderosa pine that have a short fire return interval.

Under Alternative 3, forests and woodlands would be managed with emphasis on protection of resources and natural processes (Appendix 19, Forestry) (Appendix 33, Forestry). Management actions on 28,500 acres of land identified as commercial forests, the majority being in the Shirley Mountain area, would be conducted to enhance forest health through treatments such as stewardship/service and hazardous fire fuels reduction projects as well as to meet public demand for minor wood products (Section 3.5.1 and Map 3-1). Implementing such management actions would potentially reduce forest stand stocking and improve stand spacing, which would open up the forest floor to rain and sunlight, potentially increasing ground vegetation. This would lead to a potential improvement in overall forest stand ecosystem health in these identified commercial forest areas. These actions would have significant impact on forest health management by contributing to the accomplishment of multiple use management objectives and the overall improvement of forest stand health in forests and woodlands to create a spatial mosaic and vertical age class distribution of the forest landscape and promote improved stand vigor as well as reduce hazardous fire fuel and stand overloading while making forest products available to the public.

The Cave Creek Cave area (520 acres) (Map 2-8), would be managed as an ACEC. Forest health management actions would not be allowed within 1/2 mile of the cave complex. This would contribute to a decrease in forest health treatment acres as well as to insect and disease outbreaks, hazardous fire fuels buildup, and increased potential for a wildland fire to spread. As a result of the small acreage within the Cave Creek Cave area and its location, there would be little to no impact to overall forest health management.

Impacts resulting from vegetation management would be similar to those in Alternative 1, except that vegetation treatments would be applied to meet standards for rangeland health and watershed function and to achieve DPC. Habitat for wildlife, habitat for Special Status Species, and priority for control of noxious and invasive species would be managed to attain native, weed-free communities. Implementation of vegetation treatments combined with forest health management actions in isolated woodland areas would contribute to the reduction of hazardous fuel loading and promote stand vigor and age class distribution in those isolated areas. These actions along with the reintroduction of fire as a resource management tool to manage fire-dependent forest and vegetation ecosystems would improve aspen as well as woodland stand and ecosystem health, thus positively affecting the overall accomplishments of forest health management goals.

Impacts resulting from wildlife and fisheries management would be similar to those in Alternative 1, except there would be more protection placed on habitat for raptors, big game, and protected wildlife/fish species in the form of restrictions, timing stipulations, and seasonal closures. Implementation of these

timing restrictions and seasonal closures would highly limit the ability to apply forest health management actions in forested areas identified as critical wildlife habitat. This would potentially contribute to the buildup of hazardous fire fuels, poor forest stand health, and poor wildlife habitat health. Overmature forest stands would out-compete ground vegetation—such as grasses and forbs needed for forage by wildlife—for sunlight and water, thereby causing them to die out.

Summary

Impacts to forest health management actions from air quality, livestock grazing, paleontology, VRM, transportation and access, socioeconomics, and wild horse management would be the same as those in Alternative 1, while lands and realty, minerals, OHV, recreation, and water quality, watershed, and soils management actions would have low impacts. Forest management actions would have stricter guidelines, restrictions, closures, and timing stipulations from cultural and wildlife management actions. There would be some loss of harvestable or treatable acres because of these increased stipulations and/or restrictions. The use of wildland fire for resource benefit to reduce heavy fuel loading on forest floors, reintroduce fire into stands that are fire-dependent, and create fire breaks between healthy and unhealthy forest stands as well as to promote good rangeland and aspen stand health through vegetation management actions would have a positive impact on the overall improvement of forest health and the overall accomplishment of forest health management goals under this alternative.

4.5.5 Impacts Under Alternative 4: Proposed Plan

Impacts to forest health management from management actions associated with air quality, fire and fuels, lands and realty, livestock grazing, OHV, minerals, paleontology, recreation, transportation and access, vegetation, VRM, and wild horse management would be the same as those impacts in Alternative 1.

Wildlife and fish management actions would be similar to those in Alternative 1, except that timing stipulations associated with raptors would be applied to individual nesting species. This would allow for greater flexibility in the application of forest health management actions.

Impacts to forest health management from management actions associated with cultural; water quality, watershed, and soils; and SD/MA management would be the same as those impacts in Alternative 3.

Forest health management actions under this alternative would follow the same procedures and direction as those under Alternative 1, except that there would be 6,700 fewer acres available for commercial forest product removal (Appendix 33, Forestry). Only 21,813 acres identified as commercial forestlands would be available for commercial timber harvest (Section 3.5.1 and Map 3-1). These acres are steep slopes and riparian areas and their associated buffer zones, and they would not be available for commercial timber harvest. However, these areas would be open to forest health management treatments such as hazardous fire fuels reductions or stewardship projects to improve riparian ecosystem health. Implementing such treatments would reduce the potential in those areas for a wildland fire outbreak that would potentially destroy significant habitat. These actions would have a moderate impact on the overall accomplishment of forest health management goals.

Summary

Impacts to forest health management from management actions associated with air quality, fire and fuels, lands and realty, livestock grazing, OHV, minerals, paleontology, recreation, transportation and access, vegetation, VRM, and wild horse management would be the same as those impacts in Alternative 1.

Wildlife and fish management actions would be similar to those in Alternative 1, except that timing stipulations associated with raptors would be applied to individual nesting species. This would allow for greater flexibility in the application of forest health management actions.

Impacts associated with cultural; water quality, watershed, and soils; and SD/MA management would be the same as those impacts in Alternative 3.

4.6 LANDS AND REALTY

This section describes potential impacts on lands and realty management from management actions of other resource programs. Lands and realty management includes land tenure adjustments (sales, exchanges, and acquisitions) and ROWs. Existing conditions concerning lands and realty are described in Section 3.6.

Significance Criteria

Impacts to lands and realty management would be considered significant if either of the following were to occur:

- Substantial reduction in opportunity for ROW authorizations and development activities
- Substantial reduction in the opportunity for land tenure adjustments.

Methods of Analysis

Analysis of the potential impacts on lands and realty management involved close collaboration among BLM resource specialists to compile information based on expertise and knowledge within the RFO. Impact analyses and conclusions are therefore based on the interdisciplinary team knowledge of resources and review of existing literature, as well as information provided by experts in BLM and other agencies. Spatial analysis was conducted using Environmental Systems Research Institute's (ESRI) ArcGIS Desktop 9.1 computer software. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- The lands and realty program is a support program rather than an environmental component. The program responds to requests for authorizations, permits, leases, land tenure adjustments, etc., from other programs or outside entities. The discussion of the effects on the lands and realty program under each alternative will be limited to the influences on community expansion opportunities and ROW authorizations for other permitted activities, that is, whether the effects of other resource actions would potentially influence or modify the location, size, or design of a given proposal or, in some limited cases, preclude a lands and realty action from being approved.

- The demand for disposal of public land would average about 500 acres per year. This acreage includes disposal via direct sale, competitive sale, modified competitive sale, recreation and public purpose (R&PP) lease, desert land entry (DLE) patent, or exchange. Before any disposals, lands would be examined for the presence of high-value resources. Lands containing high surface values would not be disposed of, or the disposal would provide for those values to be preserved. BLM RFO Land Exchange Criteria (Appendix 6) would be used to screen potential land exchanges for possible resource conflicts. Therefore, land disposals would not substantially affect other resource programs. Lands identified for disposal under Sections 203 and 206 of FLPMA and identified as such in this plan are hereby classified for disposal under Section 7 of the Taylor Grazing Act of 1934, as amended (43 U.S.C. 315f) under E.O. 6910, and under 43 CFR 2400.

- Existing withdrawals (with the exception of approximately 3,200 acres of Bureau of Reclamation [BOR] withdrawals) would be retained throughout the life of the plan unless it was determined, through a withdrawal review, that an existing withdrawal(s) would be revoked, or modified.

- The effects of development and designation of transportation and utility ROW corridors would be mitigated on a case-by-case basis. Generally, this would be accomplished by locating future transportation and utility ROWs adjacent to existing facilities (where possible). Designated ROW corridors identified on Map 2-2 shall have a variable width either side of the centerline of the existing facilities (see Lands and Realty section, Chapter 2). The corridors would be designated for (1) aboveground and below-ground power lines, (2) telephone lines, (3) fiber optic lines, (4) pipelines, and (5) other linear-type ROWs. Specific proposals would require site-specific environmental analysis and compliance with established permitting processes. Activities generally excluded from ROW corridors include mineral materials disposals, range and wildlife habitat improvements involving surface disturbance and facility construction, campgrounds and public recreation facilities, and other facilities that would attract public use. ROW facilities would not be placed adjacent to each other if resource conflicts or issues with safety or incompatibility were identified. Criteria for designated ROW corridors are presented in Appendix 34. Designated corridors would vary by total width, number, type, extent, and compatibility of activities. New oil and gas wells would be sited outside these designated ROW corridors. The designated width, allowable uses, and excluded uses would be modified during implementation of the approved RMP.
- Disposal of small, isolated parcels of public land would decrease the cost of public land administration in the RMPPA and enhance efficiency in management of the remaining public lands. In addition, the disposal of these small parcels would decrease conflicts between public land users and private landowners.
- Competitive sales of small, isolated parcels might lead to pricing beyond the capability of the owners of property adjacent to those parcels. If owners of adjacent or surrounding property could not purchase the isolated parcels, land use conflicts might develop.
- RFDs and RFAs can be found in Appendix 33.

4.6.1 Impacts Common to All Alternatives

Air quality, fire and fuels, forest, OHV, recreation, SD/MAs (except those listed below), transportation and access, VRM, and wild horse management would have little or no impact on the lands and realty program.

Management of cultural resources would influence the timing, location, size, and coloration of, but would rarely preclude the development or completion of, lands and realty actions. In most cases, facilities would be relocated to avoid disturbance to intact, buried cultural resources. In areas where the integrity of the setting contributes to NRHP eligibility, proposals resulting in visual elements that diminish the integrity of a property's setting would be redesigned according to applicable requirements (Appendix 5).

Existing withdrawals that close areas to operation of the public land laws would restrict the location or possibly preclude the placement of lands and realty actions. The review of withdrawals would determine whether the withdrawals are serving or are needed for their intended purpose. Withdrawals that are revoked or modified would then open public land to the operations of the public land laws and/or locatable mineral entry, which would open more public land for different types of actions and create more flexibility for placement of projects.

Land acquisitions would mainly be achieved through exchange. This would provide more flexibility and opportunity to site facilities or other lands and realty actions as well as improve the management of the public lands and their resources.

The designation of ROW corridors would consolidate surface disturbance to a specific area and avoid areas with important resource values where possible (Table 2-5). In situations where these areas would not be avoided, additional BMPs would minimize disturbance to these values. In only the rarest of situations would a lands and realty action be precluded.

Coal leasing would entail only reclamation and would have no impact to lands and realty actions.

Lands and realty actions would avoid areas with important paleontological resource values where possible. In situations where these areas would not be avoided, additional BMPs would minimize disturbance to these values, and in only the rarest of situations might a lands and realty action be precluded.

Recreation resources management of developed and undeveloped recreation sites would have a minimal impact on the lands and realty program, due primarily to the small acreage required for recreation sites, which can easily be avoided during placement of ROWs and facilities.

The Shirley Mountain SRMA (24,440 acres), Jelm Mountain SRMA (18,100 acres), and Laramie Plains Lakes SRMA (1,600 acres) would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby improving the manageability of public lands within these areas.

The North Platte River SRMA (5,060 acres) and Continental Divide National Scenic Trail SRMA (600 acres) would restrict oil and gas development within these areas, resulting in less potential for lands and realty actions to occur. Restrictions would potentially include modification of the facilities location, height, and color, and in rare cases would preclude lands and realty actions to protect sensitive values within these SRMAs. Pursuing acquisitions of adjacent private lands would improve the manageability of public lands within these areas.

WSAs (66,120 acres) management under the IMP would preclude facility placement within WSA boundaries. However, this total acreage is spread throughout five WSAs across the entire RMPPA. Therefore, the impacts associated with WSAs on the lands and realty program would be minimal.

Protection measures for Como Bluff ACEC/NNL (1,690 acres) would include restrictions or other mitigation requirements for the protection of paleontological and historical values. These mitigation measures would modify the location, height, and color of lands and realty actions so that historical and paleontological resources are not adversely affected. Because of the relatively small area encompassed by this ACEC, rarely, if ever, would a lands and realty action be prohibited.

The Sand Hills ACEC (7,960 acres), Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres), and High Savery Dam Potential ACEC (530 acres) would preclude surface occupancy. This would require the rerouting of proposed ROWs outside of the SD/MA boundary.

Protection measures for historic trails (66,370 acres) generally include avoidance of the trail or other mitigation measures designed to reduce impacts to historic trail settings. Linear crossings of the trail would occur in previously disturbed areas. These mitigation measures would modify the location, design, height, and color of facilities and, in some cases, would prohibit lands and realty actions that would otherwise adversely affect the trail setting.

The Laramie Plains Lake Area (1,600 acres) would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby improving the manageability of public lands within these areas.

Maintenance of the public land transportation system would provide for public safety and adequate access to public lands. Industry would, in most cases, use existing state, county, or BLM transportation systems for initial access to potential mineral development, wind energy development, communication sites, etc. Once activities are approved by BLM, industry would improve and maintain existing BLM roads or develop new roads and routes to meet development and operational needs.

Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas to preexisting native plant species and eliminate weeds (Appendix 36). Habitat containing threatened, endangered, proposed, and candidate plant species (Appendix 10) would potentially limit the location of utility/transportation facilities, wind energy, and/or communication sites.

Water quality, watershed, and soils management actions would include the avoidance of areas with water resources, unstable soils, and steep slopes. These management actions would likely change the location or design of some projects but are unlikely to preclude issuing ROWs and permits for projects. Intensive management of projects within contributing areas of waterbodies listed as threatened or impaired on the 303d list would be required, which would likely include mitigation or BMPs but would likely not preclude projects (Appendix 13).

Management of wildlife resources would restrict the location, height, and color of facilities; restrict construction and/or maintenance schedules; and, in some cases, would prohibit lands and realty actions that would otherwise adversely affect the wildlife resources and/or their habitat.

4.6.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, fire and fuels, forest, OHV, SD/MAs (except those listed below), transportation and access, and wild horse management would have little or no impact on the lands and realty program.

The protection of the setting of cultural properties (where the setting contributes to NRHP eligibility) would be achieved through avoidance within 1/4 mile of the cultural property or other mitigation measures (Appendix 5). In rare cases, lands and realty actions would be precluded, especially those involving higher-profile structures such as power lines, communication sites, and wind energy developments. ROWs and facilities would be hidden, screened, or redesigned to minimize impacts to the contributing setting.

The protection of sensitive areas (e.g., Chain Lakes, dunal areas) would be achieved through cultural monitoring on a case-by-case basis and would have little or no impact on the lands and realty program.

Closure of approximately 63,670 acres to the operation of the public land laws to maintain resource values would potentially restrict the location of ROWs or prohibit lands and realty actions.

Land tenure adjustments would benefit the overall management of the public land through consolidation or disposal of isolated parcels. Identified land tenure adjustments, approximately 61,010 acres, would be pursued as appropriate. Acquiring state in-holdings in wild horse herd management areas (HMA), WSAs, etc., would consolidate management and reduce fragmented surface ownership within these areas. The ability to sell or exchange land and to issue R&PP leases would benefit both communities and industry by allowing for needed community and economic expansion. The disposal of isolated tracts, preferably through exchange, would result in the disposal of lands that are difficult to manage, thereby improving the overall manageability of public lands within the RMPPA.

Intensive surface management of energy development and exploration within 1/4 mile of the incorporated boundaries of all cities (1,500 total acres) would in rare cases limit ROW actions in these areas. However, this limitation would maintain the availability of unencumbered public land for potential community expansion.

Precluding development of alternative energy systems on approximately 111,770 acres would limit the placement of these facilities. However, the majority of these exclusions are located in poor to moderate wind energy potential areas. Therefore, the restrictions associated with this action would not significantly affect the ability to develop alternative energy systems within the RMPPA.

Avoidance of sensitive areas or SD/MAs would restrict the location of or in some cases preclude the development of utility and transportation systems and communication sites (Table 2-5; 518,300 acres). In situations where these areas would not be avoided, applicable BMPs or mitigation measures would be required so as to ensure that important resources are not adversely affected. The application of BMPs would potentially result in project redesign, relocation, or restriction of construction and/or maintenance schedules.

Livestock grazing mitigation measures applied to lands and realty actions associated with oil and gas development would alter the location or design of these actions.

Existing and future mineral leasing, exploration, and development would preclude the ability to sell or exchange subsurface public land parcels. The duration of the impact would be directly related to whether the federal leases are held by mineral production and for how long the production continues. The number of ROWs associated with oil and gas development activities is directly related to the oil and gas potential of an area. In areas with high oil and gas potential, there would be a greater number of ROWs because more production facilities would be required to extract the resource.

Paleontological resources would potentially restrict the location of lands and realty actions that would otherwise adversely affect paleontological values. As previously stated, the majority of lands and realty actions processed within the RMPPA would be within the oil and gas high and moderate potential areas. As approximately 25 percent of the Class 5 fossil yield formations lie within areas with high and moderate oil and gas potential, it is likely that lands and realty actions would have a moderate potential to affect paleontological resources. Application of BMPs and mitigation measures would potentially result in project redesign or relocation to avoid paleontological resources. Because of the relatively small area encompassed by individual paleontological resources, rarely, if ever, would a lands and realty action be prohibited.

Recreation sites would preclude operation of the public land laws, including sale. There would be minimal impacts on the lands and realty program from recreation management primarily because of the small acreage required for recreation sites, which can easily be avoided during placement of ROWs and facilities. Therefore, recreation management would have little or no impact on lands and realty.

WSA (66,120 acres) management under the IMP would preclude facility placement within WSA boundaries to maintain the wilderness characteristics.

Protection measures for Como Bluff ACEC/NNL (1,690 acres) would include restrictions or other mitigation requirements for the protection of paleontological and historical values. Intensive management of surface disturbing and disruptive activities within 1/4 mile of exposures of the Morrison Formation would potentially result in additional BMPs or mitigation measures. These mitigation measures would modify the location, height, and color of lands and realty actions so that historical and paleontological resources are not adversely affected. Because of the relatively small area encompassed by this

management area and the limited public land within this management area, rarely, if ever, would a lands and realty action be prohibited.

Management actions for the Sand Hills ACEC (7,960 acres) would modify or restrict the placement of lands and realty projects, such as utility/transportation systems and communication sites. The ACEC would be an avoidance area to protect the relevant and important values. Should situations arise where the ACEC would not be avoided, additional BMPs would be applied to minimize disturbance. Wind energy projects would be excluded from within the boundaries of the ACEC, which would limit the placement of these facilities within fair to good potential areas.

Management actions for the Jep Canyon ACEC (13,810 acres) would modify or restrict the placement of facilities in this area.

Laramie Peak WHMA would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby expanding habitat to meet the objectives of the management area. However, the nature of the terrain would preclude placement of major linear transportation facilities.

Protection measures for historic trails (66,370 acres) generally include avoidance of the trail or other mitigation measures designed to reduce impacts to historic trail settings. These mitigation measures would modify the location, height, and color of facilities and, in some cases, would prohibit lands and realty actions that would otherwise adversely affect the trail setting.

Protection measures for T&E and Special Status Species habitat for the Laramie Plains Lakes Potential ACEC (1,600 acres) and the Blowout Penstemon Potential ACEC (17,050 acres) would include modification for the location of lands and realty actions or, in rare cases, would prohibit lands and realty actions that would otherwise adversely affect the potential habitat. Increased potential habitat in public ownership would increase opportunity to route or site lands actions where minimum disturbance would occur.

The Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres) and High Savery Dam Potential ACEC (530 acres) would preclude surface occupancy. This would require the reroute of proposed lands and realty actions.

Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas to preexisting native plant species and eliminate weeds (Appendix 36, Reclamation). Habitat containing threatened, endangered, proposed, and candidate plant species, as well as those plants listed on the Wyoming BLM sensitive list (Appendix 10), would potentially limit the location of utility/transportation facilities, wind energy, and/or communication sites. The sensitive species habitat would be avoided where possible, and, in situations where these areas would not be avoided, additional BMPs would minimize disturbance to the habitat.

VRM classes would potentially restrict projects within VRM Class II areas of approximately 359,610 acres. To maintain the visual settings, ROWs and associated facilities would require mitigation measures, including reducing the height of structures, painting structures to match the existing environment, and/or redesigning or relocating facilities that would allow ROWs and facilities to blend better into the surrounding landscape, and, in rare cases, would prohibit lands and realty actions.

Water quality, watershed, and soils management actions include the avoidance of areas with water resources, unstable soils, and steep slopes. These management actions would likely change the location or design of some projects but are unlikely to preclude issuance of ROWs and permits for projects. Intensive management of projects within contributing areas of waterbodies listed as threatened or impaired on the

303d list would be required, which would likely include mitigation or BMPs but would likely not preclude projects (Appendix 13).

Mitigation measures (e.g., seasonal restrictions) to protect wildlife resources and T&E species and Critical habitats would restrict the timing of surface disturbing and other disruptive activities, and would restrict the location of facilities to avoid sensitive habitats.

Summary

Under Alternative 1, it is anticipated that there would be no reduction in ROW authorizations and development activities, although there would be the need to protect other sensitive resources and habitats, which would influence the location, opportunity, and timing of ROWs and other land and realty authorized facilities. Protection of sensitive resources would have minimal influence on the ability to sell or exchange public lands to meet community expansion needs. Therefore, no significant impacts would occur to the lands and realty program under this alternative.

4.6.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from air quality, cultural resources; fire and fuels; forest; livestock grazing; OHV; paleontological; recreation; SD/MAs (except those listed below); transportation and access; water quality, watershed, and soils; and wild horse management would be the same as those under Alternative 1.

Closure of approximately 6,400 acres to the operation of the public land laws to maintain resource values would restrict the location of ROWs or prohibit lands and realty actions.

Land tenure adjustments would benefit the overall management of the public land through consolidation or disposal of isolated parcels. Land tenure adjustments identified, of approximately 46,230 acres, would be pursued as appropriate. Acquiring state in-holdings in wild horse HMAs, WSAs, etc., would consolidate management and reduce fragmented surface ownership within these areas. The ability to sell or exchange land and to issue R&PP leases would benefit both communities and industry by allowing for needed community and economic expansion. The disposal of isolated tracts would result in the disposal of lands that are difficult to manage, thereby improving the management of public lands within the RMPPA.

Intensive surface management of energy development and exploration within 1/4 mile of the incorporated boundaries of all cities (1,500 total acres) would be the same as in Alternative 1.

A reduction in the acres of avoidance for utility and transportation systems management, alternative energy development, and communication sites would provide increased opportunity for ROWs and facility placement.

Impacts resulting from minerals management would include increased opportunities and the flexibility for the siting of proposed actions.

Management actions for the Sand Hills WHMA (7,960 acres), Como Bluff NNL (1,690 acres), Jep Canyon WHMA (13,810), Shamrock Hills WHMA (18,400 acres), and WSRs would be same as those under Alternative 1, except that wind energy projects would be allowed to occur. However, the resource values of the areas would be protected through BMPs and mitigation, potentially resulting in modification or alteration to the proposed action.

Protection measures for habitat for the endangered Wyoming toad within the Laramie Plains Lakes Potential ACEC would include modification for the location of lands and realty actions or, in rare cases, would prohibit lands and realty actions that would otherwise adversely affect the potential habitat.

The Blowout Penstemon Potential ACEC area (130 acres) would be an avoidance area and would restrict the location of ROWs and facilities. Should situations arise where the Potential ACEC would not be avoided, additional BMPs would be applied to minimize disturbance to the habitat.

Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas to preexisting native plant species and eliminate weeds (Appendix 36). Habitat containing threatened, endangered, proposed, and candidate plant species (Appendix 10) would potentially limit the location of utility/transportation facilities, wind energy, and/or communication sites. BLM state sensitive species would not be afforded any protection; therefore, the potential for reduction in species would occur.

Impacts resulting from the reduction in VRM Class II acreage would result in fewer restrictions and would increase opportunities to route or site lands actions.

Wildlife and fisheries actions would result in fewer timing and distance restrictions, which would allow for construction of lands and realty actions for longer periods throughout the year.

Summary

Under Alternative 2, it is anticipated that there would be no reduction in ROW authorizations and development activities. The potential exists that there would be an increase in ROW authorizations and development activities because of fewer restrictions. Protection of sensitive resources would have minimal influence on the ability to sell or exchange public lands to meet community expansion needs. No significant impacts would occur to lands and realty management activities under this alternative.

4.6.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from air quality, fire and fuels, forest, livestock grazing, OHV, paleontological, SD/MAs (except those listed below), transportation and access, WSAs, and wild horse management would be the same as those under Alternative 1.

The protection of the setting of cultural properties (where the setting contributes to NRHP eligibility) would be achieved through exclusion within 1/4 mile of the cultural property. This would influence the location of lands and realty actions allowed to occur within the RMPPA.

The protection of sensitive areas (e.g. Chain Lakes dunal areas) would be achieved through cultural monitoring. The monitoring would ensure that cultural properties not visible on the surface are protected but would have little impact on lands and realty.

Closure of approximately 270,610 acres to the operation of the public land laws to maintain resource values would restrict the location of ROWs or prohibit lands and realty actions.

Intensive surface management of energy development and exploration within 1/2 mile of the incorporated boundaries of all cities (4,500 total acres) would limit the ROW actions in these areas. However, the limitation would maintain the availability of unencumbered public land for potential community expansion.

The increase in acreage of avoidance areas would result in fewer opportunities for the placement of facilities for utility and transportation systems, alternative energy development, and communication sites.

Impacts resulting from minerals management would be the same as those of Alternative 1, except that there would be less mineral development, resulting in fewer ROW actions.

Developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/2-mile area (an additional 12,750 acres) would be open to oil and gas leasing with an NSO stipulation, and closed to the operation of the public land laws, which would preclude the placement of ROWs and easements; however, because these sites are relatively small, there would be sufficient opportunity outside of these areas for placement of ROWs and easements.

The North Platte River SRMA (12,740 acres) would be closed to the operations of the public land laws, which would result in fewer opportunities for the placement of facilities.

The Continental Divide National Scenic Trail SRMA (600 acres), Jelm Mountain SRMA (18,100 acres), Pedro Mountains SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be closed to land tenure adjustments, which would retain the opportunity to site facilities; however, the goals for the SRMAs would likely preclude placement of facilities within the SRMAs.

The North Platte River SRMA (12,740 acres), Jelm Mountain SRMA (18,100 acres), and Laramie Plains Lakes SRMA (1,600 acres) would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby expanding the acres of contiguous public land, which would influence or reduce conflicts with siting of facilities or ROWs.

Closure of the North Platte River SRMA (12,740 acres) to new oil and gas leases would restrict and/or require additional mitigation on existing oil and gas leases. These mitigation measures would modify the location of lands and realty actions.

The Shirley Mountain SRMA (37,820 acres), Jelm Mountain SRMA (18,100 acres), Pedro Mountains SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be open to oil and gas leasing with an NSO stipulation, which would preclude the placement of ROWs and facilities; however, because these areas are relatively small, there would be sufficient opportunity outside of these areas for placement of ROWs and facilities.

Impacts resulting from the Continental Divide National Scenic Trail SRMA would be the same as in Alternative 1, except that it would preclude any land tenure adjustments. It would possibly increase lands and realty actions by initiating withdrawals for the management areas.

Como Bluff NNL/ACEC (1,690 acres), Sand Hills ACEC and JO Ranch Expansion (12,680 acres), Jep Canyon WHMA (13,810 acres), Shamrock RCA (18,400 acres), Chain Lakes ACEC (30,560 acres), Cave Creek Cave ACEC (520 acres), Laramie Plains Lakes ACEC (1,600 acres), Historic Trails ACEC (66,370 acres), and WSR SD/MA (23,770 acres) would be closed to the operations of the public land laws, which would result in fewer opportunities for the placement of facilities.

Stratton Sagebrush Steppe ACEC (5,530 acres), Red Rim-Daley ACEC (11,100 acres), Upper Muddy Creek Watershed/Grizzly ACEC (59,720 acres), Cow Butte/Wild Cow WHMA (49,570 acres), and High Savery Dam ACEC (530 acres) would be closed to land tenure adjustments, including sale, which would retain the opportunity to site facilities; however, the goals for the SRMAs would likely preclude placement of facilities within the SRMAs.

Como Bluff NNL (1,690 acres), Jep Canyon ACEC (13,810 acres), Red Rim-Daley ACEC (11,100 acres), Pennock Mountains ACEC (7,770 acres), Laramie Plains Lakes ACEC (1,600 acres), Historic Trails ACEC (66,370 acres), Blowout Penstemon ACEC (17,050 acres), and White-Tailed Prairie Dog ACEC (109,650 acres) would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby expanding the acres of contiguous public land, which would influence or reduce conflicts with siting of facilities or ROWs.

Closure of the Sand Hills and JO Ranch Expansion ACEC (12,680 acres), Jep Canyon WHMA (13,810 acres), Wick-Beumee WHMA (280 acres), Laramie Plains Lakes ACEC (1,600 acres) Stratton Sagebrush Steppe Research Area ACEC (5,530 acres), Cave Creek Cave ACEC (520 acres), Cow Butte/Wild Cow WHMA (49,570 acres), and Upper Muddy Creek Watershed/Grizzly ACEC (59,720 acres) to new oil and gas leases would restrict and/or require additional mitigation on existing oil and gas leases. These mitigation measures would modify the location of lands and realty actions.

Como Bluff ACEC/NNL (1,690 acres), Historic Trails ACEC (66,370 acres), and Continental Divide National Scenic Trail SRMA (600 acres) would be open to oil and gas leasing with an NSO stipulation, which would preclude the placement of ROWs and facilities; however, because these areas are relatively isolated, there would be sufficient opportunity outside of these areas for placement of ROWs and facilities.

The Blowout Penstemon ACEC (17,050 acres) would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby expanding habitat to meet the objectives of the management area. However, this area is an exclusion area for utility/transportation systems and wind energy projects, which would limit the placement of these facilities within fair to outstanding potential areas.

Protection measures for historic trails would preclude lands and realty actions within 1/4 mile from the Overland Trail, Cherokee Trail, Rawlins-to-Baggs Wagon Road, and Rawlins-to-Fort Washakie Road on new oil and gas leases and would include restrictions or other mitigation requirements for the protection of cultural values on existing oil and gas leases. These mitigation measures would modify the location of lands and realty actions that would otherwise adversely affect these values.

The White-Tailed Prairie Dog Potential ACEC would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby expanding habitat to meet the objectives of the management area. Protection measures would preclude lands and realty actions within 164 feet of prairie dog towns within the management area. It would also modify above-ground facilities to be equipped with anti-perching devices within 1/4 mile of prairie dog towns.

Impacts resulting from the High Savery Dam Potential ACEC would be the same as in Alternative 1, except that it would preclude any land tenure adjustments. It would possibly increase lands and realty actions by initiating withdrawals for the management areas.

WSRs would be closed to oil and gas leasing, which would reduce the number of ROW actions. Surface disturbing activities would be prohibited within 1/4 mile on either side of the Encampment River, which would modify the location of lands and realty actions that would otherwise adversely affect these values.

Vegetation management actions would be similar to those described in Alternative 1 with the addition of management actions to meet DPC objectives for reclamation in rangelands. These objectives would require changes in seed mixtures and/or planting methods to promote desired plant species (Appendix 36).

Management of VRM Class II areas would potentially restrict projects within approximately 351,050 acres. To maintain the visual settings, ROWs and associated facilities would require mitigation measures, including reducing the height of structures, painting structures to match the existing environment, and/or redesigning or relocating facilities that would allow ROWs and facilities to blend better into the surrounding landscape and, in rare cases, would prohibit lands and realty actions.

Impacts resulting from water quality, watershed, and soils management would be the same as those described in Alternative 1, except that management of the Encampment River watershed would preclude new permanent roads or structures in this area.

Impacts to lands and realty actions from wildlife and fisheries would preclude construction during a greater part of the year because of increased timing restrictions and greater avoidance distances. In addition, surface disturbing and disruptive activities would be prohibited within big game parturition areas. Land disposals would also be precluded in areas where Special Status and sensitive wildlife species and habitats are found.

Summary

A slight reduction in ROW authorizations and development activities would occur under this alternative. The presence of various Special Status and sensitive wildlife species and habitats would preclude land disposal. Also, the additional VRM Class II areas would restrict or, in some cases, preclude lands and realty actions such as higher-profile structures (e.g., power lines, communication sites, and wind energy development).

4.6.5 Impacts Under Alternative 4: Proposed Plan

Impacts from air quality, cultural, fire and fuels, forest, livestock grazing, minerals, OHV, paleontological, recreation, SD/MAs (except those listed below), and wild horse management would be the same as those described in Alternative 1.

Impacts resulting from cultural resources for setting and vegetation, except for Blowout Penstemon (see separate SD/MA analysis) would be the same as those as described in Alternative 3.

Impacts resulting from land tenure adjustments identified as suitable for disposal would be the same as described in Alternative 2.

Closure of approximately 14,950 acres to the operation of the public land laws to maintain the resource values would restrict the location of ROWs or prohibit any lands and realty actions.

Intensive surface management of energy development and exploration within 1/4 mile of the incorporated boundaries would be the same as described in Alternative 1, except that new oil and gas leases would be encumbered with an NSO stipulation, which would preclude the placement of ROWs.

Impacts as a result of utility and transportation systems management, alternative energy development, and communication sites would be the same as described in Alternative 1.

Impacts resulting from the management of the Shirley Mountain SRMA and Rawlins Fishing SRMA would be the same as in Alternative 3.

The Continental Divide National Scenic Trail SRMA, Jelm Mountain SRMA, and Pedro Mountains SRMA would not be closed to land tenure adjustments, which would retain the opportunity to site

facilities; however, the goals for the SRMAs would likely preclude placement of facilities within the SRMAs.

Impacts from the North Platte River SRMA would be the same as in Alternative 3 for surface disturbance on existing oil and gas leases and as in Alternative 1 for surface disturbance activities within 1/4 mile on either side of the river.

Impacts from the Laramie Plains Lakes SRMA would be the same as in Alternative 3, and would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands to meet the objectives of the management area.

Impacts resulting from the management of the Historic Trails area; Blowout Penstemon ACEC (17,050 acres); Stratton Sagebrush Steppe Research Area (5,530 acres); and water quality, watershed, and soils management would be the same as in Alternative 3, except the Historic Trails area would not be closed to the operation of the public land laws, which would increase the opportunity for the placement of facilities in this area.

Protection measures for Como Bluff NNL would be the same as those described in Alternative 1, except that impacts would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby protecting the resource values.

Impacts resulting from management of the Sand Hills ACEC would be the same as those described in Alternative 1, except that it would preclude placement of ROWs within the JO Ranch (18 acres).

Impacts resulting from management of the Jep Canyon WHMA would be the same as those described in Alternative 1, except for the possible increase in lands and realty actions by initiating the acquisition of adjacent private lands.

Impacts from the Chain Lakes WHMA would result in restrictions on lands and realty actions within the unique alkaline desert wetland communities. Should situations arise where the WHMA would not be avoided, additional BMPs would be applied to minimize disturbance and, in some cases, would prohibit lands and realty actions that would otherwise adversely affect the habitat in the management area.

Impacts from management of the Cave Creek Cave Potential ACEC would preclude disposal of public land within the management areas.

Impacts from management of the Upper Muddy Creek Watershed/Grizzly Potential ACEC would be the same as in Alternative 3 for surface disturbance on existing oil and gas leases and as in Alternative 1 for surface disturbance around perennial surface water and/or wetland and riparian areas.

Cow Butte/Wild Cow Potential WHMA would preclude surface disturbing activities in aspen and mountain shrub communities to improve seral structure, thereby reducing the number of ROW actions in the management area. Impacts would be the same as in Alternative 3 for surface disturbing activities on oil and gas leases and as in Alternative 1 for the operation of the public land laws.

WSRs would be the same as in Alternative 1, except that the Encampment River Canyon WSA would preclude surface disturbing activities, which would reduce the number of ROW actions.

Laramie Plains Lakes WHMA would possibly increase lands and realty actions by initiating the acquisition of adjacent private lands, thereby expanding habitat to meet the objectives of the management area. The management area would preclude surface occupancy for new oil and gas leases, and increase

mitigation measures such as modification of the location of lands and realty actions or, in rare cases, would prohibit lands and realty actions that would otherwise adversely affect the potential habitat.

Impacts resulting from transportation and access would be the same as in Alternative 2.

Protection measures for vegetation communities would be the same as in Alternative 1, except that no surface occupancy would be allowed within occupied habitat for threatened, endangered, proposed, and candidate species. The presence of blowout penstemon habitat would preclude land disposal.

VRM management classes would potentially restrict projects within VRM Class II areas of approximately 346,670 acres. To maintain the visual settings, ROWs and associated facilities would require mitigation measures, including reducing the height of structures, painting structures to match the existing environment, and/or redesigning or relocating facilities that would allow ROWs and facilities to blend better into the surrounding landscape, and, in rare cases, would prohibit lands and realty actions.

Water quality, watershed, and soils management actions would have the same impacts as those described in Alternative 1, except that ROWs within the Encampment River watershed (Map 2-20) would require proposed actions to consider access to private property and community expansion. This would restrict the location or limit some surface ROWs in this watershed.

Mitigation measures (e.g., seasonal restrictions) to protect wildlife resources and T&E species and Critical habitats would restrict the timing of surface disturbing and other disruptive activities, and would restrict the location of facilities to avoid sensitive habitats. Land disposals would also be precluded in areas where Special Status and sensitive wildlife species and habitats are found.

Summary

It is anticipated that there would be little reduction in capability to site ROWs and facilities, except that the type, location, route, height, and color of ROWs and facilities in more areas would be influenced by BMPs, mitigation measures, etc., to protect various sensitive resources and special areas.

4.7 LIVESTOCK GRAZING

This section describes potential impacts on livestock grazing from management actions for other resource programs. Existing conditions concerning livestock grazing management are described in Section 3.7.

Significance Criteria

Impacts on livestock grazing activities would be considered potentially significant if the following were to occur:

- Resource management actions cause a reduction in forage that results in a greater than 10-percent permanent reduction in animal unit months (AUM) available for livestock grazing within the RMPPA or a given allotment.
- Resource management actions reduce or eliminate the opportunity to run the livestock of choice.

Methods of Analysis

Environmental impacts associated with the management alternatives are caused by land use activities within the RMPPA. Impacts on livestock grazing activities are generally the result of activities that affect management of forage levels for individual grazing allotments. Impact analyses and conclusions are based on interdisciplinary team knowledge of resources and the project area, review of existing literature, and information provided by specialists within BLM or other agencies. Effects are quantified where possible. In the absence of quantifiable data, best professional judgment was used. Certain assumptions are made concerning the level of land use activity, resource condition, and resource response on which to determine potential impacts.

The analysis is based on the following assumptions:

- Livestock grazing would occur throughout the entire RMPPA.
- Anticipated grazing use would be similar to the recent 10-year average (1991–2000) of 273,938 AUMs (allowing for year-to-year fluctuations).
- The type of grazing use would be expected to remain about the same: cattle would use 246,540 AUMs (90 percent of the total), sheep would use 24,650 AUMs (9 percent of the total), and other types of livestock would collectively use 2,740 AUMs (1 percent of the total).
- RFDs and RFAs can be found in Appendix 33.

4.7.1 Impacts Common to All Alternatives

Air quality management would have little or no impact to livestock grazing.

In general, management actions associated with cultural resources affect relatively small localized areas and would not have measurable effects on livestock forage. Even under the most intense management (i.e., excavation), the amount of acreage disturbed would be small. Cultural sites that are fenced would exclude grazing, causing a small loss of available forage; however, this would occur on few sites. Restrictions on surface disturbing activities near cultural sites would potentially result in modifications or relocation of range improvements, but not preclude them except in rare cases.

Deferment of livestock use after a wildland fire allows the establishment of new vegetation and would have a short-term effect on livestock operators through the reduction in available AUMs and modification of grazing systems. Although these impacts are short-term, they can result in serious impacts to the affected grazing permittees, such as additional expenses and/or lost revenues. The severity of these impacts will vary from one situation to another depending upon the size of the burned area and alternative forage sources available in the local area. Temporary fences that are constructed would potentially require maintenance by the livestock operator. Wildland fires result in additional maintenance or reconstruction of range improvements such as fences and corrals that are damaged during the fire or suppression activities. This would potentially result in herding of livestock and a reduction in pastures available for use.

Forestlands would be managed to sustain forest health objectives for the benefit of other resource values, such as wildlife, watershed, fisheries, and healthy plant communities. Management practices would include removal of conifers that have encroached into shrub and aspen stands, thinning of diseased and insect-infested trees, and reducing fuel loads. These practices would result in increased understory vegetation, which would increase forage and potentially increase water for livestock.

Short-term impacts from lands and realty management actions, such as the construction of power lines and pipelines, and other construction activities would temporarily reduce forage and displace livestock. Long-term impacts would affect approximately 5,794 acres, which would result in the loss of forage where roads and facilities are constructed. In areas adjacent to roads and facilities, increased dust on vegetation would reduce forage palatability. The continued expansion of weeds would impact livestock through reduced forage and increased livestock death loss from poisonous plants. Long-term loss of forage would occur as a result of road construction, land disposals and exchanges, and development of wind farms and other facilities. Reclamation of disturbed areas would replace the forage lost, primarily with grasses in the short term, which would benefit cattle more than sheep.

Increased human activity associated with lands and realty management actions would lead to disturbance to livestock; in addition, damage to fences, and gates left open would allow livestock to escape. This would result in increased efforts to locate, gather, and transport livestock. Animals that mix with other herds would have an increased potential to be exposed to diseases and to breed at the wrong time or with the wrong individuals. This would potentially change the time at which cows calve, birth weights, and mortality rates of cow and calves.

The effects of livestock grazing management on livestock grazing management are principally the effects of forage removal by the grazing animals, which would potentially alter the amount, condition, and vigor of the plants being grazed. Adjustments in grazing operations to comply with the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would affect livestock operators. These adjustments would include changes in season or duration of use, development of riparian pastures and exclosures, modification of forage utilization levels, and type of livestock grazed. Rotational grazing, range improvement projects, and other BMPs are intended to increase livestock dispersal in pastures and reduce the effects that livestock have upon the forage being grazed. These practices often improve the condition and production of the forage, which would further increase flexibility for the grazing management program. The use of smaller pastures would also result in increased conception rates, higher weaning weights, and fewer bulls needed for breeding. Animals within smaller pastures would be monitored more efficiently, which would result in improved care of sick animals, reduced animal mortality, and increased overall production. Higher-intensity, short-duration grazing management programs would increase the amount of herding and range improvement maintenance required by the livestock operator. In areas supporting wild sheep, domestic sheep and goat grazing would be avoided, which would reduce livestock management flexibility. In addition to grazing management, control of grazing animals is an important factor, particularly as it relates to fence conversions where creating more “wildlife-friendly” fences must

be balanced with adequate control of livestock. When cattle leave their permitted grazing area, the legal components of trespass and enforcement issues and disputes between neighbors are most apparent. However, there are also costs to the operation from retrieval of stray livestock, livestock that are missing at shipping dates, increased risk of disease transmission, unintended breeding and changes in herd genetics, breeding of first-calf heifers by large birthweight bulls resulting in increased death loss of both calves and heifers, and calves being born outside the planned calving period, which expands into lowered conception rates, weaning weights, and selling prices because of lack of uniformity.

Minerals management activities in areas with high or moderate oil and gas potential would affect 107 allotments that contain approximately 222,000 AUMs (47 percent of the public AUMs within the RMPPA) used by 28 livestock operations. Surface disturbance from the construction of pipelines and well sites would result in short-term removal of forage and displacement of livestock. In the long term, there would be a reduction of forage availability where roads and facilities are constructed, decreased productive life of mother cows from tooth wear and increased cow replacement, and increased disturbance or mortality to livestock caused by increased levels of vehicle activity. The continued expansion of weeds would reduce forage availability and increase livestock death loss from poisonous plants. Reclamation of disturbed areas would replace the forage lost, primarily with grasses in the short term, which would benefit cattle more than sheep. Increased human activity would lead to disturbance to livestock; in addition, damage to fences and gates left open would allow livestock to escape. Animals that mix with other herds would have an increased potential to be exposed to diseases and to breed at the wrong time or with the wrong individuals. This would potentially change the time at which cows calve, birth weights, and mortality rates of cow and calves. Increased road networks would allow for improved access to check, move, or provide supplements to livestock. However, vehicle traffic on roads also creates dust, which settles on vegetation, reducing plant growth and palatability and changing livestock distribution of grazing use. Although loss of forage available for livestock grazing is the most apparent affect from surface disturbing activities, the sum of the impacts described, which reduce flexibility and increase complexity of management, has the greatest effect upon livestock operations.

The only remaining coal mine in the area is closing and is being reclaimed. The lands would be available for livestock grazing after reclamation has occurred, which would restore AUMs available for livestock use. These reclaimed lands often support higher quality and quantity of forage than existed before the mine.

Oil and gas exploration and development on BLM-administered lands creates a network of access roads, pipelines, wells, and other facilities. Pipeline construction would potentially result in instances of livestock falling into construction trenches, causing injury and/or death. Produced water from oil and gas activities would be made available for livestock use if water quality met state standards for such use. This additional water would improve distribution of livestock use and flexibility in the season of use, as well as increase the forage available for livestock.

OHV use would cause animal displacement, increased dust on forage that reduces palatability, and injury or death to animals as a result of vehicle-animal collisions. Designated OHV areas that are closed to livestock grazing would result in a small loss of forage. OHV use that results in gates left open or cut fences would increase required fence maintenance and the resources needed to locate and return livestock to their appropriate grazing areas. These impacts on livestock operations would likely increase over the life of the plan, because the popularity of outdoor recreational activities is increasing.

In general, management actions associated with paleontological resources affect relatively small localized areas and would not have measurable effects on livestock management or forage availability. Even under the most intense management (i.e., excavation), the amount of acreage disturbed would be small. Paleontological sites that were fenced would exclude grazing, causing a small loss of available forage.

Restrictions on surface disturbing activities near paleontological sites would potentially result in modifications or relocation of range improvements but not preclude them, except in rare cases.

Recreational activities would cause animal displacement, increased dust on forage that reduces palatability, and injury or death to animals as a result of vehicle-animal collisions. Grazing closures in recreational areas would result in a small loss of forage. Minor impacts to livestock grazing would result from the temporary removal of vegetation by campers in concentrated areas. Recreational activities that result in gates left open or fences cut would increase required fence maintenance and the resources needed to locate and return livestock to their appropriate grazing areas. These impacts on livestock operations would likely increase over the life of the plan, because the popularity of outdoor recreational activities is increasing.

Minimal effects on livestock grazing activities would be anticipated as a result of management actions associated with SD/MAs. In general, the protections afforded to these areas (i.e., restrictions on surface disturbing activities) would help to maintain and improve vegetation conditions, thereby maintaining or improving forage for livestock. WSAs would be managed according to the Interim Management Policy for Lands under Wilderness Review. Within WSAs, the use of mechanical equipment is limited and the integrity of the wilderness setting must be maintained, which would increase the complexity of construction techniques for range improvements and limit the types of improvements that are feasible. WHMAs would be managed with an emphasis on wildlife habitat and range improvements would be evaluated on a case-by-case basis, which would potentially increase the complexity of construction of rangeland improvement projects. Within 1 mile of blowout penstemon occupied habitat (9,542 acres), new water developments would be prohibited, which would restrict flexibility in livestock management and reduce opportunities to use water to improve the distribution of livestock use.

Transportation and access management actions would serve to improve the transportation network, which would increase the distribution of people within the RMPPA. This would in turn increase the potential for incidental damage to range improvements and general disturbance of livestock. Increased road networks would allow for improved access to check, move, or provide supplements to livestock. Increased traffic on highways makes livestock trailing and crossing more difficult and raises the threat to public health and human safety for both travelers and wranglers, and increases the need for crossing facilities.

Vegetation management actions designed to enhance vegetative conditions would increase forage production and vegetation age and structural diversity, which would improve livestock distribution and forage utilization. Vegetation treatment areas would receive short-term deferment to allow vegetation to recover; this would reduce forage available in the short term. However, enhanced forage availability and production would be realized over the long term with increased production and availability of herbaceous vegetation as dense and/or old shrub stands are treated. Achieving vegetation objectives would also result in grazing management adjustments, such as changes in the season and/or duration of use. Livestock adjustments would also be needed to meet Wyoming Standards for Healthy Rangelands (USDI, BLM 1997). Vegetation treatments would potentially improve vegetation composition and production in riparian areas and increase available stock water in areas that receive 14 inches or more of precipitation annually.

Prescribed fires would potentially displace livestock in the short term, as a result of activities associated with burning, and post-burn to provide for plant recovery. Forage for livestock grazing would be reduced during this same period. Over the long term, prescribed fire improves forage production and availability, which leads to better distribution of livestock use across the grazing area and often reduces their use and trampling along stream drainages. Prescribed fires can increase watershed yield (primarily at locations that receive 14 inches or more of annual precipitation) by reducing sublimation and transpiration while improving water infiltration. This would potentially increase stock water and sediment loads in the short

term. Although most sediment is caught by vegetation before it enters a channel, this would accelerate the rate at which stock ponds fill with sediment and lose capacity. Peak flows following extreme storm events would have an increased potential to damage water diversions and developments or other infrastructure downstream.

VRM classifications that restrict surface disturbing activities (VRM Class I in WSAs) or influence the size, design or location of surface disturbing activities (VRM Class II and III elsewhere) would indirectly help to maintain forage production, reduce the potential for noxious and invasive weeds, and meet the standards for rangeland health. Consideration of visual quality in VRM Class II or Class III areas (refer to Table 2-9 for acreages) would potentially influence the type, design, and/or location of proposed range improvements. This would rarely preclude development, but would affect the complexity of construction and/or maintenance to be consistent with the VRM standards.

Any project designed to enhance watershed and soils health would enhance vegetation resources by reducing erosion, which would have the indirect effect of increasing forage production for livestock. However, effects on livestock grazing would result from the need to adjust or modify current livestock management to achieve the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997). Protection of water quality, watershed, and soils health would in some cases require changes in livestock management, such as deferred or shortened grazing periods, riparian pastures, increased cattle herding, and upland water development. Management actions that result in increased water availability and forage production would indirectly affect livestock through improved livestock distribution and increased weight gain and conception rates. Produced water made available in contained water storage systems for livestock would increase available water for and improve distribution of livestock.

When livestock and wild horses occupy the same area, their needs for space, water, and forage would be competitive. The degree of competition would vary depending on the kinds of livestock and the season of use. The competition would be mitigated (when necessary) through adjustments in season of use and improved distribution of livestock. BLM would continue to monitor vegetation and habitat condition to ensure that a thriving natural ecological balance and the multiple-use relationship that existed in 1971 are maintained. Livestock operation flexibility would be reduced when requests for changes of livestock use are altered or denied if the requested change conflicts with wild horse management objectives. Maintenance of fences damaged by wild horses would be the responsibility of the livestock operator as would be the control of livestock within each allotment. Fences knocked down by wild horses would increase livestock mixing with other herds and lead to increased potential to be exposed to diseases and to breed at the wrong time or with the wrong individuals. This would potentially change the time at which cows calve, birth weights, and mortality rates of cow and calves. Where season of use by wild horses is being managed to meet Wyoming Standards for Healthy Rangelands, timing of water availability would potentially restrict livestock use. Livestock grazing would primarily be affected within HMAs; however, horses move out of HMAs into adjacent allotments. When this occurs, impacts to livestock management are expanded into these areas.

Introduction, transplantation, reestablishment, and augmentation of wildlife species would potentially influence the kind of livestock, management systems, or range improvements permitted. Fisheries actions, such as stream restoration and fish stocking or reintroduction, would have the potential to reduce available forage for livestock grazing through the construction of exclosures designed to protect water sources and plantings of woody species, and riparian pastures that alter the timing and duration of livestock use and provide for fish habitat. Protection measures in potential mountain plover occupied habitat (Appendix 16) and other special status species habitat (Appendices 1, 10, and 15) would be implemented on a case-by-case basis and would involve the least restrictive measure necessary to protect occupied habitat. Rarely, if ever, would plover protection measures preclude construction or development of livestock grazing range improvements. Intensive management of surface disturbing and disruptive

activities would potentially influence the location, construction timing, and cost of range improvements; however, range improvement would rarely be precluded.

4.7.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, cultural resource, and socioeconomics management would have little or no impact to livestock grazing. Impacts to livestock grazing management from paleontology, recreation, and wild horse management would be the same as those described under Impacts Common to All Alternatives above.

The use of fire for resource benefit would increase the size of wildland fires. Larger sizes of wildland fires would also result in modification of grazing systems on a short-term basis that would reduce flexibility and increase management complexity of livestock operations.

Practices associated with forest health improvement would result in mixed forest types and age class structure, which would reduce tree density and ground shading and maintain/increase forage production and availability for livestock use. Temporarily improved roads associated with timber harvesting are used by animals as travel corridors (particularly in steeper terrain) and as access for operators to check, provide supplements to, and move their livestock. Improved forage condition and access would promote better distribution of livestock use. Timber harvesting activities, such as sawing, skidding, and road building, would displace livestock temporarily and reduce forage available for grazing. Most roads and skid trails would be revegetated by natural processes, which would reestablish forage and increase production on the small areas that were disturbed.

Lands and realty management actions have identified approximately 61,010 acres of public lands suitable for disposal, which, if disposed, would reduce federal land grazing. However, most land disposals and exchanges are of isolated tracts, are of checkerboard landownership areas, or are close to towns. Land use would potentially switch from public to private land grazing or would change to industrial or urban development. The total acreage of lands lost to grazing use would be relatively small; therefore, the loss of AUMs would be minimal. These actions would help to block up public lands or dispose of small isolated tracts, which would improve management efficiency.

Livestock grazing management would result in 45 range improvements annually, consisting of a mixture of spring developments, reservoirs, wells, pipelines, new fence construction, and conversion projects. Conversions from cattle or sheep to domestic bison would be considered in all areas, which would maintain management flexibility. New fences constructed and existing fences modified to BLM standards would provide adequate livestock control.

Minerals management activities would create a total of 16,538 acres of long-term disturbances that would result in the loss of approximately 1,860 AUMs. The construction of roads and facilities would result in long-term disturbance that would reduce forage availability and palatability (as a result of dust on vegetation) and increase disturbance to livestock. Short-term disturbances of 61,895 acres would result in a loss of approximately 7,020 AUMs because of forage removal and livestock displacement. The short-term loss of AUMs would be mitigated through the reestablishment of forage following reclamation of pipelines and other temporary disturbances. The total effect on AUMs would be short term and would be mitigated through the reestablishment of forage following reclamation. In addition, these impacts would occur over a long time period and would be distributed across nearly 30 allotments. This would reduce the effects for any one livestock operator; however, temporary adjustments of use would potentially be implemented on some allotments.

Mining of other leaseable, salable, and locatable minerals would result in surface areas being disturbed and fenced out during mining and reclamation activities, which would result in a small loss of forage. Reclamation of these lands usually returns the grazing lands to production levels found prior to development.

OHV closures would total 23,020 acres that would preserve vegetation and forage in limited areas for livestock use. Continuing vehicular use in poor road locations contributes to the accelerated soil erosion and desertification associated with gullies that reduce forage production and availability for livestock use.

SD/MA management would be the same as described under Impacts Common to All Alternatives. In addition, the continued use of existing roads to check and move livestock, place salt, and maintain range improvements in the Ferris Mountain WSA would facilitate livestock management.

Vegetation treatments would occur on up to 56,000 acres over the next 20 years, which would initially remove plant cover in treated areas but provide additional long-term forage. However, in spite of this existing level of treatments, the seral condition class would remain predominantly late (e.g., dominated by mature to decadent vegetation). Herbaceous cover would continue to be inadequate for watershed protection and exhibit lower vigor and production, which would eventually decrease forage production and availability for livestock in areas not treated.

Special Status Plant Species management would preclude grazing when exclosures are required to protect habitat. Currently, 15 acres are excluded from grazing to protect Gibben's beardtongue (*Penstemon gibbensii)*. Management of Special Status Species and unique plant communities would potentially require changes in livestock management (e.g., season or duration of use) to improve the production and vigor of these species where fencing of populations would not be feasible.

In the areas that are treated for invasive weeds (2,800 acres per year, including rangeland treatments and mitigation for surface disturbance), weed proliferation would be controlled. In treated areas, forage production, diversity, and vigor would be maintained; however, approximately 15,000 weed-infested acres would remain untreated. Infested acreage would continue to result in a decline in forage production and devaluation of animal commodities (i.e., burrs in sheep wool). Untreated invasive poisonous plants would continue to injure and kill livestock, particularly sheep, which potentially would lead to further reductions in the sheep industry in this area. Livestock would be temporarily displaced during treatment activities. Livestock management flexibility would be reduced over the long term in untreated areas because of the presence of invasive weeds and the reduction of usable forage.

Restrictions in VRM Class II areas (359,610 acres) would potentially change the type, design, and/or location of proposed range improvements. This would not necessarily preclude development but would affect the complexity of construction and/or maintenance.

Surface discharge of produced water would be allowed, which would increase the availability of water, improve distribution of livestock grazing, and alter both forage availability and management flexibility. Existing vegetation would be lost through down cutting or become dominated by salt-tolerant species. When discharges fluctuate, vegetation composition would shift to favor weeds and other less palatable forage for livestock. Infiltration/evaporation reservoirs would remove vegetation and reduce available forage for livestock.

Animal damage control activities would be considered, which would allow livestock operators the flexibility needed to control predators and damage caused by wildlife. Sensitive wildlife habitat (e.g., greater sage-grouse leks, prairie dog towns, raptor nests, mountain plover habitat, and crucial winter range) protection measures or use restrictions would influence the location, construction timing, and cost

of range improvements. Seasonal restrictions would also delay surface disturbing activities from other program actions within domestic livestock calving or lambing areas (May and June), which would reduce potential mortality resulting from increased stress or displacement of livestock.

Modification of fences constructed prior to adoption of BLM standards (BLM Manual H-1741-1) would occur as needed. Modified fences would cause permittees to perform increased fence maintenance and to ride the area more frequently to ensure that livestock remain in the appropriate area because fences designed for wildlife passage are less effective in restraining livestock. However, the maintenance of newer fences constructed to BLM standards would be less time consuming and costly than the maintenance of older fences.

Summary

The introduction and proliferation of noxious and invasive weeds within individual allotments or localized areas would result in a reduction in available AUMs. Within some allotments, the practicality of running sheep would be reduced and in some cases eliminated in areas with invasive poisonous plants. Compounding this problem is the lack of sufficient weed treatments. Similarly, insufficient vegetation treatments are contributing to the continued trend in mature to decadent shrubland and woodland communities, which would result in lower herbaceous production over the long term and ultimately in reduced management flexibility.

Surface disturbing activities would reduce the amount of forage available to livestock. However, the long-term loss of approximately 1,860 AUMs from development represents only about one-third of a percent of all federal AUMs in the RMPPA, which would not be considered a major impact.

4.7.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, cultural resource, and socioeconomics management would have little or no impact to livestock grazing. Impacts to livestock grazing management from paleontology, recreation, and wild horse management would be the same as those described under Impacts Common to All Alternatives above.

Impacts from forest, OHV, water quality, SD/MA, and water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Impact from wildland fire and fuels management would be the same as in Alternative 1 except for the increased emphasis on fire suppression and decreased use of natural fire. Suppression activities would result in smaller size of fires, which would reduce forage loss, damaged fences, changes in grazing management, and the need for temporary fencing (to allow for recovery of plants). This would reduce management costs and maintain the flexibility of livestock operations. Reduced use of natural fire in the long term would result in decreased forage production and/or availability for livestock use (however, this would be compensated for with increased vegetation treatments described under the Vegetation Management section).

Lands and reality management actions would be similar to those in Alternative 1 except that approximately 14,780 fewer acres would available for disposal and there would be no preferred method of disposal. However, to maintain the forage base for livestock use, exchange would be preferred. If exchange were used, there would be minimal changes in AUMs, and administration issues would be decreased because scattered and isolated lands would be consolidated. If sales were used, there would be

a loss of public AUMs permitted by the BLM, although administration issues would still be decreased because checkerboard and isolated lands would no longer be managed by the BLM.

Livestock management actions would be similar to those in Alternative 1 except for the emphasis on increased livestock production. This would result in an increase from 45 to 55 rangeland improvement projects. These projects would emphasize reliable water development projects, which improve grazing distribution and reduce concentrated livestock trampling and forage utilization during drought periods. The implementation of grazing systems would promote increases in livestock weaning weights, conception rates, and animal health. New fence construction would decrease management complexity and indirectly help increase pasture and forage productivity with improved distribution of livestock.

The minerals management program would impact livestock grazing as in Alternative 1, except a greater amount of disturbance from oil and gas development would occur. A total of 17,013 acres of long-term disturbance would result in the loss of 1,880 AUMs. Short-term disturbance of 63,649 acres would result in a loss of 7,070 AUMs (50 more AUMs than under Alternative 1). The short-term loss of AUMs would be mitigated through the reestablishment of forage following reclamation.

Vegetation management actions would be similar to those in Alternative 1, except that the increase to 24,400 treated acres would result in increased forage availability and production. Treatments would also help maintain early seral conditions in aspen stands, increasing the herbaceous component of vegetation preferred by cattle. Prescribed burns in aspen and dense shrub stands would draw more livestock into these areas by increasing availability and production of herbaceous forage and reduce trailing and forage use along drainages. Long-term benefits would include increased weight gains, conception rates, and reduced health issues with livestock.

Sensitive plant species would not be protected, which would reduce the potential for plant exclosures or other livestock management restrictions.

Approximately 25,786 acres of weeds would be treated annually, which would reduce competition with native plants that are often desirable forage species. In the short term, some infested acreage would continue to result in a decline in forage production and devaluation of animal commodities. However, in the long term, treatments would slow the proliferation of existing weed species and the introduction of weed species into new areas, until all areas received treatments. Also, treatment of poisonous plants would result in lower livestock injury and death and reduce the need to avoid grazing infested locations.

Impacts from VRM would be similar to those in Alternative 1, except that the reduction in VRM Class II area (to 232,830 total acres) would allow greater flexibility in type, design, and/or location of proposed range improvements.

Impact from wildlife management actions would be similar to impacts described in Alternative 1, except that the removal of timing stipulations for non-federally protected species would allow for longer construction periods for range improvements in these areas. However, surface disturbing activities from other program actions within livestock calving and lambing areas (May and June) would potentially increase stress, displacement, and mortality of livestock. The reduced distance stipulation and a more flexible timing stipulation for protection of nesting raptors would allow additional flexibility for the construction of range improvements.

Summary

In the long term, forage quality and quantity would be improved overall as a result of substantial increases in both vegetation and weed treatments. The reduction and elimination of wildlife mitigation measures

affecting range improvements would increase flexibility in livestock management. Increased surface disturbing activities would increase long-term AUM loss to 1,880 AUMs, which would result in a slightly greater loss of forage, but would still be less than 1 percent of total AUMs for the RMPPA.

4.7.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from cultural resource management would have little or no impact to livestock grazing. Impacts to livestock grazing management from paleontology and recreation would be the same as those described under Impacts Common to All Alternatives above.

Impacts from fire and fuels management would be similar to those under Alternative 1, except that more acres of wildland fire would be allowed to burn for resource benefit. This would result in additional areas requiring rest from livestock grazing to allow recovery of vegetation following a wildland fire, which would reduce the flexibility of livestock operations in the short term.

Forest management actions would allow natural succession to occur while managing for healthy forests. This would result in a mature forest consisting of an older age class structure and species dominance of fir and spruce, with lower composition of aspen and pines, and would reduce forage production and quality for livestock use. Lack of commercial timber harvest would reduce disturbance from roads and maintain vegetation for forage, although there would not be improved distribution of livestock and vehicle access to check, doctor, and move livestock as a result of new or improved roads. Forage production and availability would be reduced where undesirable conifer tree species are encroaching into old clear-cuts, aspen woodlands, dry meadows, and rangeland areas.

Impacts from lands and realty management would be similar to those identified in Alternative 1, except that lands would not be considered for disposal. Thus, the loss of AUMs for livestock grazing from the possible disposal of lands would not occur. However, as private lands associated with checkerboard and isolated BLM-administered public lands are subdivided and sold, the grazing privileges associated with these public lands would potentially no longer be accessible for grazing use. This action would remove the ability to block up public lands or dispose of small isolated tracts, which would not improve management efficiency and flexibility.

Impacts from livestock management actions would be similar to those in Alternative 1, except that livestock operations would incur additional management complexity to meet DPC objectives. One example where managing to meet DPC objectives would positively impact livestock grazing is the increase in shade provided by willows and water birch within riparian areas and an expanded forage base as stream channels narrow and the functioning width of riparian habitat expands. However, there would be a reduction in herbaceous forage availability as the density of woody plants increases. The emphasis of range improvement projects would shift to modification of existing fences and small-scale spring/seep developments (rather than reservoirs and pipelines). This would emphasize enhancement of vegetation, watershed, and wildlife resource values and would result in fewer new projects to benefit livestock. Conversions of cattle or domestic sheep to bison would not be allowed in identified areas of blocked public lands for public safety. Restricting the type of livestock that managers permit in these areas would reduce the flexibility of livestock operations.

The minerals management program would have similar impacts on livestock grazing as under Alternative 1, except that a lesser amount of disturbance from oil and gas development would occur. A total of 15,489 acres of long-term disturbance would result in the loss of 1,730 AUMs. Short-term disturbance of 56,505 acres would result in a loss of 6,220 AUMs (800 fewer AUMs than under

Alternative 1). The short-term loss of AUMs would be mitigated through the reestablishment of forage following reclamation.

Impacts from OHV use would have similar impacts on livestock grazing as under Alternative 1, except that OHV closures would increase to 71,980 acres. Closing additional areas to OHV use would further preserve vegetation and forage for livestock use. The use of designated roads and vehicle routes would result in closure (and reclamation) or road maintenance of existing roads in poor locations, which would eliminate or minimize loss of forage production or availability for livestock use.

Impacts from SD/MAs would have similar impacts on livestock grazing as those identified for Alternative 1, except that the closure of road access within the Ferris Mountain WSA would prohibit vehicle use to maintain fences, check livestock, and distribute supplements, which would increase the time and cost for maintenance, fence conversion, and other livestock management activities. Additionally, the historic JO Ranch buildings in the Sand Hills ACEC would be used as an interpretive site for historic/working ranch operations, which would increase public visitation and potentially alter management of the ranch.

Vegetation would be managed to meet DPC objectives, which would require livestock operations to incur additional management complexity. Examples of this would include adjustments in season or duration of use, rest from livestock use, additional herding, offsite water developments, and pasture fencing. In most cases, there would be improved forage production that would result in increased weight gains or other benefits to the livestock operation.

A fivefold increase in the number and acres of vegetation treatments to 11,800 acres per year would occur with an emphasis on small, mosaic pattern of treatments, which would result in increased forage availability and production and better distribution of grazing use. However, the increase in acres treated by vegetation treatments would also reduce management flexibility to the livestock operator because treatments would be smaller and more frequent and subsequent additional periods of deferment for plant recovery would be required.

Weed treatments would occur on 28,542 acres annually for noxious and invasive weeds, which would result in a long-term reduction of most invasive weeds found in grazing allotments. This would reduce the effect weeds have on livestock management and production. Increased emphasis on weed management for native, weed-free communities would maintain forage for livestock grazing.

The increase in VRM Class II acres (to 351,050 total acres) would affect proposed range improvements needed for livestock management. New range improvements would have to be moved or altered if they happen to fall into the expanded viewsheds. However, mitigation should enable most fence and water improvement projects to proceed, but would potentially increase construction and/or maintenance cost to livestock operators. Construction activities from other resource programs would also have to be mitigated, which would potentially result in a reduction in the amount of forage lost as compared with Alternative 1.

Water impoundments, including reservoirs and spreader dikes, that would result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek within the Muddy Creek Watershed (Map 2-20) would be prohibited. This would eliminate the potential to construct impoundments which would hold water during drought periods, create more palatable and productive vegetation, and maintain flexibility in livestock grazing management.

Surface discharge of produced water would not be allowed in the Colorado River Basin and would be limited in the North Platte and Great Divide Basins, which would limit some dispersed water sources and fail to increase the availability of water or improve distribution of livestock grazing and management flexibility.

Provisions to protect municipal water sources in the Encampment River watershed would result in more intensive grazing management in this area, such as adjustments in the timing of use, which would reduce flexibility in the livestock operations using this area.

Actions identified as necessary to preserve the New World Iberian Genotype in the Lost Creek HMA would constrain future livestock management options within one (or possibly two) allotment(s). These actions would include increases in the Appropriate Management Level (AML) (approximately 165 adult wild horses) and reductions in forage available for livestock, modification of existing or limiting of new range improvements, and restrictions in requests for conversion of sheep to cattle AUMs and/or adjustments in existing livestock permits.

Impacts from wildlife management actions would be similar to those described in Alternative 1, except that prohibiting the United States Department of Agriculture (USDA) Wildlife Services from animal damage control activities would result in a reduction or elimination of sheep operations on public lands in 17 allotments because of unacceptable livestock losses due to predation. This would result in an inability to use between 20,000 to 30,000 AUMs for sheep, with limited potential to convert these AUMs to cattle use. There would also be an increase in the loss of cattle to predation, especially during calving. Construction of range improvement projects would have greater limitations and/or mitigation requirements because of more protective wildlife restrictions. This would result in less flexibility in scheduling seasonal work and in design and location of projects, increased fence maintenance, and increased livestock herding. Changes in grazing systems and development of new range improvements would not be allowed unless there were associated wildlife benefits. Water developments in big game crucial winter range and new fences in migration corridors would not be allowed, which would reduce livestock management flexibility.

The reintroduction of Colorado River cutthroat trout (CRCT) and other native fish species would potentially change livestock management in areas where these species are reintroduced. Management and planning changes would include altering grazing season and duration of use as well as additional construction of offsite water sources, riparian pastures, and exclosures.

Summary

The inability to use up to 20,000 to 30,000 AUMs for sheep as a result of lack of predator control would be a significant impact on up to 17 grazing allotments.

Long-term forage production and availability would be improved overall, as a result of substantial increases in both vegetation and weed treatments. Loss of forage use caused by surface disturbing activities would be reduced from the level in Alternative 1 because of reclamation activities, weed control, and restrictions on surface disturbing activities from VRM Class II designations and wildlife management actions.

4.7.5 Impacts Under Alternative 4: Proposed Plan

Impacts from cultural resource management and wild horse management on livestock grazing would be the same as under Alternative 1. Impacts to livestock grazing management from SD/MA management and wild horse management would be the same as those described under Impacts Common to All Alternatives above. Livestock grazing management action impacts would be the same as those described under Alternative 3.

Impacts from fire and fuels management would be similar to those under Alternative 1, except that fuel treatments would increase four to eight times, resulting in an overall shift in plant communities to more

early- and mid-seral conditions, which would increase grasses for forage. There would also be a decrease in dense shrub stands, thereby improving livestock distribution and access to forage.

Forest management action impacts would be the same as those described under Alternative 1, except that 6,700 acres would be eliminated from commercial timber harvest. Restricted commercial harvest on steep slopes and other sensitive areas would reduce disturbance from the improvement of temporary roads and maintain vegetation for forage.

Approximately 46,230 acres would be suitable for disposal, which, if disposed, would reduce federal land grazing. However, most land disposals and exchanges are of isolated tracts, are of checkerboard landownership areas, or are close to towns. Land use would potentially switch from public to private land grazing or would change to industrial or urban development. The total acreage of lands lost to grazing use would be relatively small; therefore, the loss of AUMs would be minimal. These actions would help to block up public lands or dispose of small isolated tracts, which would improve management efficiency.

Impacts resulting from minerals management on livestock grazing would be fewer than those in Alternative 1. A total of 15,472 acres of long-term disturbance would result in the loss of 1,730 AUMs. Short-term disturbances of 57,819 acres would result in a loss of 6,430 AUMs (about 590 AUMs fewer than in Alternative 1). The short-term loss of AUMs would be mitigated through the reestablishment of forage following reclamation. A long-term loss of AUMs would not be anticipated; however, temporary adjustments of active use would potentially occur.

OHV closures would increase to 46,370 acres, which is about 50-percent more area than under Alternative 1. Closing areas to OHV use would preserve vegetation and forage for livestock use.

In addition to impacts common to all from SD/MAs, development of an interpretive program for the historic JO Ranch in the Sand Hills ACEC would increase public visitation and would potentially alter management of livestock grazing in close proximity to the JO Ranch headquarters to achieve objectives for cultural and recreation values.

Vegetation treatments would increase to 16,400 acres and would emphasize meeting multiple-use objectives while providing for the protection of Special Status Species. Treatments would increase production and availability of forage, would improve distribution of use, and would potentially increase weight gains and conception rates in livestock. In addition, to meet DPC objectives, more intensive management would potentially be required.

Treatment of 25,023 acres of weeds annually with an emphasis on outbreaks in native, weed-free areas would reduce competition with native plants. In the short term, some infested acreage would continue to result in a decline in forage production and devaluation of animal commodities. However, in the long term, treatments would slow the proliferation of existing weed species and the introduction of weed species into new areas. Treatments would target removal of new weed infestations and control of large patches. This would increase forage available for livestock use.

Impacts from VRM would have the same impacts as those described under Alternative 1, except that the VRM Class II areas (346,670 total acres) would be slightly reduced.

Water quality, watershed, and soils management actions would have the same impacts as those described under Alternative 3, except that water impoundments that would result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek located within the Upper Muddy Creek/Grizzly WHMA would be prohibited. This would reduce the flexibility of management during periods of drought or require the use of wells, pipelines, and water hauling to provide additional reliable

water sources. For surface discharged produced water, impacts would be the same as those described under Alternative 1.

Impacts from wildlife management actions would be similar to those impacts described in Alternative 1, except that the reintroduction of CRCT and other native fish species would potentially result in changes in livestock management in areas where these species are reintroduced. Management and planning changes would include altering grazing season and duration of use as well as using riparian pastures and exclosures to meet wildlife related goals and objectives.

Summary

Long-term forage production, quality, and availability would be improved overall, as a result of substantial increases in both vegetation and weed treatments. However, 5,000 to 7,000 acres of existing weed patches would remain untreated, which would not slow the proliferation of weeds and would reduce usable forage for livestock and increase animal mortality.

Loss of forage use as a result of surface disturbing activities would be reduced from the level in Alternative 1 because of reclamation activities, weed control, and restrictions on surface disturbing activities resulting from VRM Class II designations and wildlife management actions.

4.8 MINERALS

The overall goal of the minerals program is to make mineral resources available from BLM-administered lands while minimizing impacts to the environment, public health and safety, and other resource values and uses. Mineral resources are not evenly distributed throughout the RMPPA. This section presents potential impacts on minerals development from management actions for other resource programs. Existing conditions concerning minerals are described in Section 3.8. Impacts to minerals are organized as follows: (1) leaseable minerals, (2) locatable minerals, and (3) salable minerals. The location of oil and gas fields is presented on Map 3-5.

Significance Criteria

Impacts to minerals would be considered significant if either of the following were to occur:

- Management actions cause a substantial reduction in federal leasing and development activities.
- Management actions cause a substantial reduction in the development of locatable and salable minerals.

The Statement of Adverse Energy Impacts specified in Executive Order 133212 is no longer required. Changes in anticipated oil and gas production levels associated with each alternative are discussed in the sections below that analyze impacts associated with each alternative.

Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of resources and the project area, review of existing literature, and information provided by other agencies. Effects are quantified where possible. Spatial analysis was conducted using ESRI's ArcGIS Desktop 9.1 computer software. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or are described in qualitative terms, if appropriate.

Reductions in the number of well locations (and potential surface disturbance) from the baseline RFD scenario (Appendix 20, Oil and Gas Operations, Production) for each alternative are a result of proposed management actions, mitigation measures, and BMPs presented in Table 2-1, Detailed Comparison of Alternatives, and various appendices. Those protective measures can affect oil and gas development activities by not allowing leasing, restricting surface occupancy, controlling surface use, or adding restrictive mitigation to Conditions of Approval on federal Applications for Permit to Drill. For RFD scenario analysis purposes, the restrictions were separated into four classifications described in Table 2-1. After the acres of federal oil and gas resources were calculated for each classification by alternative, the percent reduction in well numbers for each classification by alternative was estimated. This estimate is a percentage of the well numbers and surface disturbance that would not occur under each alternative (Appendix 20). The effects of the various restrictions are depicted using the change in oil and gas production that results from all management actions.

The number of wells projected to be drilled under each alternative is used to estimate potential impacts to other resources. These well numbers provide an easy but incomplete picture for estimating impacts because multiple wells can be drilled from the same surface location. Well locations (as opposed to well numbers) are an indicator of human presence or disruptive activity and related impacts. The other major component of the fluid mineral RFD scenario is surface disturbance related to the construction of exploration and development wells and associated infrastructure. Surface disturbance associated with oil and gas development activity is the primary barometer of impacts to other resources. Surface disturbance

varies by type of well (conventional versus CBNG) because well pad size may vary and multiple wells may be drilled from one surface location. The estimate of surface disturbance by alternative is included in the RFO final RFD report (which can be found on the Rawlins BLM RMP website); these estimates are included in Appendix 33, Reasonably Foreseeable Development and Reasonably Foreseeable Actions Tables.

Many variable circumstances could increase or decrease the level of drilling activity and associated surface disturbance acreage throughout the expected life of the RMP. If the projections in the RFD prove to be inaccurate, then BLM will evaluate the RMP when the well numbers or surface disturbances in the RFD are approached to determine if a plan amendment or revision is warranted. Every subsequent action must be consistent with the RMP, and that consistency is checked in every National Environmental Policy Act (NEPA) document BLM completes.

In addition to the number of oil and gas wells and the surface disturbance estimated for the various alternatives, the location of the oil and gas activity is important to the analysis of impacts to other resources. The majority of the oil and gas exploration and development is projected to occur in areas currently experiencing oil and gas development, based on high and moderate oil and gas potential. Many, if not most, of the wells drilled will be infill wells within existing areas of production. Current oil and gas field development project areas and current oil and gas well locations are depicted on Map 4-7 along with the high and moderate oil and gas potential areas. Map 4-7 identifies the areas within the RMPPA most likely to experience future oil and gas development activity.

The analysis is based on the following assumptions:

- Oil and gas leasing, exploration, and development could occur throughout the entire RMPPA, except where restricted.
- The number of oil and gas wells proposed under each alternative that would be drilled over the next 20 years in the RMPPA includes 8,945 wells (3,834 federal) under Alternative 1; 9,198 wells (4,087 federal) under Alternative 2; 8,632 wells (3,521 federal) under Alternative 3; and 8,822 wells (3,711 federal) under Alternative 4 (Appendix 33). Because of the high potential for future development, the RFD scenario for oil and gas includes federal and nonfederal wells in the checkerboard area.
- Nonfederal well numbers (5,111 wells) and disturbance acreage (35,000 acres) are assumed to be the same for all alternatives.
- Sixty-eight percent of the federal wells drilled would be in the checkerboard area of the RMPPA.
- Based on historical drilling data, 75 percent of the future conventional wells are expected to be drilled in Townships 14–24 North and Ranges 90–96 West.
- No substantial development potential is foreseen for locatable minerals. There are currently four active Plans of Operation for uranium exploration, one active Notice for uranium exploration, and one active Notice for gold exploration.
- Locatable mineral exploration and development proposals, if they should occur, are subject to specific legal mandates such as protecting T&E animal and plant species, water, air, and cultural resources. All proponents, for projects of any size, are subject to legal action for violating any laws. For project proposals of fewer than 5 acres of surface disturbing activities, proponents are required to notify the BLM and may be subject to ESA and cultural requirements. However, they are not legally bound to follow administrative protection established for other resources unless the projects are proposed in an ACEC, part of the WSR system or Wilderness Preservation

system (or a proposed addition), a National Monument or National Conservation Area, or an area designated as "closed" to offroad vehicle use, or where the operator is proposing bulk sampling of more than 1,000 tons of material. If any of these described conditions exist, then an operator must file a 43 CFR 3809 Plan of Operations that is subject to BLM approval and the addition of any mitigation or restrictions deemed necessary.

- No reasonably foreseeable coal development is anticipated other than on the existing lease in Carbon Basin (Section 4.20, Cumulative Impact Analysis). Reclamation would continue in the Hanna Basin from past coal mining.
- Demand for salable minerals over the next 20 years would follow the rate of resource development in a given area. New sales could be requested in order to establish closer proximity to development areas.
- Reasonable measures would be required by the Authorized Officer to minimize adverse impacts to other resource values, land uses, or users not addressed in the lease stipulations at the time operations are proposed. Reasonable measures could include modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. These modifications might occur only through site-specific post-lease actions (e.g., Applications for Permit to Drill [APD] and ROWs) that are supported by onsite conditions and/or project-specific NEPA analysis. Modification and/or waivers to lease terms and stipulations can be accomplished in accordance with applicable regulatory guidelines (Appendix 9). Surface disturbing and other disruptive activities could occur at existing authorized facilities.
- RFD/RFA tables can be found in Appendix 33.

4.8.1 Impacts Common to All Alternatives

Forest management, national natural landmarks management, and WSR management actions are unlikely to impact mineral development activities.

Leaseable Minerals—Oil and Gas

BLM would maintain or enhance air quality levels, within the scope of its authority, by minimizing emissions that may cause violations of air quality standards or degrade visibility. These activities would potentially limit oil and gas exploration and development activities in certain areas. Necessary mitigation would be applied as discussed in Appendix 4, Air Quality Impact Technical Support Document.

Cultural resource management would influence the timing, location, size, and coloration of oil and gas facilities but would rarely preclude the development or completion of oil and gas activities. In most cases, oil and gas facilities would be relocated to avoid disturbance to cultural resources. In areas where the integrity of the setting contributes to NRHP eligibility, well site proposals resulting in visual elements that diminish the integrity of a property's setting would be redesigned according to applicable requirements (Appendix 5).

Fire and fuels management would concentrate fire suppression in areas with high resource or human value, including oil and gas development areas and infrastructure. Wildland fires when they occur generally cause minimal indirect impact on the development and production of oil and gas resources, but they can be devastating when they occur. Health and safety impacts for oil and gas personnel can be significant. Fuel treatments designed to reduce fuels and meet other multiple-use resource objectives would benefit oil and gas production by reducing wildland fire size and intensity, thereby reducing the threat of loss of oil and gas facilities to wildland fire where possible.

Lands and realty management actions could influence oil and gas activities in some situations. Corridors established for utility/transportation systems (power lines, pipelines, and other linear-type ROWs) and ROWs for existing linear transmission facilities would be avoided where possible for the placement of oil and gas development activities and infrastructure. Oil and gas facilities would not be placed immediately adjacent to corridors or linear ROWs if issues with safety or incompatibility were identified. This would relocate, but rarely preclude, any oil and gas facility. ROWs for wind energy development would influence oil and gas development in areas where project proposals would occupy the same areas. Conflicts and necessary mitigation would have to be worked out on a case-by-case basis. The revocation of certain withdrawn lands in the Seminoe and Savery-Pothook areas would potentially allow the opportunity to place oil and gas infrastructure on these lands previously withdrawn for BOR water management projects.

Livestock grazing mitigation measures applied to the oil and gas program would increase the operational complexity in order to provide for the protection of livestock watering facilities and monitoring sites, upkeep and repair of fences/gates and cattle guards affected by oil and gas activities, control of invasive (poisonous) weeds, minimization of forage loss, and prevention of mortality or injury to livestock.

Minerals resource management impacts associated with the development of other mineral resources would be minimal. In these types of situations, conflicts between fluid mineral development and other mineral development (primarily locatable minerals) would generally be handled on a case-by-case basis. Regulations preclude the waste of any public resource and in most situations compromises would be reached that affirm the ability of mineral developers to produce the mineral resources. A time delay on the part of one developer often provides a workable solution. If a legal battle does occur, the person with the prior right may have the advantage. This could be particularly true in a case involving leaseable and locatable minerals where the date on which claims were located might establish a priority right compared to the date when a lease was issued. Existing withdrawals of 935,530 acres, primarily from locatable mineral entry (Table 3-4), as well as the low potential for locatable development, would reduce the potential for conflict between fluid minerals and development of other mineral resources.

OHV use for “necessary tasks,” such as geophysical exploration including project survey and layout, would allow for the orderly and efficient completion of oil- and gas-related tasks.

Paleontological resource management impacts on oil and gas exploration and development would be minimal. If important scientific fossils were discovered as a result of inventories conducted in association with surface disturbing activities, the resource would be managed according to BLM procedures. Avoidance of important paleontological resources would relocate oil and gas facilities or oil and gas facility placement would be delayed while paleontological resources are collected and removed. Relocation of proposed access roads, drill pads, pipelines, and other ancillary facilities would cause temporary delays in developing oil and gas resources.

Existing recreation sites and management areas (6,076 acres, primarily in low hydrocarbon potential areas) would preclude oil and gas activities within a relatively small area that makes up individual recreation sites. Only minor relocation or avoidance of developed and undeveloped recreation sites would be required because of no surface occupancy restrictions.

Only the Adobe Town WSA, which is closed to leasing, is situated in an area considered to have at least moderate potential for the presence of oil and gas resources (Map 4-7). WSAs totaling 64,150 acres are closed to federal mineral leasing (Map 2-6), thus precluding new oil and gas leasing and development activities in these areas. Approximately 37,100 acres of the WSAs have a moderate hydrocarbon potential, and approximately 27,050 acres have a low hydrocarbon potential (Table 2-6).

The establishment of SD/MAs would require the intensive management of oil- and gas-related surface disturbing and disruptive activities to reduce impacts to sensitive vegetation complexes, important cultural properties and their visual settings, and sensitive or important wildlife habitats that have high or moderate potential for oil and gas development. The extent of any impacts common to all alternatives varies according to the actions identified for each SD/MA. The Sand Hills, Red Rim-Daley, Cow Butte/Wild Cow, Jep Canyon, Upper Muddy Creek, Chain Lakes, and Historic Trails SD/MAs would have the most potential to influence the location, design, size, and coloration of oil and gas development activities (Maps 2-8, 2-12, and 4-7).

Transportation and access management actions for maintenance of the public land transportation system would provide for public safety and adequate access for mineral development tasks. Industry would, in most cases, use the existing state, county, or BLM transportation network for initial access to potential oil and gas exploration sites, access for geophysical exploration, etc. Once oil and gas exploration and development activities were approved by BLM, industry would be required to improve and maintain existing BLM roads or develop new roads and routes to meet development and operational needs.

Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas to preexisting native plant species and eliminate weeds (Appendix 36). Habitat containing Special Status Plant Species (Appendix 10) would potentially limit the location of fluid mineral development activities within any oil and gas lease.

VRM would affect the placement of facilities associated with minerals exploration and development activities on the public lands and could exert a definite influence on finding acceptable locations where development might occur as well as the size and coloration of facilities depending on the visual class and location.

Water quality, watershed, and soils management actions such as avoiding areas within specified distances of ephemeral streams, live water (springs, rivers, and creeks), etc., and unstable areas such as landslides, slumps, and steep slopes would restrict but not preclude the ability to explore for and develop fluid minerals in most areas. This mitigation is applicable to all proposed well sites and surface disturbing activities and would limit the location of oil and gas wells and associated infrastructure in areas where these conditions exist. In most cases, the well pad or facility would be placed outside the avoidance area. If the protected resources cannot be avoided, an alternative site using appropriate measures necessary to mitigate impacts to other resources would be proposed. The application of various BMPs or other measures that would be attached to the APD as conditions of approval (Appendices 1, 13, and 15) would influence how an activity is accomplished but rarely preclude the activity from occurring. Such management actions in complex areas involving several resources would potentially limit the number of well pads.

Wild horse management (horse roundups) would potentially delay oil and gas exploration and development activities for a few days per location. Location of permanent wild horse trap sites would preclude oil and gas activities.

Management actions that include the introduction, transplant, establishment, augmentation, and/or stocking of wildlife does not often occur within the oil and gas developed fields; however, in the event these actions do occur they may occasionally influence the timing and location of oil and gas development. Intensive management in RCAs potentially would require the relocation of proposed facilities away from nesting substrates and ensure that development is restricted to non-breeding or nesting periods of the year. Wildlife habitat and forage requirements would influence the use of appropriate seed mixes and planting techniques that add additional time and effort to reclamation activities.

Management actions that consider maintenance of connectivity between large, contiguous blocks of undisturbed habitat would result in modification of facility locations and minimization of construction disturbance. Within the constraints of existing lease rights, surface facilities would be located to avoid fragmentation of habitat, where possible. Applicable mitigation measures and BMPs would delay oil and gas development activities by precluding activity in certain areas and during certain times of the year to allow wildlife to complete breeding, nesting, and other important life-cycle processes. Avoidance of important or sensitive habitats (rock outcrops, aspen stands, lek sites, and other potential breeding and nesting substrates) would influence access routes and facility placement in Critical habitat areas.

Proposed protection measures implemented to reduce and/or eliminate potential impacts to occupied mountain plover habitat (Appendix 16) would delay development in some areas. These requirements influence, but rarely preclude, the placement of mineral exploration and development activities in areas where mountain plover are present.

Leaseable Minerals—Coal

No coal development (except in the Carbon Basin where federal coal lands have already been determined acceptable for further leasing consideration) is expected during the 20-year life of the RMP. Only the first two steps of the coal screening process (Appendix 2) have been conducted on federal coal lands. A determination was made that approximately 5,029 acres were unsuitable (Appendix Maps A2-2, A2-3, and A2-4) for surface coal mining. Approximately 56,240 acres were identified as acceptable for further leasing consideration pending application of the remaining coal screens. The only coal activity analyzed is reclamation activity in the Hanna Basin.

Fire and fuels management and vegetation management would potentially influence reclamation activities in the Hanna Basin. Wildland fire management within the RMPPA would concentrate fire suppression in areas with high resource or human value, including resource development. Fire management would benefit reclamation activities by reducing fire danger. Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas to preexisting native plant species and eliminate weeds (Appendix 36). Habitat containing Special Status Plant Species (Appendix 10) would potentially change reclamation methods for leaseable mineral development activities.

Locatable Minerals

Impacts to locatable mineral development would be limited because of the relatively minor amount of locatable mineral exploration anticipated to occur under the RFD scenario presented in Appendix 33.

BLM would maintain or enhance air quality levels, within the scope of its authority, by minimizing emissions that may add to acid rain, cause violations of air quality standards, or degrade visibility. These activities would potentially limit or modify locatable mineral exploration and development activities in certain areas. Necessary mitigation would be applied as discussed in Appendix 4, Air Quality Impact Technical Support Document.

Management of cultural resources could influence locatable mineral development activities. In areas where the integrity of the setting contributes to NRHP eligibility, proposals involving surface disturbance that result in visual elements that diminish the integrity of the property's setting would be limited according to applicable requirements (Appendix 5).

Fire and fuels management would concentrate fire suppression in areas with high resource or human value, including minerals infrastructure. Wildland fires when they occur generally cause minimal indirect

impact on the development and production of mineral resources. Health and safety impacts for personnel can be significant. Fuel treatments designed to reduce fuels and meet other multiple-use resource objectives would benefit mineral production by reducing wildland fire size and intensity, thereby reducing the threat of loss of mineral facilities to wildland fire.

Lands and realty management actions would result in minimal impacts because access and the establishment of the infrastructure for locatable mineral development are authorized under the provisions of the 1872 Mining Law and the 43 CFR 3809 surface management regulations. Existing withdrawals of approximately 935,530 acres would limit the land available for locatable mineral entry.

Livestock grazing mitigation measures applied to locatable mineral activities involving 5 acres or more would increase the operational complexity in order to provide protection of livestock watering facilities and monitoring sites, upkeep and repair of fences/gates and cattle guards affected by locatable mineral activities, control of invasive (poisonous) weeds, minimization of forage loss, and prevention of mortality or injury to livestock.

Mineral resource impacts associated with the development of other mineral resources would be minimal. In these types of situations, conflicts would generally be handled on a case-by-case basis. Regulations preclude the waste of any public resource, and in most situations compromises would be reached that affirm the ability of mineral developers to produce the mineral resources. A time delay on the part of one developer often provides a workable solution. If a conflict arises, the party with the prior right may have the advantage. This could be particularly true in a case involving leaseable and locatable minerals where the date on which claims were located might establish a priority right compared to the date on which a lease was issued.

OHV management would potentially affect some locatable mineral exploration activities by limiting times or places where vehicles could travel. Vehicle use for “necessary tasks,” such as geophysical exploration including project survey and layout, would aid in the access to, and exploration for, locatable minerals.

Paleontological resource management impacts on locatable mineral exploration and development would be minimal. If important scientific fossils were discovered as the result of inventories conducted in association with surface disturbing activities, the paleontological resource would be managed according to BLM procedures. The Federal Government bears the responsibility and would cover the costs associated with investigations and salvage of paleontological resources at the Notice level or after a Plan of Operations has been approved. Avoidance of important paleontological resources would possibly delay locatable mineral exploration and development activities while paleontological resources are collected and removed. Relocation of proposed access roads, drill pads, and other ancillary facilities would potentially cause delays in developing locatable mineral resources.

Developed and undeveloped recreation sites (9,660 acres) could limit locatable mineral exploration and development in some areas. Recreation sites would be withdrawn from locatable mineral entry, which would reduce the land available for exploration of locatable minerals.

The establishment of SD/MAs would require the intensive management of locatable mineral-related surface disturbing and disruptive activities to reduce impacts to sensitive vegetation complexes, important cultural properties and their visual settings, and sensitive or important wildlife habitats. The extent of any impacts varies according to the actions identified for each SD/MA. Specific closures to locatable mineral entry and requirements for Plans of Operation are discussed for each SD/MA by alternative below.

Red Rim-Daley Potential ACEC (11,100 acres) is open for metalliferous locatable minerals, but it is closed to non- metalliferous locatable minerals.

Transportation and access management actions for maintenance of the public land transportation system would provide for public safety and adequate access for mineral development tasks. Industry would, in most cases, use the existing state, county, or BLM transportation network for initial access to potential mineral exploration and development sites, access for geophysical exploration, etc. Once mineral exploration and development activities were approved by BLM, industry would be required to improve and maintain existing BLM roads or develop new roads and routes to meet development and operational needs.

Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas to preexisting native plant species and eliminate weeds (Appendix 36). Habitat containing Special Status Plant Species (Appendix 10) would potentially limit the location of locatable mineral exploration and development activities.

VRM would affect the placement of facilities associated with minerals exploration and development activities on the public lands and could exert a definite influence on finding acceptable locations where development might occur as well as the size and coloration of facilities depending on the visual class and location.

Water quality, watershed, and soils management actions such as avoiding areas within specified distances of ephemeral streams, live water (springs, rivers, and creeks), etc., and unstable areas such as landslides, slumps, and steep slopes would restrict but not preclude the ability to explore for and develop locatable minerals. Avoiding water resources in areas would mean modifying the methods of extracting locatable mineral projects of more than 5 acres. The application of various BMPs or other mitigation measures would be attached to the approval of projects of more than 5 acres (Appendices 1, 13, and 15) and would influence how a project is accomplished but rarely preclude the project from occurring.

Wild horse management (horse roundups) would potentially delay locatable mineral exploration and development activities for a few days per location. Location of permanent wild horse trap sites would preclude locatable mineral activities.

Management of wildlife resources would result in modification of locations and designs and minimization of construction disturbance when possible to maintain connectivity between large contiguous blocks of habitat, protect sensitive wildlife habitat, and reduce repeated human presence in crucial raptor habitats and migration corridors. Mitigation would limit locatable mineral development activities by using withdrawals, not allowing surface occupancy, controlling surface use, or placing other restrictive stipulations on 43 CFR 3809 Plans of Operation approvals. Applicable mitigation would possibly delay or postpone some locatable mineral development activities by precluding activity in certain areas and during certain times of the year to allow for completion of breeding, nesting, and other important life-cycle processes. Avoidance of important or sensitive habitats (rock outcrops, aspen stands, lek sites, and other potential breeding and nesting substrates) would influence access routes and facility placement in Critical habitat areas. Wildlife habitat and forage requirements would influence the development of appropriate seed mixes and add additional time and effort to reclamation activities.

Salable Minerals

BLM would maintain or enhance air quality levels, within the scope of its authority, by minimizing emissions that may add to acid rain, cause violations of air quality standards, or degrade visibility. These

activities would potentially limit salable mineral activities in certain areas. Necessary mitigation would be applied as discussed in Appendix 4, Air Quality Impact Technical Support Document.

Management of cultural resources could influence salable mineral development activities. In areas where the integrity of the setting contributes to NRHP eligibility, proposals involving surface disturbance resulting in visual elements that diminish the integrity of the property's setting would be limited according to applicable requirements (Appendix 5).

Fire and fuels management would concentrate fire suppression in areas with high resource or human value, including minerals infrastructure. Wildland fires when they occur generally cause minimal indirect impact on the development and production of mineral resources. Health and safety impacts for personnel can be significant. Fuel treatments designed to reduce fuels and meet other multiple-use resource objectives would benefit mineral production by reducing wildland fire size and intensity, thereby reducing the threat of loss of mineral facilities to wildland fire.

Lands and realty actions could influence salable mineral activities in some situations. Areas closed to locatable mineral entry are also generally unavailable for the development of salable minerals. Operations located around incorporated cities/towns would be subject to intensive management if they are allowed at all. Other avoidance areas associated with utility/transportation systems management actions could preclude salable mineral development activities.

Livestock grazing mitigation measures applied to the salable minerals program would increase the operational complexity in order to provide protection of water facilities and monitoring sites, upkeep and repair of fences/gates and cattle guards affected by salable mineral activities, control of invasive (poisonous) weeds, minimization of forage loss, and prevention of mortality or injury to livestock.

Minerals management impacts associated with conflicts between salable and other types of mineral resources would be minimal. In these types of situations, conflicts would generally be handled on a case-by-case basis. Regulations preclude the waste of any public resource, and in most situations compromises would be reached that affirm the ability of mineral developers to produce the mineral resources. A time delay on the part of one developer often provides a workable solution.

OHV management would potentially affect some salable mineral development activities by limiting times or places where vehicles could travel.

Paleontological resource management impacts on salable mineral development would be minimal. If important scientific fossils were discovered as the result of inventories conducted in association with surface disturbing activities, the resource would be managed according to BLM procedures. Avoidance of important paleontological resources would possibly delay or postpone salable mineral development activities while paleontological resources were collected and removed. Relocation of proposed access roads and other ancillary facilities would potentially cause delays in developing salable mineral resources.

Developed and undeveloped recreation sites could limit salable mineral development in some areas. Recreation sites would be closed to salable mineral disposal, which would reduce the land available for development of salable minerals.

The establishment of SD/MAs would have an impact on salable mineral activities because of the imposition of limits on activities in areas containing sensitive resource values. The extent of these limits varies according to the basis for establishing each SD/MA and the associated mitigation measures. Because mineral material disposal is a discretionary activity, where sensitive resource values and salable mineral materials overlap, the salable mineral development would be precluded.

Transportation and access management actions for maintenance of the public land transportation system would provide for public safety and adequate access for mineral development tasks. Industry would, in most cases, use the existing state, county, or BLM transportation network for initial access to potential mineral exploration and development sites, access for geophysical exploration, etc. Once mineral exploration and development activities were approved by BLM, industry would be required to improve and maintain existing BLM roads or develop new roads and routes to meet development and operational needs.

Vegetation management would require reclamation and weed control mitigation measures for surface disturbing activities to revegetate disturbed areas with preexisting native plant species and eliminate weeds (Appendix 36). Habitat containing Special Status Plant Species (Appendix 10) would potentially limit the location of salable mineral exploration and development activities.

VRM would affect the placement of facilities associated with minerals exploration and development activities on the public lands and could exert a definite influence on finding acceptable locations where development might occur as well as the size and coloration of facilities depending on the visual class and location.

Water quality, watershed, and soils management actions such as avoiding areas within specified distances of ephemeral streams, live water (springs, rivers, and creeks), etc., and unstable areas such as landslides, slumps, and steep slopes would restrict but not preclude the ability to explore for and develop salable minerals. Avoiding water resources in these areas would mean modifying extraction methods, changing the location, or precluding some projects. The application of various BMPs or other mitigation measures would be attached to the project approval (Appendices 1, 13, and 15).

Wild horse management (horse roundups) would potentially delay salable mineral development activities for a few days per location. Location of permanent wild horse trap sites would preclude salable mineral activities.

Management of wildlife resources would result in modification of locations and minimization of construction disturbance to maintain connectivity between large contiguous blocks of habitat, protect sensitive wildlife habitat, and reduce repeated human presence in crucial raptor habitats and migration corridors. Mitigation would delay or postpone salable mineral development activities by not allowing surface occupancy, controlling surface use, or placing timing restrictions on project proposals. In some situations, mineral material disposal would be precluded and a new mineral material site would need to be established at another location. Avoidance of important or sensitive habitats (rock outcrops, aspen stands, lek sites and other potential breeding and nesting substrates) would influence access routes and facility placement in Critical habitat areas. Wildlife habitat and forage requirements would influence the development of appropriate seed mixes and add additional time and effort to reclamation activities.

4.8.2 Impacts Under Alternative 1: Continuation of Existing Management

The effects of air management, fire and fuels management, forest management, livestock management, minerals management, OHV management, national natural landmarks management, WSR management, transportation and access management, vegetation management, and wild horse management are discussed in the Impacts Common to All Alternatives section for all mineral resources.

Leaseable Minerals—Oil and Gas

To protect cultural resources, an area within 1/4 mile of an NRHP property or the visual horizon, whichever is closer, would be an avoidance area for surface disturbing and disruptive activities, if the setting contributes to NRHP eligibility. If small NRHP-eligible cultural resource sites are present, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts to cultural resources. These avoidance measures would require establishment of facilities in adjacent areas, which would delay and possibly limit oil and gas activities in these areas. Also, within sensitive areas (e.g., Chain Lakes and dunal areas in general) all surface disturbing activities would be subject to cultural monitoring on a case-by-case basis. This could delay oil and gas exploration and development activities in these areas.

Lands and realty management actions include areas within 1/4 mile of incorporated boundaries of all cities/towns (1,500 acres) open to oil and gas leasing with intensive management and would delay proposed projects. Land disposal actions (63,460 acres) could reduce the area available for future oil and gas leasing and development activities. For projects proposed in avoidance areas (Map 2-30), intensive management of surface disturbing and disruptive activities would be applied to existing leases and would potentially change the location and/or design of some projects.

OHV use for “necessary tasks,” such as geophysical exploration including project survey and layout, would allow for the orderly and efficient completion of oil- and gas-related tasks.

Paleontological resources management for Class 4 and 5 geologic formation exposures where paleontological resources could be found would be subject to on-the-ground surveys prior to approval of surface disturbing activities. This would delay oil and gas activities within these areas.

Developed and undeveloped recreation sites (9,660 acres) would be open to oil and gas leasing with an NSO stipulation, making the use of directional drilling mandatory and restricting placement of facilities in these areas. Surface disturbance would be intensively managed in the 1/4-mile buffer surrounding these sites (an additional 7,930 acres; Map 3-7), which would potentially delay development activities.

Only the Adobe Town WSA (32,650 acres), which is closed to leasing, is situated in an area considered to have at least moderate potential for the presence of oil and gas resources (Map 4-7). WSAs totaling 64,150 acres are closed to federal mineral leasing (Map 2-6), thereby precluding new oil and gas leasing and development activities in these areas. Approximately 27,050 acres of the WSAs have a moderate hydrocarbon potential (Table 2-6).

The Shirley Mountain SRMA (24,440 acres) and North Platte River SRMA (5,060 acres, including a 1/4-mile buffer on either side of the river) would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. This management action would limit placement of some facilities and potentially delay activities associated with oil and gas exploration and development in order to avoid sensitive resources (Map 2-14).

SD/MA management actions protect the integrity of unique resource values and provide the opportunity for other uses where appropriate. All WSAs are closed to future leasing, which would preclude future oil and gas activities in these areas. The impact of SD/MAs (Maps 2-7, 2-10, and 2-14) on oil and gas exploration and development would depend on the type and extent of the resources requiring special designations as well as on hydrocarbon potential in these areas (Table 2-6). Restrictions or stipulations necessary to manage SD/MAs would potentially lead to a reduction in the time available to drill and complete oil and gas wells and construct ancillary facilities; restrictions would also result in the relocation of proposed well pads, access roads, pipelines, and ancillary facilities.

The Como Bluff ACEC/NNL (1,690 acres), which is open to oil and gas leasing with intensive management of surface disturbance within 1/4 mile of Morrison Formation surface exposures, would directly influence the placement of oil and gas facilities (Map 2-7) within the area.

The Sand Hills ACEC (7,960 acres), Jep Canyon ACEC (13,810 acres), Shamrock Hills ACEC (18,400 acres), Chain Lakes Potential ACEC (30,560 acres), Cave Creek Cave ACEC (240 acres), Laramie Peak Potential ACEC (18,940 acres), Red Rim-Daley Potential ACEC (11,100 acres), Pennock Mountain WHMA (7,770 acres), Wick-Beumee WHMA (280 acres), Laramie Plains Lakes Potential ACEC (1,600 acres), and Upper Muddy Creek Watershed/Grizzly Potential ACEC (26,850 acres) would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. This management action would limit placement of some facilities and potentially delay activities associated with oil and gas exploration and development to avoid sensitive resources (Maps 2-7 and 2-10).

To protect historic trails, an area within 1/4 mile of the trail or the visual horizon, whichever is closer, would be an avoidance area for surface disturbing and disruptive activities, if the setting contributes to NRHP eligibility. If historic trails are present, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts to cultural resources. These avoidance measures would require establishment of facilities in adjacent areas, which would delay and possibly limit oil and gas activities in these areas.

The Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres) and the Continental Divide National Scenic Trail SRMA (600 acres) would be open to oil and gas leasing with an NSO stipulation. This would mandate the use of directional drilling and preclude the placement of oil and gas facilities in these areas.

VRM Class II area requirements (359,610 acres; Table 2-9 and Appendix 25), which preserve the existing character of the landscape, would potentially change the location or design of oil and gas facilities, and in rare cases preclude development activities.

Water quality, watershed, and soils management actions would be the same as the impacts described in common to all, except that surface discharge of produced water from oil and gas development would be allowed provided it meets state standards for water quality in the Colorado River Basin, North Platte River Basin, and Great Divide Basin. These actions would increase the flexibility of oil and gas development projects by allowing for surface discharge as a disposal method for produced waters, subject to limits posed by state and federal regulatory requirements for water quality.

To protect wildlife resources, surface disturbing and disruptive activities would be prohibited: (1) within 3/4 to 1 mile of raptors, depending on species (Table 2-1, Wildlife and Fisheries section), from February 1 to July 31; (2) in big game crucial winter range during the period November 15 to April 30; (3) in parturition areas (Maps 2-55 and 2-56) from May 1 to June 30; (4) in winter concentration areas for greater sage-grouse and sharp-tailed grouse during the period November 15 to April 30; and (5) where they potentially affect nesting and breeding within a 2-mile radius of the perimeter of a greater sage-grouse lek and within a 1-mile radius of the perimeter of a sharp-tailed grouse lek from March 1 to July 15. In the area east of State Highway 789, south of Interstate 80 (I-80), west of State Highway 71 and Carbon County Road 401, and north of State Highway 70, surface disturbing and disruptive activities potentially affecting nesting and breeding of greater sage-grouse or sharp-tailed grouse would be prohibited within a 2-mile radius of the perimeter of a greater sage-grouse lek and within a 1-mile radius of the perimeter of a sharp-tailed grouse lek from March 1 to July 15. Prohibiting surface disturbance would preclude oil and gas exploration (including geophysical) and development activities during these times and within the areas specified. Overlapping restrictions with respect to both time and areal extent could cause even greater delays to oil and gas activities. Seasonal restrictions would potentially limit the

time available to complete activities. For deep wells that may take 6 or more months to drill, complete, and install production facilities, phased operations would be necessary. Normal depth wells may require drilling and completion operations to be interrupted, and these activities would need to be completed in phases to accommodate the seasonal restrictions.

Locatable Minerals

To protect cultural resources, an area within 1/4 mile of an NRHP property or the visual horizon, whichever is closer, would be an avoidance area for surface disturbing and disruptive activities, if the setting contributes to NRHP eligibility. If small NRHP-eligible cultural resource sites are present, access roads, drill sites, and other ancillary facilities would be relocated to avoid adverse impacts.

Lands and realty management actions include an additional 63,670 acres of public land that would be withdrawn from locatable mineral entry and would preclude development in these areas. Land disposal actions (63,460 acres) could reduce the area available for future locatable mineral exploration and development activities. Conflicts involving placement of locatable mineral facilities and transportation ROWs (pipelines, power lines, etc.) could be resolved by relocating infrastructure as deemed necessary.

OHV use for “necessary tasks,” such as geophysical exploration including project survey and layout, would allow for the orderly and efficient completion of locatable exploration.

Closure of developed recreation sites (5,560 acres) to locatable mineral entry would prohibit future locatable mineral development activities in these areas (Map 3-7). Surface disturbance would be intensively managed in the 1/4-mile buffer surrounding these sites (an additional 7,930 acres; Map 3-7), which could restrict the placement of facilities in these areas.

Interim management of lands under Wilderness Review precludes locatable mineral exploration and development activities in the Ferris Mountains, Adobe Town, Prospect Mountain, Bennett Mountains, and Encampment River Canyon WSAs (66,120 acres).

Any locatable mineral project proposals in SD/MAs designated as ACECs, etc. (Table 2-1), would require the submittal and BLM approval of a 43 CFR 3809 Plan of Operations as described in the Assumptions for Analysis above. Public lands within 1/4 mile of historic trails would be open to locatable mineral entry but would require placement of facilities away from historic trails.

VRM Class II area requirements (359,610 acres; Table 2-9 and Appendix 25), which preserve the existing character of the landscape, would potentially change the location or design of locatable mineral development, and in rare cases preclude development activities.

Water quality, watershed, and soils management actions would result in the same impacts as those described under the Impacts Common to All Alternatives section.

Wildlife restrictions (Table 2-1, Wildlife and Fisheries section) would potentially delay locatable mineral exploration and development projects that propose more than 5 acres of surface disturbance. Impacts to locatable minerals activities would be minimal because no major development is expected to occur during the life of the current RMP.

Salable Minerals

This alternative describes the current situation with respect to mitigation applied to salable mineral activities on the public lands. Use authorizations for salable minerals are discretionary actions, and BLM is not legally obligated to authorize any particular mineral material disposal from the public lands.

To protect cultural resources, an area within 1/4 mile of a NRHP property or the visual horizon, whichever is closer, would be an avoidance area for surface disturbing and disruptive activities, if the setting contributes to NRHP eligibility. If small NRHP-eligible cultural resource sites are present, access roads, and other ancillary facilities would be routed around these sites to avoid adverse impacts. If adequate mitigation could not be achieved, the material site would not be approved and an alternate site would need to be found.

Lands and realty management actions would include areas within 1/4 mile of incorporated boundaries of all cities/towns (1,500 acres) and would be open to salable mineral disposals with intensive management to reduce impacts. Any land disposal of isolated public parcels (61,010 acres) would reduce the area available for future salable mineral exploration and development activities on public land; alternate sources might be available on private land. ROWs or disposal sites would be relocated if salable mineral development conflicts with other resource values.

Development of oil and gas would have immediate and localized impact on the development of salable minerals based on the need to provide construction materials for roads and infrastructure. Development of the oil and gas resource would typically drive the demand for salable mineral resources and therefore could result in an increase or decrease in the number of salable mineral disposal actions. Material sites would be located close to but not in conflict with oil and gas development infrastructure.

OHV use for “necessary tasks,” such as geophysical exploration including project survey and layout, would allow for the orderly and efficient completion of salable minerals tasks.

Developed recreation sites (5,560 acres) closed to salable mineral disposals would be intensively managed in the 1/4-mile buffer surrounding these sites (an additional 7,930 acres; Map 3-7) and would potentially preclude salable mineral activities in the subject areas. Mineral material development activities that create dust, noise, and visual intrusions would be constrained or precluded to retain recreation values at adjacent recreation sites.

The Ferris Mountains, Adobe Town, Prospect Mountain, Bennett Mountains, and Encampment River Canyon WSAs are subject to the Interim Management Policy for Lands under Wilderness Review. Current policy precludes any salable mineral exploration and development activities in these areas, which total 66,120 acres (Map 2-6).

SD/MAs (Table 2-1) would influence salable mineral disposal in terms of the size, location, and period of operation to protect sensitive resources in the area and would potentially preclude salable mineral development activities in some situations. Public lands within 1/4 mile of historic trails would be open to salable mineral development but would require placement of facilities away from the trails.

The Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres) would be unavailable for salable mineral disposals, thereby precluding development activities in this area.

VRM Class II area requirements (359,610 acres; Table 2-9 and Appendix 25), which preserve the existing character of the landscape, would potentially change the location or design of salable mineral development, and in rare cases preclude development activities.

Impacts from water quality, watershed, and soils management actions would be the same as the impacts described in Impacts Common to All Alternatives, except that surface discharge of produced water from gravel and sand pit dewatering would be allowed provided it meets state standards for water quality in the Colorado River Basin, North Platte River Basin, and Great Divide Basin. These actions would increase the flexibility of gravel or sand pit dewatering by allowing for surface discharge as a disposal method for produced waters, subject to limits posed by state and federal regulatory requirements for water quality.

Wildlife restrictions outlined in previous sections would apply to proposed mineral material sites (Table 2-1, Wildlife and Fisheries section). Where distance and seasonal restrictions severely limit the time and areas available to conduct salable mineral activities, the projects could be precluded. Exceptions to some restrictions might in some cases allow some development to occur (Appendix 9). If restricted areas are small enough, alternate sites could possibly be found in some areas.

Summary

Leaseable Minerals

Many management actions result in a reduction of expected oil and gas exploration and development activities. This in turn influences the number of wells and the petroleum production expected from the public lands in the RMPPA. Implementation of restrictions, such as distance and timing restrictions and closures to surface disturbing activities, would cause a decrease in oil and gas development activities. Closing 66,120 acres to oil and gas leasing (Map 2-35) would preclude new oil and gas leasing and development in these areas while use of NSO requirements (185,130 acres) would make the use of directional drilling mandatory.

Approximately 8,945 oil and gas wells would be drilled during the life of the plan; of these, 5,111 would access private minerals. Approximately 3,834 federal wells would disturb 26,500 acres out of a total estimated disturbance of 62,000 acres for all wells drilled in the RMPPA. The Rawlins RFD scenario determined the percentage reduction in projected oil and gas production for Alternative 1 and established a baseline for assessing the impacts associated with existing restrictions. From baseline (no restrictions) conditions, (1) oil production would decrease by 24.7 percent; (2) conventional gas production would decrease by 9 percent; (3) coalbed gas production would decrease by 13.6 percent; and (4) total gas production would decrease by 11.5 percent.

Locatable Minerals

Withdrawals to locatable mineral entry currently total 935,530 acres. An additional 63,670 acres would be withdrawn from locatable mineral entry (Table 2-2 and Map 2-4). This would limit the amount of lands available for future locatable mineral exploration and development activities on the public lands.

Salable Minerals

Because the disposal of salable minerals, under current legal mandates, is discretionary on the part of the BLM Authorized Officer, any protection measures deemed necessary for the protection of various resource values would be implemented as required. Proposals to initiate exploration and development projects can be allowed or denied as desired. Any resource in conflict with the development of a salable mineral site can provide the basis for applying necessary mitigation measures or denying a request for authorization to establish such a site. Each specific proposal must be evaluated on a case-by-case basis. In some situations, an alternative site can be found; however, this is not always possible. In some areas, suitable replacement deposits may not be available because the deposits are located outside of reasonable

haul distances. As a result of the long haul distances required from the source area to the use area, utilization is too expensive.

Proposed management actions would close 11,090 acres to salable mineral disposals. This would limit the amount of lands available for salable mineral exploration and development activities on the public lands.

4.8.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The effects of air management; cultural management; fire and fuels management; forest management; livestock management; minerals management; OHV management; recreation management; national natural landmarks management; WSR management; transportation and access management; vegetation management; water quality, watershed, and soils management; and wild horse management are the same as the impacts described under Alternative 1 for all mineral resources.

Leaseable Minerals—Oil and Gas

Lands and realty management impacts would be essentially the same as those described in Alternative 1. Land disposals would be considered on a reduced amount of acreage (46,230 acres), and restrictions on placement of new facilities, including linear ROWs, in areas identified in Table 2-5 would affect fewer areas in Alternative 2.

Paleontological resource management for Class 4 and 5 geologic formation exposures where paleontological resources could be found would be subject to on-the-ground surveys prior to approval of surface disturbing activities. This could delay oil and gas activities within these areas while required surveys are being conducted.

The North Platte River SRMA would be managed using standard mitigation measures instead of being intensively managed as in Alternative 1. This would enhance the ability to conduct oil and gas projects in this area.

Impacts from SD/MA management actions discussed in Alternative 1 are also applicable to Alternative 2, with one exception. The Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres) would be open to leasing subject to an approved management plan. The plan must address concerns about ongoing research projects in this area and avoid impacting these projects. Approval, if granted, would require the implementation of BMPs and other mitigation measures to reduce impacts to the research area. This would potentially delay oil and gas activities planned for the area. Also, leasing is still allowed in the Upper Muddy Creek Watershed/Grizzly Potential ACEC, but the acreage has expanded from 26,850 acres to 59,720 acres, which would cause delays to oil and gas project proposals over a larger area. Wildlife restrictions in SD/MAs would be greatly reduced, resulting in more flexibility in terms of timing and location where mineral activities would occur as compared with Alternative 1.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be less (232,830 acres; Table 2-9 and Appendix 25).

Wildlife restrictions would be greatly reduced, resulting in more flexibility in terms of timing and location where oil and gas activities would occur as compared with Alternative 1. Wildlife management of oil and gas activities involving surface disturbance would be subject to delays resulting from the prohibition of activities within 1/2 mile of raptors (Table 2-1, Wildlife and Fisheries section) for various periods, depending on species, from February 1 to September 15. Surface disturbing and disruptive activities located within 1/4 mile of a greater sage-grouse or sharp-tailed grouse lek would be prohibited.

Locatable Minerals

Impacts from lands and realty management would be similar to those described in Alternative 1, except that land disposals would be considered on a reduced amount of acreage (46,230 acres), and restricting placement of new facilities, including linear ROWs, in areas identified in Table 2-5 would affect fewer areas in Alternative 2.

Potential paleontological discovery areas would be subject to on-the-ground surveys prior to approval of surface disturbing activities for Class 4 and 5 geologic formations on a case-by-case basis. This would delay locatable mineral activities for projects proposing more than 5 acres of disturbance until surveys could be conducted on the public lands.

Impacts from SD/MA management actions (Table 2-1) discussed in Alternative 1 are also applicable to Alternative 2, with one exception. The Cave Creek Cave Potential ACEC (240 acres) would be closed to locatable mineral entry, which would preclude future locatable mineral exploration and development activities in this area. Shamrock Hills would not require a 43 CFR 3809 Plan of Operation for projects of fewer than 5 acres in size. Wildlife restrictions in SD/MAs would be greatly reduced, resulting in more flexibility in terms of timing and location where mineral activities would occur as compared with Alternative 1.

VRM actions would be the same as those described in Alternative 1, except that the acreage would be less (232,830 acres; Table 2-9 and Appendix 25).

Locatable mineral activities involving more than 5 acres of surface disturbance would be subject to delays resulting from the prohibition of activities within 1/2 mile of raptors (Table 2-1, Wildlife and Fisheries section) for various periods, depending on species, from February 1 to September 15. Surface disturbing and disruptive activities located within 1/4 mile of a greater sage-grouse or sharp-tailed grouse lek would be prohibited. Wildlife restrictions would be greatly reduced, resulting in more flexibility in terms of timing and location where locatable mineral activities would occur as compared with Alternative 1.

Salable Minerals

Impacts from lands and realty management would be essentially the same as those described in Alternative 1, except that land disposals would be considered on a reduced amount of acreage (46,230 acres), and restricting placement of new facilities, including linear ROWs, in areas identified in Table 2-5 would affect fewer areas in Alternative 2.

Paleontological resource management for Class 4 and 5 geologic formation exposures where paleontological resources could be found would be subject to on-the-ground surveys prior to approval of surface disturbing activities. Discovery of paleontological resources would likely preclude the establishment of any material sites in these areas.

The North Platte River SRMA would be managed using standard mitigation measures instead of being intensively managed as in Alternative 1. This would allow salable mineral activities in areas where they previously would have been precluded.

Impacts from SD/MA management actions discussed in Alternative 1 are also applicable to Alternative 2 with one exception. The Cave Creek Cave Potential ACEC (240 acres) would be unavailable for salable mineral activities. This would preclude salable mineral exploration and development activities in these areas. Wildlife restrictions in SD/MAs would be greatly reduced, resulting in more flexibility in terms of timing and location where mineral activities would occur as compared with Alternative 1.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be less (232,830 acres; Table 2-9 and Appendix 25).

Salable mineral activities involving surface disturbance would be subject to delays resulting from the prohibition of activities within 1/2 mile of raptors (Table 2-1, Wildlife and Fisheries section) for various periods, depending on species, from February 1 to September 15. Surface disturbing and disruptive activities located within 1/4 mile of a greater sage-grouse or sharp-tailed grouse lek would be prohibited. Wildlife restrictions would be greatly reduced, resulting in more flexibility in terms of timing and location where salable mineral activities would occur as compared with Alternative 1.

Summary

Leaseable Minerals

Management actions under Alternative 2 are less restrictive as compared with other alternatives. Approximately 66,120 acres closed to new oil and gas leasing would preclude future oil and gas exploration and development activities in these areas, and NSO requirements (92,180 acres) would make the use of directional drilling mandatory. Fewer restrictions on surface disturbing and other disruptive activities would allow more time for exploration and development to occur.

Approximately 9,198 wells, or 3 percent more wells than in Alternative 1, would be developed during the planning period; of these, 5,111 would access private minerals. Approximately 4,087 federal wells would disturb 28,300 acres out of a total estimated disturbance of 64,000 acres for all wells drilled in the RMPPA. A small increase in the amount of oil and gas produced would occur as compared with Alternative 1. The Rawlins RFD scenario determined that from baseline (no restrictions) conditions, (1) oil production would decrease by 15.1 percent; (2) conventional gas production would remain stable (no change); (3) coalbed gas production would decrease by 11.2 percent; and (4) total gas production would decrease by 6 percent.

Locatable Minerals

Impacts to locatable mineral exploration and development would be similar to impacts described in Alternative 1, but there would be fewer restrictions on surface disturbing and other disruptive activities that would allow more time for exploration and development to occur. An additional 6,400 acres would be withdrawn from mineral entry (Table 2-2 and Map 2-39). This would preclude future locatable mineral exploration and development activities on these public lands.

Salable Minerals

Impacts to salable mineral exploration and development would be similar to impacts described in Alternative 1, but the reduced number of restrictions on surface disturbance in Alternative 2 would allow more opportunities for salable mineral activities to occur. Approximately 12,230 acres would be off-limits to salable mineral disposals.

4.8.4 Impacts under Alternative 3: Emphasis on Protection of Resources

The effects of air management, fire and fuels management, forest management, livestock management, minerals management, OHV management, recreation management, national natural landmarks management, WSR management, transportation and access management, and wild horse management are the same as the impacts described under Alternative 1 for all mineral resources.

Leaseable Minerals—Oil and Gas

To protect cultural resources, surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. This would preclude oil and gas exploration and development if directional drilling was not feasible in these areas. Also, within sensitive areas (e.g., Chain Lakes area and dunal areas in general), all surface disturbing activities would be subject to cultural monitoring for all project proposals, thereby potentially delaying oil and gas exploration and development activities.

Lands and realty management actions for areas within 1/2 mile of incorporated boundaries of all cities/towns (4,500 acres) would be open to oil and gas leasing with an NSO stipulation making use of directional drilling and offsite facilities mandatory for oil and gas activities in these areas. Existing leases would be intensively managed, resulting in delays to project proposals. No land disposal actions would be considered, so no reduction in the area available for the future leasing of oil and gas would occur. Road densities would not be allowed to exceed levels that diminish or adversely affect other resources or resource values, which could delay and possibly preclude development in some areas (Table 2-5 and Map 2-32).

Potential paleontological resource areas would be subject to on-the-ground surveys and possibly site monitoring on a case-by-case basis prior to approval of surface disturbing activities where Class 4 and 5 geologic formations are exposed. This management action would potentially delay oil and gas activities on the public lands.

Developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/2-mile area (an additional 12,750 acres) would be open to oil and gas leasing with an NSO stipulation that would mandate the use of directional drilling and possibly preclude development in some portions of these areas by restricting the placement of facilities.

The Shirley Mountain SRMA (37,820 acres), North Platte River SRMA (12,740 acres, including a 1/4-mile buffer on either side of the river), Jelm Mountain SRMA (18,100 acres), Pedro Mountain SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be open to oil and gas leasing with an NSO stipulation making the use of directional drilling mandatory and precluding the placement of oil and gas facilities in these areas. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, potentially changing the location and/or design of some projects. OHV use would be limited to designated roads and vehicle routes, thereby delaying and possibly precluding geophysical exploration on these lands (Map 2-16).

All WSAs are closed to future oil and gas leasing and associated activities. The Adobe Town WSA (32,650 acres) would be accessible for extant lease development subject to specific mitigation measures. The other WSAs totaling 33,470 acres would be closed to all types of motorized vehicle use (Map 2-6) and would preclude oil and gas exploration and development activities in these areas.

The Como Bluff ACEC (1,690 acres) would be open to oil and gas leasing with an NSO stipulation on any new leases. This would make directional drilling mandatory and preclude the placement of oil and gas facilities in this area. Surface disturbing activities on existing leases would be subject to delays associated with intensive management.

The Sand Hills ACEC and Potential JO Ranch Expansion (12,680 acres), Jep Canyon WHMA (13,810 acres), Chain Lakes Potential ACEC (30,560 acres), Pennock Mountain WHMA (7,770 acres), Wick-Beumee WHMA (280 acres), Cave Creek Cave Potential ACEC (520 acres), Laramie Plains Lakes Potential ACEC (1,600 acres), Blowout Penstemon Potential ACEC (17,050 acres), Upper Muddy Creek

Watershed/Grizzly Potential ACEC (59,720 acres), and Cow Butte/Wild Cow Potential WHMA (49,570 acres) would be closed to new oil and gas leasing, thereby precluding development in these areas where the SD/MA is currently not leased. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, potentially changing the location and/or design of some projects (Map 2-8 and Map 2-12).

The Laramie Peak Potential ACEC (18,940 acres), Shamrock Hills RCA (18,400 acres), and Red Rim-Daley Potential ACEC (11,100 acres) would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. This action would result in delays to oil and gas exploration and development activities in these areas.

The Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres), Historic Trails Potential ACEC (66,370 acres), High Savery Dam Potential ACEC (530 acres), and Continental Divide National Scenic Trail (600 acres) would be open to oil and gas leasing with an NSO stipulation making the use of directional drilling mandatory and precluding the placement of oil and gas facilities in these areas. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, potentially changing the location and/or design of some projects. OHV use would be limited to designated roads and vehicle routes, thereby delaying and possibly precluding geophysical exploration on these lands.

Prohibiting surface disturbing or disruptive activities within 50 meters (164 feet) of a prairie dog town inside the White-Tailed Prairie Dog Potential ACEC (109,650 acres) would make the use of directional drilling mandatory and would potentially preclude the placement of oil and gas facilities in these areas.

Vegetation management actions would be similar to those described in Alternative 1, with the addition of management actions to meet DPC objectives for reclamation in rangelands. These objectives would require changes in seed mixtures and/or planting methods to promote desired plant species (Appendix 36). Occupied habitat for threatened, endangered, proposed, and candidate species would be open to oil and gas leasing with an NSO stipulation, which would require the use of directional drilling to access mineral resources from adjacent areas that might be amenable to these activities (Appendix 24). Occupied habitat for the blowout penstemon would not allow OHV use for “necessary tasks” including geophysical exploration, which would reduce the operational flexibility for these types of activities.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be more (351,050 acres, See Table 2-9 and Appendix 25).

Water quality, watershed, and soils management actions place restrictions on the placement of facilities, the location and design of roads, and well pads impacts. Impacts from these types of restrictions are similar to those described in Alternative 1. Surface discharge of produced water would not be allowed in the Colorado River Basin and would be limited in the North Platte River Basin and the Great Divide Basin. These management actions would potentially complicate oil and gas development projects that require the disposal of produced water. In some cases, the economics would make marginal projects infeasible; if this were to occur, the federal mineral resources might not be fully developed. However, most projects would still be economically feasible with the injection of produced waters.

New permanent roads or structures would not be allowed in the Encampment River watershed, and surface disturbing activities would be intensively managed to meet watershed objectives. This would preclude any oil and gas activity on public lands that might be proposed in this area (Map 2-19), which generally has low potential for oil and gas development.

To protect wildlife resources, surface disturbing and disruptive activities would be prohibited: (1) within 1.5 miles of raptors for various periods, depending on species (Table 2-1, Wildlife and Fisheries section), from February 1 to September 15; (2) in big game parturition areas (Maps 2-55 and 2-56); (3) within 50 meters (164 feet) of the prairie dog towns; (4) in winter concentration areas for greater sage-grouse and sharp-tailed grouse during the period November 15 to March 14; and (5) within 1/4 mile of the perimeter of a greater sage-grouse or sharp-tailed grouse lek (with an additional 1/4-mile buffer around all leks being applied to all human activity from 6:00 p.m. until 9:00 a.m. daily from March 1 to May 20) and within a 2-mile radius of the perimeter of a greater sage-grouse lek and a 1-mile radius of the perimeter of a sharp-tailed grouse lek from March 1 to July 15. In the area east of State Highway 789, south of I-80, west of State Highway 71 and Carbon County Road 401, and north of State Highway 70, surface disturbing and disruptive activities, including geophysical surveys, would be prohibited that potentially affect the breeding and nesting of greater sage-grouse and sharp-tailed grouse within a 4-mile radius of the perimeter of a sage grouse lek and within a 2-mile radius of the perimeter of a sharp-tailed grouse lek from March 1 to July 15. Prohibiting and avoiding surface disturbance would delay oil and gas exploration (including geophysical surveys) and development activities at the times and places specified. Oil and gas activities would be strongly discouraged in avoidance areas and any authorizations made would have to be compatible with the purpose for which the area was designated. Overlapping restrictions with respect to both time and areal extent would potentially cause even greater delays to oil and gas activities. For deep wells that may take 6 or more months to drill, complete, and install production facilities for, phased operations would be necessary. Normal depth wells may require drilling and completion operations to be interrupted, and these activities would need to be completed in phases to accommodate the seasonal restrictions.

RCAs (620 acres), except for the Shamrock Hills RCA, would be closed to future oil and gas leasing, and surface disturbance and disruptive activities proposed in RCAs on existing leases would be intensively managed. Closing these areas to leasing would preclude future oil and gas activities and intensive management of surface disturbing and disruptive activities would be applied to existing leases would potentially change the location and/or design of some projects. Well locations, roads, ancillary facilities, and other surface structures requiring repeated human presence would not be allowed within 1/4 mile of active raptor nest sites. This action could preclude exploration and development activities within the specified distance of raptor nests.

Locatable Minerals

Areas within 1/2 mile of incorporated boundaries of all cities/towns (4,500 acres) would be withdrawn from locatable mineral entry, thus precluding future locatable mineral activities in these areas. No land disposal actions would be considered, so no reduction in the area available for locatable mineral activities would result from this action. Proposed total withdrawals for this alternative of about 271,110 total acres would be initiated (Table 2-2), thereby reducing the acreage available for future locatable mineral exploration and development.

Potential paleontological resource areas would be subject to on-the-ground surveys, and possibly site monitoring, on a case-by-case basis prior to approval of surface disturbing activities where Class 4 and 5 geologic formations are exposed. This management action would potentially delay locatable mineral projects proposing more than 5 acres of surface disturbance on the public lands.

Developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/2-mile area (an additional 12,750 acres) would be withdrawn from locatable mineral entry. These management actions would preclude locatable mineral exploration and development activities in these areas.

The Shirley Mountain SRMA (37,820 acres), North Platte River SRMA (12,740 acres, including a 1/4-mile buffer on either side of the river), Jelm Mountain SRMA (18,100 acres), Pedro Mountain SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be withdrawn from locatable mineral entry. These management actions would preclude any future locatable mineral exploration and development activities in these areas (Map 2-16).

All WSAs (66,120 acres) would be closed to mineral entry, thus precluding any locatable mineral exploration and development activities in these areas.

The Como Bluff ACEC (1,690 acres), Sand Hills ACEC and Potential JO Ranch Expansion (12,680 acres with expansion), Jep Canyon WHMA (13,810 acres), Shamrock Hills ACEC (18,400 acres), Chain Lakes Potential ACEC (30,560 acres), Laramie Peak Potential ACEC (18,940 acres), Pennock Mountain WHMA (7,770 acres), Wick-Beumee WHMA (280 acres), Red Rim-Daley Potential ACEC (11,100 acres), Cave Creek Cave Potential ACEC (520 acres), Laramie Plains Lakes Potential ACEC (1,600 acres), Historic Trails Potential ACEC (66,370 acres), Blowout Penstemon Potential ACEC (17,050 acres), Upper Muddy Creek Watershed/Grizzly Potential ACEC (59,720 acres), Cow Butte/Wild Cow Potential WHMA (49,570 acres), White-Tailed Prairie Dog Potential ACEC (109,650 acres), High Savery Dam Potential ACEC (530 acres), and Continental Divide National Scenic Trail SRMA (600 acres) would be withdrawn from locatable mineral entry. These management actions would preclude any future locatable mineral exploration and development activities in these areas (Map 2-8 and Map 2-12).

Vegetation management actions would be similar to those described in Alternative 1 with the addition of management actions to meet DPC objectives for reclamation in rangelands. These objectives would require changes in seed mixtures and/or planting methods to promote desired plant species (Appendix 36). Occupied habitat for the blowout penstemon would be closed to locatable mineral exploration and development (Appendix 24), precluding future activities in these areas. Occupied habitat for the blowout penstemon would not allow OHV use for “necessary tasks” including geophysical exploration, which would reduce the operational flexibility for these types of activities.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be more (351,050 acres; Table 2-9 and Appendix 25).

Water quality, watershed, and soils management actions would have the same impacts to locatable minerals as those described in Alternative 1.

Seasonal and other types of wildlife management restrictions, described in the previous section, would apply only to locatable mineral projects that propose more than 5 acres of surface disturbance. Projects that involve fewer than 5 acres of disturbance would be subject to legal mandates described at the beginning of this section. Impacts to locatable minerals exploration and development activities would be minimal because no major projects are expected during the life of the current RMP.

Salable Minerals

Surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. This would preclude salable mineral exploration and development in these areas. Also, within sensitive areas (e.g., Chain Lakes area and dunal areas in general), all salable mineral activities, if allowed, would be subject to delays associated with cultural monitoring for all project proposals. In most cases, alternative sites would need to be established.

Lands and realty management actions for areas within 1/2 mile of incorporated boundaries of all cities/towns (4,500 acres) would be unavailable for salable mineral activities. No land disposal actions would be considered; therefore, no reduction in the area potentially available for salable mineral activities would result from this action. Road densities would not be allowed to exceed levels that diminish or adversely affect other resources or resource values, which would limit and possibly preclude development in some areas. Areas proposed for withdrawals (271,110 acres; Table 2-2) would be unavailable for salable mineral exploration and development.

Potential paleontological resource areas would be subject to on-the-ground surveys, and possibly site monitoring, on a case-by-case basis prior to approval of surface disturbing activities where Class 4 and 5 geologic formations are exposed. These management requirements would delay salable mineral activities in areas where they apply.

Developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/2-mile area (an additional 12,750 acres) would be unavailable for salable mineral development activities. Mineral disposal activities that create dust, noise, and visual intrusions would be constrained or precluded in order to retain recreation values at the adjacent recreation sites.

All WSAs (66,120 acres) would be closed to salable exploration and development activities.

All of the SD/MAs listed in the previous section, except the Shamrock Hills RCA, would allow salable mineral activity, with special emphasis placed on wildlife management areas. This would delay the establishment of material disposal sites in areas where they are not precluded. Salable mineral development is discretionary; therefore, this type of development would be unlikely to occur in most SD/MA areas regardless of specific restrictions. The Stratton Sagebrush Steppe Research Area Potential ACEC and Historic Trails ACEC would be unavailable for salable mineral disposals, precluding salable activities in this area.

Vegetation management actions would be similar to those described in Alternative 1 with the addition of management actions to meet DPC objectives for reclamation in rangelands. These objectives would require changes in seed mixtures and/or planting methods to promote desired plant species (Appendix 36). Occupied habitat for the blowout penstemon would be closed to salable mineral exploration and development (Appendix 24), precluding future activities in these areas.

VRM actions would be the same as those described in Alternative 1, except that the acreage would be more (351,050 acres; Table 2-9 and Appendix 25).

Water quality, watershed, and soils management actions would not allow surface discharge of produced waters in the Colorado River Basin and would limit surface discharge of produced waters in the North Platte River Basin and the Great Divide Basin. These management actions would complicate salable mineral development projects that require the disposal of produced water.

New permanent roads or structures would not be allowed in the Encampment River watershed. This would preclude salable mineral activity in this area (Map 2-19).

Wildlife restrictions would limit the times and locations available to conduct exploration and development activities; in some cases, the projects would be precluded and alternate sites would need to be established.

Summary

Leaseable Minerals

Management actions under this alternative would be the most restrictive to oil and gas exploration and development activities as compared with Alternatives 1, 2, and 4. Approximately 86,210 acres would be closed to new oil and gas leasing and thereby preclude new oil and gas activities, while approximately 281,560 acres would be leased with an NSO stipulation mandating the use of directional drilling technology. Implementation of restrictions, such as the imposition of timing and distance limits as well as closures to surface disturbing activities, would cause a decrease in oil and gas activities. The Rawlins RFD scenario determined the percent reduction in projected oil and gas production for Alternative 3. From baseline (no restrictions) conditions, (1) oil production would decrease by 45.3 percent; (2) conventional gas production would decrease by 27.2 percent; (3) coalbed gas production would decrease by 16.7 percent; and (4) total gas production would decrease by 21.5 percent.

Approximately 8,632 wells would be developed during the planning; of these, 5,111 would access private minerals. Approximately 3,521 federal wells would disturb 21,000 acres out of a total estimated disturbance of 56,000 acres for all wells drilled in the RMPPA. A decrease in the amount of oil and gas produced would result from implementation of the mitigation described in this alternative.

Locatable Minerals

Approximately 271,110 additional acres would be withdrawn from locatable mineral entry (Table 2-2 and Map 2-40). This would preclude locatable mineral exploration and development activities on these public lands.

Salable Minerals

Because the disposal of salable minerals under current legal mandates is completely discretionary on the part of the BLM Authorized Officer, any protection measures deemed necessary for the protection of various resource values would be implemented as required. Any resource in conflict with the development of a salable mineral site can provide the basis for denying a request for authorization to establish such a site. Each specific proposal must be evaluated on a case-by-case basis. In some situations, an alternative site can be found; however, this is not always possible. In some areas, suitable replacement deposits may not be available because the areas are located many miles away from deposits. As a result of the long haul distances required from the source area to the use area, utilization is too expensive.

Approximately 586,326 acres would be closed to salable mineral exploration and development proposals. This would restrict the areas available for salable mineral exploration and development activities on the public lands.

4.8.5 Impacts Under Alternative 4: Proposed Plan

The effects of air management, fire and fuels management, forest management, livestock management, minerals management, OHV management, recreation management, national natural landmarks management, WSR management, transportation and access management, and wild horse management are the same as the impacts described under Alternative 1 for all mineral resources.

The effects of vegetation management are the same as the impacts described under Alternative 3 for all mineral resources.

Leaseable Minerals—Oil and Gas

To protect cultural resources, surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. This would preclude oil and gas activities if directional drilling is not feasible within these areas. Also, within sensitive areas (e.g., Chain Lakes and dunal areas in general) all surface disturbing activities would be subject to cultural monitoring on a case-by-case basis. This could delay oil and gas exploration and development activities in these areas.

Lands and realty management actions for areas within 1/4 mile of incorporated boundaries of all cities/towns (1,500 acres) would be open to oil and gas leasing with an NSO stipulation. This would make the use of directional drilling mandatory for any new leases in these areas and require that all facilities be placed off-lease. Existing leases would be intensively managed, resulting in delays to proposed activities. About 46,230 acres of BLM-administered isolated parcels that meet FLPMA disposal criteria would be available for sale (Maps 2-26 through 2-29 and Appendix 6). Any land disposals made would reduce the number of acres available for future oil and gas leasing. Areas with important resource values would be avoided where possible in planning for new facility placement; if it becomes necessary for facilities to be placed within an avoidance area, associated impacts would be intensively managed (Table 2-5 and Map 2-33). This would delay and potentially preclude development in some areas.

Potential paleontological resource areas would be subject to on-the-ground surveys on a case-by-case basis prior to approval of surface disturbing activities where Class 4 and 5 geologic formations are exposed at the surface. Monitoring during surface disturbing activities could also be required on a case-by-case basis, and surveys and monitors could be required on a case-by-case basis following a paleontological discovery in Class 3 geological formations. These management requirements would potentially delay oil and gas activities in areas where they would be applicable.

Developed and undeveloped recreation sites (9,660 acres), and the surrounding 1/4-mile area (an additional 7,930 acres) would be open to oil and gas leasing with an NSO stipulation (Map 3-7). Directional drilling from off-lease locations and off-lease placement of facilities would be mandatory in these areas. Smaller areas would be easier to explore than larger ones that might require distances too great to be reached with directional well bores.

The Shirley Mountain SRMA (37,820 acres), North Platte River SRMA (5,060 acres, including a 1/4-mile buffer on either side of the river), Jelm Mountain SRMA (18,100 acres), Pedro Mountain SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be open to oil and gas leasing with an NSO stipulation making directional drilling mandatory and precluding the placement of oil and gas facilities in these areas. With a well bore using directional drilling, smaller, narrower areas would be easier to access than larger areas. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, would potentially change the location and/or design of some projects. OHV use would be limited to designated roads and vehicle routes, potentially preventing geophysical exploration on these lands.

Management actions and associated impacts for WSA areas would be the same as described in Alternative 3 (Map 2-6).

The Como Bluff NNL (1,690 acres) would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities within 1/4 mile of exposures of the Morrison Formation. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, potentially changing the location and/or design of some projects.

The Jep Canyon WHMA (13,810 acres), Shamrock Hills RCA (18,400 acres), Chain Lakes WHMA (30,560 acres), Laramie Peak WHMA (18,940 acres), Red Rim-Daley WHMA (11,100 acres), Pennock Mountain WHMA (7,770 acres), Wick-Beumee WHMA (280 acres), and Cave Creek Cave ACEC (240 acres) would be open to new oil and gas leasing with intensive management of surface disturbing and disruptive activities. These management actions could delay oil and gas exploration and development (Maps 2-9, 2-13, and 2-17) in these areas. OHV travel for "necessary tasks" would not be allowed, thus potentially preventing geophysical exploration of these areas.

The Laramie Plains Lakes SRMA (1,600 acres), Historic Trails area (66,370 acres), High Savery Dam area (530 acres), and Continental Divide National Scenic Trail SRMA (600 acres) would be open to oil and gas leasing with an NSO stipulation making directional drilling mandatory and precluding the placement of oil and gas facilities in these areas. With a well bore using directional drilling, smaller, narrower areas would be easier to access than larger areas. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, potentially changing the location and/or design of some projects. OHV use would be limited to designated roads and vehicle routes, potentially preventing geophysical exploration on these lands.

The Stratton Sagebrush Steppe Research Area (5,530 acres), Blowout Penstemon Potential ACEC (17,050 acres), Sand Hills ACEC and Potential JO Ranch Expansion (12,680 acres), Upper Muddy Creek Watershed/Grizzly WHMA (59,720 acres), and Cow Butte/Wild Cow WHMA (49,570 acres) would be closed to new leasing, thus precluding future exploration and development in these areas where they are not currently leased. Intensive management of surface disturbing and disruptive activities would be applied to existing leases, potentially changing the location and/or design of some projects. Avoidance of surface disturbing or disruptive activities within white-tailed and black-tailed prairie dog towns would also be required. These actions may require the use of directional drilling and potentially would delay and/or relocate the placement of oil and gas facilities in these areas. However, this action would still allow for development.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be more (346,670 acres; Table 2-9 and Appendix 25).

Water quality, watershed, and soils management actions and their associated impacts would be the same as described under Alternative 1, except that water impoundments in the Upper Muddy Creek/Grizzly WHMA (Map 2-13) that would result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. Limits posed by administrative and regulatory requirements could influence the location and intensity of development in areas where specific water management actions are implemented.

New permanent roads or structures would not be allowed in the Encampment River watershed, which generally is considered to have low potential for oil and gas development. Surface disturbing activities would be intensively managed to meet watershed objectives, potentially causing delays to any oil and gas activity in this area (Map 2-19).

To protect wildlife resources, surface disturbing and disruptive activities would be prohibited (1) within 3/4 to 1 mile of raptors for various periods, depending on species (Table 2-1, Wildlife and Fisheries section), from February 1 to September 15; (2) in parturition areas (Maps 2-55 and 2-56) from May 1 to June 30; (3) in winter concentration areas for greater sage-grouse and sharp-tailed grouse during the period November 15 to March 14; and (4) within 1/4 mile of the perimeter of a greater sage-grouse or sharp-tailed grouse lek (with an additional 1/4-mile buffer around all leks being applied to all human activity from 6:00 p.m. until 9:00 a.m. daily from March 1 to May 20) and within a 2-mile radius of the perimeter of a greater sage-grouse lek and within a 1-mile radius of the perimeter of a sharp-tailed grouse

lek from March 1 to July 15. Prohibiting and avoiding surface disturbance would delay oil and gas exploration (including geophysical surveys) and development activities at the times and places specified. Oil and gas activities would be strongly discouraged in avoidance areas and any authorizations made would have to be compatible with the purpose for which the area was designated. Overlapping restrictions with respect to both time and areal extent would potentially cause even greater delays to oil and gas activities. For deep wells that may take 6 or more months to drill, complete, and install production facilities for, phased operations would be necessary. Normal depth wells may require drilling and completion operations to be interrupted, and these activities would need to be completed in phases to accommodate the seasonal restrictions.

Well locations, roads, ancillary facilities, and other surface structures requiring repeated human presence would not be allowed within 825 feet (1,200 feet for ferruginous hawks) of active raptor nest sites. This would preclude oil and gas activities in these areas. Surface disturbance and disruptive activities proposed in RCAs would be intensively managed, causing delays to proposed oil and gas projects.

Locatable Minerals

Surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. These restrictions would preclude locatable mineral activities in these areas. Within sensitive areas (e.g., Chain Lakes area and dunal areas in general), all surface disturbing activities would not be subject to cultural monitoring unless the proposed project area involves more than 5 acres of surface disturbance. Projects of more than 5 acres would be subject to possible delays.

Lands and realty management for areas within 1/4 mile of incorporated boundaries of all cities/towns (1,500 acres) would be withdrawn and closed to locatable mineral entry, thus eliminating these areas from future locatable mineral exploration and development activity. About 46,230 acres of BLM-administered isolated parcels that meet FLPMA disposal criteria would be available for consideration for disposal (Maps 2-26 through 2-29 and Appendix 6), thus potentially reducing the amount of public lands available for locatable mineral activities if land disposals occur. Avoidance of important resource values could limit the areas where locatable mineral activities involving more than 5 acres of surface disturbance could occur (Table 2-5 and Map 2-33).

Potential paleontological resource areas would be subject to on-the-ground surveys, on a case-by-case basis, prior to approval of surface disturbing activities where Class 4 and 5 geologic formations are exposed. Monitoring during surface disturbing activities could also be required on a case-by-case basis, and surveys and monitors could be required on a case-by-case basis following a paleontological discovery in areas where Class 3 geological formations are exposed. These actions could potentially delay the implementation of locatable mineral project proposals of more than 5 acres in these areas.

Lands within 1/4 mile of developed and undeveloped recreation sites (17,590 acres) withdrawn from locatable mineral entry (Map 3-7) would preclude future locatable mineral exploration and development activities in these areas.

The Shirley Mountain SRMA (37,820 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be withdrawn from locatable mineral entry, which would eliminate any future locatable mineral exploration and development activities in these areas.

The five WSAs (66,120 acres) would be closed to locatable mineral exploration and development activities, thereby precluding any locatable mineral operations in these areas.

Any project proposals in the Jep Canyon WHMA (13,810 acres), Shamrock Hills RCA (18,400 acres), Chain Lakes WHMA (30,560 acres), Laramie Peak WHMA (18,940 acres), Blowout Penstemon ACEC (17,050 acres), Pennock Mountain WHMA (7,770 acres), and Wick-Beumee WHMA (280 acres) would require the submittal of a 43 CFR 3809 Plan of Operations for approval, which would potentially delay locatable mineral exploration and development in these areas (Maps 2-9, 2-13, and 2-17).

Red Rim-Daley WHMA (11,100 acres) is open for metalliferous locatable minerals, but it is closed to non- metalliferous locatable mineral entry.

The Cave Creek Cave ACEC (240 acres), Laramie Plains Lakes WHMA (1,600 acres), Sand Hills ACEC and Potential JO Ranch Expansion (12,680 acres with expansion), and High Savery Dam area (530 acres) would be withdrawn from locatable mineral entry, which would eliminate any future locatable mineral exploration and development activities in these areas.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be more (346,670 acres; Table 2-9 and Appendix 25).

Water quality, watershed, and soils management actions and their associated impacts would be the same as described under Alternative 1, except that water impoundments in the Upper Muddy Creek/Grizzly WHMA (Map 2-13) that would result in water depletion to the Colorado River system of greater than 1 acre-foot per year would not be allowed. Limits imposed by administrative and regulatory requirements could influence the location and viability of locatable mineral projects in areas where specific water management restrictions apply.

Seasonal and other types of wildlife management restrictions, described in the previous section, would apply only to locatable mineral projects that propose more than 5 acres of surface disturbance or that involve some legislative mandates. Impacts to locatable minerals exploration and development activities would primarily consist of project delays, but these impacts would be minimal because no major projects are expected to be proposed during the life of the current RMP.

Salable Minerals

To protect cultural resources, surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. This action would preclude salable minerals activities in these areas.

Lands and realty management actions for areas within 1/4 mile of incorporated boundaries of all cities/towns (1,500 acres) would be unavailable for salable mineral disposals. About 46,230 acres of BLM-administered isolated parcels that meet FLPMA disposal criteria would be available for consideration for sale (Maps 2-26 through 2-29 and Appendix 6), thus potentially reducing the amount of public lands available for future salable mineral development. In avoidance areas (Table 2-5 and Map 2-33) where adequate mitigation could not be achieved, the material site would not be approved and an alternative site would need to be found.

Potential paleontological resource areas would be subject to on-the-ground surveys, on a case-by-case basis, prior to approval of surface disturbing activities where Class 4 and 5 geologic formations are exposed. Monitoring during surface disturbing activities could also be required on a case-by-case basis, and surveys and monitors could be required on a case-by-case basis following a paleontological discovery in areas where Class 3 geological formations are exposed. These management requirements could potentially preclude or delay salable mineral activities in areas where they apply.

Lands within 1/4 mile of developed and undeveloped recreation sites (17,590 acres) would be unavailable for salable mineral activities (Map 3-7), thus precluding salable mineral exploration and development activities in these areas.

The Shirley Mountain SRMA (37,820 acres), North Platte River SRMA (5,060 acres, including a 1/4-mile buffer on both sides of the river), Jelm Mountain SRMA (18,100 acres), Pedro Mountain SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and Rawlins Fishing SRMA (330 acres) would be closed to any salable mineral exploration and development activities.

The five WSAs (66,120 acres) would be unavailable for salable mineral exploration and development activities, precluding any salable mineral operations in these areas.

The Sand Hills ACEC and Potential JO Ranch Expansion (12,680 acres with expansion), Stratton Sagebrush Steppe Research Area (5,530 acres), Cave Creek Cave ACEC (240 acres), Laramie Plains Lakes WHMA (1,600 acres), contributing portions of the Historic Trails area (fewer than 66,370 acres), Blowout Penstemon ACEC (17,060 acres), Upper Muddy Creek/Grizzly WHMA (59,720 acres), Cow Butte/Wild Cow Potential WHMA (49,570 acres), High Savery Dam area (530 acres), and Continental Divide National Scenic Trail SRMA (600 acres) would be closed to any salable mineral exploration and development activities.

VRM actions would be the same as those described in Alternative 1 except that the acreage would be more (346,670 acres; Table 2-9 and Appendix 25).

Water quality, watershed, and soils management actions and their associated impacts would be the same as those described under Alternative 1, except that water impoundments in the Upper Muddy Creek/Grizzly WHMA (Map 2-13) that would result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. Limits imposed by administrative and regulatory requirements would influence the location of any salable mineral disposal sites that might be established.

Wildlife restrictions described in previous sections would apply to proposed mineral material sites (Table 2-1, Wildlife and Fisheries section). Where restrictions severely limit the ability to establish and operate mineral material disposal sites, these activities would be precluded and alternate sites would need to be established. Exceptions to seasonal restrictions might, in some cases, allow development activities to occur at some locations (Appendix 9).

Summary

Leaseable Minerals

Management actions under this alternative would generally be less restrictive than those under Alternative 3 but more restrictive than those under Alternatives 1 and 2. Approximately 73,230 acres would be closed to new oil and gas leasing, thus precluding new oil and gas exploration and development activities, and 218,750 acres would be subject to an NSO stipulation mandating the use of offsite facilities and directional drilling. Implementation of distance and timing restrictions, as well as closures of areas to surface disturbing activities, would lead to a decrease in oil and gas exploration and development activities on the public lands. A slight decrease in the production of oil and gas resources is expected to occur in comparison with Alternative 1. The Rawlins RFD scenario determined that from baseline (no restrictions) conditions, (1) oil production would decrease by 25.1 percent; (2) conventional gas production would decrease by 9.6 percent; (3) coalbed gas production would decrease by 15.2 percent; and (4) total gas production would decrease by 12.7 percent.

Approximately 8,822 wells, or 1-percent fewer wells than in Alternative 1, would be developed during the planning period; of these, 5,111 would access private minerals. Approximately 3,711 federal wells would disturb 22,100 acres out of a total estimated disturbance of 58,000 acres for all wells drilled in the RMPPA.

Locatable Minerals

At least an additional 16,980 acres plus contributing segments of historic trail (NRHP) segments would be closed to locatable mineral entry (Table 2-2 and Map 2-41). This would limit the amount of lands available for locatable mineral exploration and development activities on the public lands. Exploration activity would stay at current levels because the potential for locatable mineral development is considered to be low.

Salable Minerals

Because the disposal of salable minerals under current legal mandates is completely discretionary on the part of the BLM Authorized Officer, any protection measures deemed necessary for the protection of various resource values would be implemented as required. Any resource in conflict with the development of a salable mineral site can provide the basis for applying necessary mitigation measures or denying a request for authorization to establish such a site. Each specific proposal must be evaluated on a case-by-case basis. In some situations, an alternative site can be found; however, this is not always possible. In some areas, suitable replacement deposits may not be available because the deposits are located many miles away. As a result of the long haul distances required from the source area to the use area, utilization is too expensive.

Approximately 287,916 acres would be off-limits to salable mineral disposals. This would limit the amount of lands available for salable mineral exploration and development activities on the public lands.

4.9 OFF-HIGHWAY VEHICLE MANAGEMENT

This section describes potential impacts to OHV management and use from management actions for other resource programs. Existing conditions concerning recreation resources are described in Section 3.9.

Significance Criteria

Impacts to OHV management would be considered significant if either of the following were to occur:

- Management actions result in a long-term elimination of a substantial portion of recreational OHV opportunities or a substantial reduction in the quality of OHV experiences available in the RMPPA.
- Increases in OHV activity create substantial risks to public health and safety.

Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of the RMPPA and resources therein and review of existing literature. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- OHV use will continue to increase as the popularity and availability of OHVs increase.
- The incidence of resource damage and conflicts between OHVs and nonmotorized recreationists will increase with increasing OHV use.
- Proliferation of unauthorized trails and associated resource degradation will continue to occur in spite of BLM efforts at prevention and education.
- All restrictions apply to casual use, but not necessarily to all permitted activities.
- Reclamation will be done and roads closed where necessary to mitigate impacts.
- RFDs and RFAs can be found in Appendix 33.

4.9.1 Impacts Common to All Alternatives

Air quality and wild horse management would have negligible impacts on OHV use.

Cultural resources attract recreational OHV users to the RMPPA. Actions to protect cultural resources, such as fencing, signing, physical barriers, or other methods of restricting access to sensitive cultural properties, would preclude OHV use in some areas. Such actions are rarely necessary; therefore, impacts to OHV use would be minimal.

Historic trails attract recreation OHV users. This is evident from visitors interested in following the historic trails and visiting historic sites associated with the trails. Historic trail use that would result in adverse affects to the trail trace would be evaluated on a case-by-case basis. Where undue degradation is identified, such as use during saturated soil conditions, closures would result that would preclude use of the affected trail segment.

Wildland fire and fuels management treatments would temporarily close areas to OHV use and make treated areas into visually less attractive and undesirable locations for OHV use until successful rehabilitation and revegetation occurs. However, OHV use may increase because of new trails left by suppression activities or from increased wildlife use of burned areas.

Forest management would benefit OHV by allowing harvest of minor wood products to reduce the probability of catastrophic fires that would temporarily displace OHV users. Forest product removal would create skid trails which would increase OHV access. Management of forests to meet forest health and/or multiple-use objectives would help retain the quality of forest recreation opportunities for OHV use in wooded areas.

Wind power development and new transportation and utility ROWs would create new visual intrusions that would alter the scenic qualities and OHV settings in localized areas. These developments would also potentially open new access to areas previously unavailable for OHV use, which would increase OHV opportunities. However, OHV access within these developments may be limited because of mixed land ownership patterns or road closures for public safety.

Lands and realty management actions would pursue land acquisitions within developed and non-developed recreational destination areas, which would enhance OHV opportunities and activities. This action would also alter the OHV settings by the additional visual intrusions from the new access roads and vehicle routes.

Livestock management actions would include the implementation of the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which would maintain hunting, fishing, and wildlife viewing opportunities. The presence of livestock would alter the OHV user experiences and settings, which would displace some users to alternative areas.

Minerals management and associated lands and realty management actions would open new areas to OHV use that may previously have had limited access. Travel off existing roads for “necessary tasks” associated with these and other programs could potentially generate new primitive routes creating new access opportunities for OHV use, but would also affect the OHV setting. Hazards associated with road use would be proportional to the amount of mineral activity in addition to the historic recreational use.

In areas with moderate to high oil and gas potential (Map 4-7), development activity would further alter natural, social, and administrative settings and supplemental values important for OHV use such as scenic quality. The industrialized character associated with oil and gas activity will introduce new contrasting elements affecting the scenic quality, which would displace some OHV to other areas. The back- to middle-country settings would be changed to an industrialized landscape setting, which would interfere with OHV users’ experiences and displace them to other areas. Short-term effects to OHV from the increase in oil and gas development would be improved access to areas otherwise unreachable and additional OHV opportunities. However, in the long term, supplemental values and resources would be altered and would interfere with OHV users’ experiences. Areas most likely to be heavily developed, based on their oil and gas potential (approximately 748,000 acres rated “high potential” and 1,192,000 acres rated “moderate potential”) are concentrated in the Seminoe Reservoir area south of Coal Creek, the area northwest of Hanna, the Atlantic Rim area east of Highway 789, and the expansive area west of Highway 789 north and south of I-80. Large portions of the other areas do not have legal public access because of the checkerboard land pattern. However, the large blocks of public lands with high oil and gas potential outside the checkerboard are likely to be heavily developed, which would displace most OHV users from these areas.

Locatable and salable mineral development would have negligible impacts to OHV use because of the limited scope of activity anticipated, limited acreage of resources available, and discretion to deny salable mineral development permits.

Most OHV users would be satisfied with the abundance of vehicle routes available. OHV use on muddy vehicle routes creates ruts that may be hazardous to other drivers. OHV use increases during hunting season. Hunters often drive saturated roads and cause resource damage because of the limited duration of the hunting seasons. Excessive damage could lead to temporary closure of these roads for rehabilitation, which would cause short-term displacement of OHV users who would have to avoid these areas. Excessive or unauthorized OHV or over-the-snow vehicle use would potentially result in closures or other limitations on OHV opportunities. Increases in OHV use in certain areas could impact public safety.

Paleontological discoveries would potentially be protected by actions such as fencing, signing, physical barriers, or other methods of restricting access. Acreage within these areas would be minimal, which would be a negligible impact to OHV use.

Recreation management actions would potentially increase OHV use, because some recreation attractions are inaccessible without the use of OHVs. These actions could also reduce OHV opportunities in some areas in order to maintain the specific recreational experience so as to avoid user conflicts and to protect resources that create the specific recreational setting. For example, the Encampment River Trail (Map 2-5) is closed to OHV use because OHV use would be in direct conflict with the primitive recreation resource values along the trail.

Some SD/MAs are popular OHV destinations in the RMPPA, whereas others restrict OHV use, such as High Savery Dam Reservoir area. The Pennock Mountain crucial elk winter range, Wick-Beumee WHMA, and Encampment River Canyon crucial bighorn winter range would be closed seasonally. These would preclude and displace OHV use from these areas. Most SD/MAs do not have additional seasonal OHV restrictions (Map 2-10). OHV use would be limited to existing roads and vehicle routes and to offroad use for “necessary tasks,” big game retrieval, and camp site access, which would potentially create primitive routes, thus generating additional OHV accessibility and opportunities but reducing the OHV setting.

Transportation and access management is intended to maintain an adequate road network across the RMPPA. Any development of the transportation network within the RMPPA would alter OHV use patterns. Road closures and restricted access would limit OHV use in some areas, while the construction of new roads or the acquisition of easements across private lands would allow access into new areas for OHV use as discussed above.

Vegetative manipulation projects would generate temporary OHV restrictions in localized areas undergoing treatment. Management of riparian, wetland, and upland vegetation to meet the Wyoming Standards for Healthy Rangelands would improve the quality of the OHV experience by improving scenery and stabilizing soils.

Visual resources are an important determinant of the quality of OHV settings which would protect the scenic qualities of the OHV settings within the areas managed as Class I, Class II, and, in some instances, Class III. Some OHV users seek natural landscape settings and would be displaced from areas managed as Class III and IV, whereas other users seek the experience and opportunities for OHV activity regardless of setting.

Water quality, watershed, and soils management actions that protect riparian areas and waterways would protect and enhance OHV opportunities by preventing degradation of areas that are often focal points for

OHV users when pursuing related recreational activities such as picnicking, wildlife viewing, hunting, or fishing. Water quality, watershed, and soils management efforts to reclaim functionally compromised reservoirs would improve the scenic quality of affected OHV settings. OHV routes would be closed if unacceptable resource damage occurs. Intensive management of OHV use in contributing areas to waterbodies listed as threatened or impaired on the 303d list and other identified watersheds with special management would occur. This intensive management would likely include mitigation or BMPs for managed OHV routes, but would likely not preclude OHV use in many areas (Appendix 13).

In some instances, soil characteristics such as high clay or sand content make areas particularly attractive to OHV enthusiasts. Soil management actions to protect sensitive soils and reduce unacceptable erosion levels may require seasonal restrictions or road closures, which would restrict OHV use in these areas.

Maintaining AMLs for wild horses would provide continued viewing opportunities to OHV users seeking to see wild horses.

Seasonal closures for wildlife that prohibit human presence during specific time periods would limit OHV opportunities and associated uses in some habitat management areas, crucial winter ranges, ACECs, and in areas with potential mountain plover habitat.

4.9.2 Impacts Under Alternative 1: Continuation of Existing Management

Paleontology management and wild horse management would have little or no impact on OHV management.

Cultural resources attract recreational OHV users to the RMPPA. Actions to protect cultural resources, such as fencing, signing, physical barriers, or other methods of restricting access to sensitive cultural properties, would preclude OHV use in some areas. Such actions are rarely necessary; therefore, impacts to OHV use would be minimal.

Historic trails attract recreation OHV users. This is evident from visitors interested in following the historic trails and visiting historic sites associated with the trails. Historic trail use that would result in adverse affects to the trail trace would be evaluated case by case. Where undue degradation is identified, such as use during saturated soil conditions, closures would result that would preclude use of the affected trail segment. Such actions are rarely necessary; therefore, impacts to OHV use would be minimal.

Wildland fire for resource benefit would be used to protect, maintain, and enhance resources. This would help retain the quality of the OHV setting over the long term because excessive fuel loads would be less likely to build up and drive catastrophic fires that would sterilize soils and complicate reclamation. More frequent, less intense fires serve to rejuvenate vegetation and enhance the OHV setting after revegetation occurs. Impacts from fuels management would be the same as the impacts addressed in Impacts Common to All Alternatives.

Forest management would create temporary roads for timber harvesting and similar activities that would be available for OHV use until closed. OHV use would likely be temporarily suspended during logging operations. Traffic hazards, dust, noise, and resource damage to roads and vegetation would occur during logging operations. OHV use on logging roads would prevent natural reclamation of logging roads, thus retaining them as OHV vehicle routes. Timber harvesting actions change the more natural setting that many users seek by creating an expanded network of roads and vehicle routes and often patchy forest communities. Harvested areas result in non-merchantable forest products that would be available for

firewood gathering by the public. This would increase OHV use on temporary roads and skid trails associated with forest product removal.

Lands and realty actions would help preserve the quality of the OHV setting by closing some areas to operation of the public land laws, including disposal, and mineral location under the mining laws in SD/MAs. Avoidance areas for linear transportation facilities and wind farms would also protect desirable settings sought by OHV users on the public lands.

Livestock management actions would include the implementation of the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which would maintain hunting, fishing, and wildlife viewing opportunities. OHV user experiences and settings would be altered, which would possibly displace some users in response to the presence of livestock. Livestock grazing would pose a potential hazard to OHV users where bison are allowed to graze, particularly in larger blocks of public lands where OHV use frequently occurs.

Minerals management actions would open new areas to OHV use that may previously have had no vehicular access. Travel off existing roads for “necessary tasks” associated with these and other programs may generate new two-tracks that could be perceived as existing routes by OHV users. Increased traffic associated with mineral development would pose a hazard to OHV users, particularly on narrow roads that may not accommodate passing vehicles. Facilities associated with oil and gas development convert the area from a predominantly natural setting to a more industrialized setting, which would degrade the localized scenic quality, resulting in avoidance by many OHV users. The presence of livestock would alter the OHV user experiences and settings, which would displace some users to alternative areas. However, these developed roads enhance access to otherwise difficult-to-reach locations.

Existing oil and gas development dominates the landscape in much of the western RMPPA. These lands were once popular for OHV use and other dispersed recreation. In many areas of the Red Desert, development has reached the point that OHV users have sought other places to visit in order to avoid the industrialized setting. Thus mineral development has already had a significant impact on OHV use and management because there has already been a substantial reduction in the quality of OHV experiences available in the RMPPA.

Areas most likely to be heavily developed based on their oil and gas potential (approximately 748,000 acres rated “high potential” and 1,192,000 acres rated “moderate potential”; [Map 4-7]) are concentrated in the Seminoe Reservoir area south of Coal Creek, the area northwest of Hanna, the area east of Highway 789, and the expansive area west of Highway 789 north and south of I-80. OHV use has historically been particularly popular in the blocked public land areas east of Highway 789. Large portions of the other areas do not have legal public access because of the checkerboard land pattern and, therefore, would have little impact on OHV opportunities. However, the large blocks of public lands with high oil and gas potential outside the checkerboard are likely to be heavily developed, which would displace most OHV users from these areas.

Locatable and salable mineral development would have negligible impacts to OHV use because of the limited scope of activity anticipated, limited acreage of resources available, and discretion to deny salable mineral development permits.

OHV actions would close approximately 23,020 acres to vehicles year round, and about 17,910 acres would have seasonal closures, which would displace and preclude OHV use in those areas. The non-vegetated portions of the Dune Ponds Cooperative Management Area (3,730 acres) would be open to driving off roads and vehicle routes. Driving off road for camp site access and big game retrieval would be allowed except in WSAs and specific SD/MAs. Proliferation of primitive routes would continue as a

result of unrestricted offroad travel for camping and big game retrieval. This would alter the OHV setting as well as increase access opportunities for OHV use.

Recreation sites protected with an NSO restriction on oil and gas leasing, intensive management of surface disturbing activities within 1/4 mile surrounding the sites, and closure to locatable mineral entry, mineral material disposal, and operation of the public land laws, including sale, would protect recreational settings at destinations that are frequently visited by OHV users.

Some SD/MA management actions would affect OHV users. The Ferris Mountains WSA (21,880 acres; Map 2-5), High Savery Dam and Reservoir area, and WSRs would be closed to OHV use. The Pennock Mountain crucial elk winter range, Wick-Beumee WHMA, and Encampment River Canyon crucial bighorn winter range would be closed seasonally. Closures would preclude and displace OHV use from these areas. Most SD/MAs do not have additional seasonal OHV restrictions (Map 2-10), and OHV use would be limited to existing roads and vehicle routes. These actions would preserve or enhance the OHV settings and opportunities. SD/MAs that would allow offroad travel for "necessary tasks" and for big game retrieval and camp site access would potentially create primitive routes creating additional OHV accessibility and opportunities but reducing the OHV setting. Motorized use on existing roads and vehicle routes would be allowed in the Encampment River Canyon WSA, Prospect Mountain WSA, and the Bennett Mountains WSA, whereas the Adobe Town WSA will restrict motorized use on designated roads and vehicle routes. This action would provide for additional access and opportunities for OHV users, but would also affect the WSAs' naturalness and remoteness.

Transportation and access management actions would not restrict road densities, which would benefit OHV opportunities through increased access into previously inaccessible areas. This action would also alter the scenic quality of the OHV settings by the addition of new contrasting linear visual elements to the landscape.

Vegetative manipulation projects would generate temporary OHV restrictions in localized areas undergoing treatment. Management of riparian, wetland, and upland vegetation to meet the Wyoming Standards for Healthy Rangelands would improve the quality of the OHV experience by improving scenery and stabilizing soils.

Vegetation actions to eliminate new infestations and control large infestations of noxious and invasive weeds would not eliminate noxious and invasive species that decrease the desirability of OHV settings. Some of these species would continue to degrade the quality of OHV settings.

Visual resources are an important determinant of the quality of OHV settings. VRM would protect the scenic qualities of the OHV settings within the areas managed as Class I, Class II, and, in some instances, Class III. However, the existing Class II VRM in the checkerboard is difficult to manage because BLM has no control over development on private surface, and hence cannot prevent degradation of the visual resources on adjacent private or state lands. This situation would result in degradation of the OHV setting desired by most OHV users. An example of this is the Seminoe Road Coalbed Natural Gas Project, in the checkerboard, where BLM mitigates development on public lands but has little control over development on adjacent private lands. Some OHV users seek natural landscape settings and would be displaced from areas managed as Class III and IV, whereas other users seek the experience and opportunities for OHV activity regardless of setting. Refer to Table 2-9 for VRM classifications and acreages.

Water quality, watershed, and soils management actions that protect riparian areas and waterways would protect and enhance OHV opportunities by preventing degradation of areas that are often focal points for OHV users when pursuing related recreational activities such as picnicking, wildlife viewing, hunting, or fishing. Water quality, watershed, and soils management efforts to reclaim functionally compromised

reservoirs would improve the scenic quality of affected OHV settings. Vehicle routes would be closed if unacceptable resource damage occurs. Intensive management of OHV use in contributing areas to waterbodies listed as threatened or impaired on the 303d list and other identified watersheds with special management would occur. This intensive management would likely include mitigation or BMPs for managed OHV routes, but would likely not preclude OHV use in many areas (Appendix 13). OHV use would be displaced or delayed until appropriate mitigation is completed.

Development on private and state lands would potentially have significant visual impacts such as facilities on ridgelines, bright coloration, and roads built straight up hillsides. These visual impacts would reduce the quality of OHV experiences by degrading the recreational setting.

Other areas where VRM Class II public lands are intermingled with nonfederal lands include the Laramie Mountains, Shirley Mountains, Sierra Madre Mountains, and Snowy Range. Impacts on private lands adjacent to public lands such as road construction, logging, home construction, and mining in these areas would degrade the quality of the OHV setting.

Wildlife and fisheries actions that retain or improve the health of wildlife enhance would in some cases restrict OHV use in managed areas but would also maintain or enhance the quality of OHV opportunities, settings, and experiences.

Summary

Mineral development has already had a significant impact on OHV use and management because there has already been a substantial reduction in the quality of OHV experiences available in the RMPPA. Oil and gas development would continue to create a setting undesirable for some OHV use and users. Over the long term, OHV opportunities are likely to increase, although the quality of these opportunities would significantly decline within areas of heavy resource development, such as those areas with high and moderate oil and gas potential. Most OHV users in these industrialized areas would be displaced to other areas to recreate, so this development would be a significant impact on OHV use. However, these developed roads enhance access to otherwise difficult-to-reach locations.

Proliferation of primitive routes would continue as a result of unrestricted offroad travel for camp site access and big game retrieval and “necessary tasks.” This would alter the OHV setting as well as increase access opportunities for OHV use.

Transportation and access management actions would not consider road densities. Additional degradation of OHV settings from visual the impacts of road construction would be likely. Long-term impacts reducing OHV opportunities would likely occur in areas with sensitive resources as a result of protective road closures and OHV restrictions.

4.9.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from cultural and historic trails; livestock grazing; OHV; recreation resources; transportation and access; vegetation; VRM, water quality, watershed, and soils; wild horses; and wildlife and fisheries management actions would be similar to those identified in Alternative 1. Paleontology would have impacts similar to those described in the Impacts Common to All Alternatives section.

Impacts from wildland fire and fuels management would be fewer than those of Alternative 1 in the short term because all wildfires would be actively suppressed rather than allowed to burn when in prescription. Although fewer acres are likely to be burned and therefore avoided by OHV users, the long-term health of

the vegetation in OHV settings is likely to decline because wildland fire would not be used for resource benefit.

A considerable increase in forest management activities would potentially increase the change and opportunities of the current OHV setting more than in Alternative 1. The increase in forest management activities would create temporary roads for timber harvesting and similar activities that would be available for OHV use until closed. OHV use would likely be temporarily suspended during logging operations. Traffic hazards, dust, noise, and resource damage to roads and vegetation would occur during logging operations. OHV use on logging roads would prevent natural reclamation of logging roads, thus retaining them as OHV vehicle routes. Timber harvesting actions change the more natural setting that many users seek by creating an expanded network of roads and vehicle routes and often patchy forest communities. Harvested areas result in non-merchantable forest products that would be available for firewood gathering by the public. This would increase OHV use on temporary roads and skid trails associated with forest product removal.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Areas with important resources, such as existing and proposed recreation sites and SD/MAs that contain important supplemental values, would be avoided to reduce the impacts of these types of developments where possible (Map 2-31). These facilities would still potentially affect OHV settings within avoidance areas because of the height and size of the facilities, the noise they make, and the visual intrusion that is visible from great distances. Developments of this size would alter the typical middle-country OHV settings in the RMPPA by creating contrasting elements to the existing settings that would alter OHV opportunities and activities in the area.

The impacts from oil and gas development would be similar to those identified under Alternative 1, except that the increase in leasing and drilling activities, along with the decrease in restrictions on surface disturbing and disruptive activities, would increase the acreage undesirable for OHV use by industrializing settings in areas that were historically used for OHV activities.

SD/MA management actions would be the same as in Alternative 1, with the exception of the development of OHV SRMAs, which would provide OHV education through communicating riding ethics and regulations and designate open areas for OHV practice and skill development. This would provide additional OHV opportunities and experiences. All eligible waterway segments would be determined to be non-suitable for inclusion in the National WSR system. All segments would be released from further consideration for WSR. No special protections would be afforded to these segments resulting from WSR management actions, so OHV use would be allowed within 1/4 mile of segments that had been tentatively classified as wild, if not prohibited by other program constraints. These areas open for use would provide for more OHV opportunities and experiences. However, the OHV settings would be diminished by primitive routes created from use associated with “necessary tasks,” offroad use for big game retrieval, and camp site access.

Summary

Mineral development has already had a significant impact on OHV use and management because there has already been a substantial reduction in the quality of OHV experiences available in the RMPPA. Oil and gas development would continue to create a setting undesirable for some OHV use and users. Most OHV users would be displaced to other areas.

4.9.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Cultural; wildland fire and fuels; water quality, watershed, and soils; and wild horse management impacts to OHV would be similar to or the same as impacts described in Alternative 1. Paleontology impacts would not differ from those described in the Impacts Common to All Alternatives section.

An emphasis placed on the achievement of forest health through natural processes would minimize the possibility of conflicts between timber harvest activities and OHV users. There would be no commercial logging, so there would be more decadent timber stands and greater potential for wildland fire resulting from the natural buildup of fuels. In the long term, these actions would result in reduced OHV opportunities and altered OHV settings.

Lands and realty management actions would create large avoidance area acreages in SRMAs and exclusion areas in ACECs that would modify or restrict wind power development. These facilities would still potentially affect OHV settings within and outside avoidance areas because of the height and size of the turbines, roads and road closures, noise, and visual intrusions that would be visible over great distances. Therefore, even though avoidance areas would be closed to wind power development, some OHV users would still potentially be displaced from areas surrounding these developments.

Livestock grazing actions to maintain or enhance wildlife, watershed, and riparian values would enhance OHV settings by improving vegetative cover and soil stability. Changes in class of livestock in HMAs that would benefit wild horses would also enhance the public's wild horse viewing opportunities that are most often experienced using OHVs. Bison would not be allowed in areas of blocked federal surface land ownership (Map 2-34), which would eliminate danger to OHV users from bison impacts.

The impacts from oil and gas development would be similar to those identified under Alternative 1, except that the impacts would be reduced by NSO restrictions, closures to leasing, and closures to locatable mineral entry. These protections would reduce the acreage undesirable for OHV use from mineral development.

Impacts resulting from OHV management would be similar to those identified in Alternative 1. However, OHV use to retrieve big game kills and to access camping sites would be limited to designated or existing roads and vehicle routes, which would reduce proliferation of new two-tracks and maintain the OHV setting. The entire Dune Ponds Cooperative Management Area would be closed to OHV use, which would interfere with the goals and opportunities of OHV users and displace OHV users to other areas open for OHV use. Access to once-reachable areas would be more difficult or impossible for some users, resulting in negative impacts such as goal interference and loss of opportunities.

The recreation management actions would have the same impacts as in Alternative 1, in addition to the following:

- Four new SRMAs—Jelm Mountain, Pedro Mountains, Rawlins Fishing, and Laramie Plains Lakes (38,680 acres)—would limit OHV use to designated roads and vehicle routes within their boundaries.

The SD/MA management actions would have the same impacts as in Alternative 1, in addition to the following:

- Historic trails would be managed as an ACEC with more restrictions on surface disturbing activities. However, impacts to OHV would be minimal.

- The Adobe Town (approximately 32,650 acres), Prospect Mountain (1,140 acres), Encampment River Canyon (4,500 acres), and Bennett Mountains (5,950 acres) WSAs would be closed to all types of motorized vehicle use. This would impact OHV use because of reduced OHV opportunities in these areas. None of the routes extends more than 3/4 mile into the WSA, and thus does not provide a substantial OHV experience. Closure of these four WSAs would collectively be a reduction of approximately 5 miles of vehicle routes in the RMPPA.
- Land tenure adjustments associated with actions specific to each SD/MA, including acquisition of lands, easements, or exchange, would provide improved access where federal land is acquired.
- Seasonal closures would be implemented as necessary in the Sand Hills ACEC and the JO Ranch Expansion (12,680 acres), which would result in a minor reduction in OHV use because of a loss of OHV opportunities in this area.
- The Sand Hills ACEC and JO Ranch (12,680 acres) and the Jep Canyon WHMA (13,810 acres) would be closed to over-the-snow vehicles, which would reduce opportunities for recreational winter OHV use in this area.
- Closures of specific roads and vehicle routes within the Upper Muddy Creek Watershed/Grizzly ACEC (59,720 acres) and White-Tailed Prairie Dog ACEC (undeterminable acreage located within eight specific complexes) would reduce the number of roads and vehicle routes available for OHV use in this area.
- Seasonal closures to motor vehicles would be implemented as needed in the Upper Muddy Creek Watershed ACEC, which would cause temporary impacts to OHV use from a loss of opportunities during seasonal closures.
- OHV use for “necessary tasks,” big game retrieval, and camp site access is not permitted in the Como Bluffs NNL, Sand Hills and JO Ranch Expansion ACEC, Jep Canyon WHMA, Shamrock Hills RCA, Stratton Sagebrush Steppe Research Area ACEC, Chain Lakes ACEC, Laramie Peak ACEC, Red Rim-Daley ACEC, Pennock Mountain WHMA, Wick-Beumee WHMA, Cave Creek Cave ACEC, Laramie Plains Lakes ACEC, Blowout Penstemon ACEC, Upper Muddy Creek Watershed/Grizzly ACEC, and Cow Butte/Wild Cow WHMA. The closure to offroad OHV use would maintain the OHV setting.

Transportation and access management actions would not allow BLM road densities to achieve levels that would diminish or adversely affect other resources or resource values. This would maintain the OHV setting and opportunities available in the RMPPA.

Vegetation actions to attain native, weed-free plant communities would enhance OHV opportunities by eliminating non-native thistles and other noxious and invasive weed species that decrease the desirability of OHV settings.

VRM designations would be similar to those of Alternative 1, except for the addition of some VRM Class II in areas where it is desirable to improve the quality of visual resources. These areas include the foothills of the Ferris Mountains, several areas abutting Adobe Town WSA, the JO Ranch area, and the North Platte River SRMA between Bennett Peak and Saratoga. This additional VRM Class II would help preserve the visual quality of these OHV settings.

Seasonal OHV and over-the-snow vehicle use would be prohibited in specific big game crucial winter range to reduce conflicts between OHV use and maintenance of wildlife habitat values. This would reduce winter OHV opportunities in localized areas.

Summary

Mineral development has already had a significant impact on OHV use and management because there has already been a substantial reduction in the quality of OHV experiences available in the RMPPA. Minerals management impacts would be reduced by NSO restrictions, closures to leasing, and closures to locatable mineral entry. These protections would reduce the acreage made undesirable for OHV use by mineral development.

This alternative provides the greatest protection to resources that enhance OHV settings. However, because of these protections, many areas would restrict or preclude OHV use, limiting OHV opportunities and displacing users. Impacts would occur to OHV users seeking open, unconfined OHV opportunities under this alternative because there would be no open offroad opportunities in the RMPPA. Exclusion of offroad travel for camping and big game retrieval, closure of WSAs to vehicles, creation of new ACECs with OHV restrictions, and limiting of travel to designated roads and vehicle routes in various SD/MAs would reduce the quantity of OHV opportunities. These exclusions would also potentially reduce the creation of primitive routes and retain the quality of OHV settings. Overall, these impacts are expected to be minor.

4.9.5 Impacts Under Alternative 4: Proposed Plan

Cultural and historic trails; wildland fire and fuels; forest; lands and realty; water quality, watershed, and soils; wild horses; and wildlife and fish management impacts would be similar to those identified in Alternative 1. Paleontology impacts would be similar to those described in the Impacts Common to All Alternatives section.

Livestock management actions would have the same impacts as in Alternative 3.

Minerals management actions would have similar impacts as in Alternative 1; however, there would be slightly fewer oil and gas wells and facilities developed.

OHV management actions would range from being similar to more restrictive than those identified in Alternative 1. Restricting offroad driving to retrieve downed big game animals and to access camp sites (limited to 300 feet off established roads and vehicle routes) would reduce proliferation of new two-tracks, while still providing for limited game retrieval and camping opportunities.

The recreation management actions would have the same impacts as in Alternative 1, in addition to the following:

- Four new SRMAs—Jelm Mountain, Pedro Mountains, Rawlins Fishing, and Laramie Plains Lakes (38,680 acres)—would limit OHV use to designated roads and vehicle routes within their boundaries.

The SD/MA management actions would have the same impacts as in Alternative 1, in addition to the following:

The Prospect Mountain, Encampment River Canyon, Bennett Mountains, and Adobe Town WSAs (44,240 acres total) would be closed to all types of motorized vehicle use. Closure of these four WSAs would cumulatively be a reduction of approximately 5 miles of vehicle routes. This would result in a negligible reduction in OHV opportunities in the RMPPA. Motor vehicle travel in the Ferris Mountains WSA would be limited to designated roads and vehicle routes. When implemented, motor vehicle travel would be allowed only on roads designated as open to such travel. All other roads in the area would

remain closed to motor vehicle use. This action would enhance OHV opportunities to access primitive camp sites once inaccessible to motorized vehicles, but would also potentially affect the WSAs' settings of naturalness, solitude, and remoteness. However, management under the IMP would ensure that these wilderness characteristics are not compromised to the level of non-designation of wilderness.

These actions are in response to the Interim Management Policy for Lands Under Wilderness Review so as to maintain or enhance the wilderness characters of the WSAs. This would be an interim designation, pending Congressional action on WSAs. If WSAs were designated as Wilderness," motorized roads and vehicle routes within the boundary would be managed according to direction provided by the enabling legislation.

- Land tenure adjustments associated with actions specific to each SD/MA, including acquisition of lands, easements, or exchange, would impact OHV use by providing improved access where federal land is acquired.
- Seasonal closures would be implemented in the Sand Hills and JO Ranch Expansion ACEC (12,680 acres), which would cause a minimal, short-term loss of OHV opportunity in this area.
- The Sand Hills ACEC and proposed JO expansion (12,680 acres) and the Jep Canyon WHMA (13,810 acres) would be closed to over-the-snow vehicles, thus reducing opportunities for winter OHV use in this area.
- Closures of specific roads and vehicle routes within the Upper Muddy Creek WHMA (59,720 acres) would cause a minimal loss of OHV opportunities in this area.
- The Encampment River would be determined to be suitable for inclusion in the WSR system. There are no vehicle routes within 1/4 mile of the river along this segment, so this determination would have no impact on OHV opportunities. The remainder of the waterway segments would be determined to be nonsuitable and released from further consideration for WSR. No special protections would be afforded to these nonsuitable segments.
- Four new SRMAs—Jelm Mountain, Pedro Mountains, Rawlins Fishing, and Laramie Plains Lakes (38,680 acres)—would limit OHV use to designated roads and vehicle routes within their boundaries.
- OHV use for "necessary tasks" and big game retrieval and camp site access is not permitted in the Stratton Sagebrush Steppe Research Area, Laramie Peak WHMA, Laramie Plains Lakes WHMA, and Blowout Penstemon ACEC. This would maintain the OHV setting.

Transportation and access management actions would consider BLM road densities during analysis and authorization of surface disturbing activities. Transportation and access management impacts to OHV would be the same as in Alternative 3.

Vegetation actions to eliminate new infestations and control large infestations of noxious and invasive weeds would not eliminate invasive and noxious species that decrease the desirability of OHV settings. Some of these species would continue to degrade the quality of OHV settings.

VRM designations would be similar to those of Alternative 1, except that VRM Class II and Class III areas would be adjusted. Areas would be designated Class II where it is desirable to improve the quality of visual resources. These areas include the foothills of the Ferris Mountains, the Pedro Mountains, portions of the Seminoe Mountains, and the JO Ranch area. This additional VRM Class II would help preserve the visual quality of these OHV settings.

Checkerboard areas, where BLM cannot influence development on adjacent private and state lands, would be designated as VRM Class III. The lack of legal public access in the checkerboard limits OHV opportunities. The Shirley Mountains, where forest management and intermingled private lands make Class II management impractical, would be designated as VRM Class III. This would not impact the overall quality of OHV settings.

Seasonal OHV and over-the-snow vehicle use would be prohibited in specific big game crucial winter range to reduce conflicts between OHV use and maintenance of wildlife habitat values. This would reduce winter OHV opportunities in localized areas.

Summary

Mineral development has already had a significant impact on OHV use and management because there has already been a substantial reduction in the quality of OHV experiences available in the RMPPA. Oil and gas development would continue to create a setting undesirable for some OHV use and users. Over the long term, OHV opportunities are likely to increase, although the quality of these opportunities would significantly decline within areas of heavy resource development, such as those areas with high and moderate oil and gas potential. Most OHV users in these industrialized areas would be displaced to other areas to recreate, so this development would be a significant impact on OHV. However, these developed roads enhance access to otherwise difficult-to-reach locations.

OHV, SD/MA, and wildlife management actions would limit or preclude OHV use in some areas to preserve important resource values, which would preserve or improve the OHV setting and still allow access opportunities. However, impacts would be goal interference and displacement of users who enjoy OHV experiences. Designating roads in the Ferris Mountain WSA will provide access to the WSA for OHV users, which would enhance OHV opportunities, activities, and experiences. This action would potentially affect the OHV settings of naturalness and solitude with the additional presence of OHVs in the WSA.

4.10 PALEONTOLOGY

This section presents potential impacts to paleontological resources and their management from management actions of other resource programs. Existing conditions regarding paleontology are described in Section 3.10.

Significance Criteria

Impacts to paleontological resources would be considered significant if the following were to occur:

- An action or development causes substantial direct or indirect damage or destruction to important paleontological resources.

Methods of Analysis

The analysis of environmental impacts is based on interdisciplinary team knowledge of resources and the project area, review of existing literature, spatial analysis using ArcGIS software, and information provided by other agencies and institutions. Effects are quantified where possible. In cases where quantitative data are not readily available, best professional judgment is used to describe impacts. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- Significant fossils may be expected throughout the Cretaceous and Tertiary units exposed in the RMPPA. Significant fossils may occasionally be found in older or younger units but are less common.
- Inventories required prior to surface disturbance in high-probability areas would result in the identification and evaluation of previously undiscovered resources, which BLM would then manage accordingly.
- Surface disturbing and other disruptive activities could dislocate or damage paleontological resources that were not discovered prior to surface disturbance (i.e., unanticipated discoveries). Destruction of these resources would result in a loss of scientific information and preclude interpretation of the resource values to the public.

4.10.1 Impacts Common to All Alternatives

Air quality, cultural resource, forest, socioeconomics, VRM, and wild horse management actions would have little or no impact to paleontological resources.

Impacts to fossil resources would occur from wildland fire suppression and rehabilitation activities (e.g., construction of fire lines, bulldozing of access roads, and general movement of heavy equipment) and post-fire rehabilitation activities. Displacement of paleontological resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data. Because of the unplanned nature of wildland fires, impacts to paleontological resources from wildland fires and suppression activities are generally assessed and mitigated subsequent to the fire.

Surface disturbing and other disruptive activities resulting from lands and realty, livestock grazing, minerals, OHV, recreation resources, vegetation, and wildlife and fisheries management actions would have the potential to directly impact paleontological resources not identified prior to the activity.

Unanticipated subsurface discoveries (paleontological resources discovered during ground disturbing activities) would occur from surface disturbing and other disruptive activities. Unanticipated discoveries would result in displacement or loss (either complete or partial) of the paleontological resource involved. Displacement of paleontological resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data. However, mitigation of impacts from discoveries is often accomplished through data recovery excavations. The number of unanticipated discoveries would be minor but potentially concentrated in areas with geological formations that are known to have a high fossil yield class. Potential impacts to paleontological resources identified in a discovery situation would be greater than impacts to resources that were previously identified (and thereby avoided or subjected to mitigation measures) because damage to discovered sites occurs prior to their recordation and evaluation, thereby complicating mitigation procedures.

Lands and realty management actions not associated with minerals development would disturb approximately 5,794 acres over the 20-year planning period under all alternatives. These actions would potentially affect paleontological resources. Required paleontological inventory, recordation, and mitigation procedures conducted in conjunction with ROW actions would serve to protect most paleontological resources from significant damage and increase the database of known paleontology sites. A small but proportional number of these sites would be adversely impacted as a result of unanticipated discoveries, potentially resulting in significant impacts. Paleontological resources would be protected from surface disturbing activities associated with locatable mineral entry on 935,530 acres of existing withdrawn lands.

Implementing the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve soil stability and vegetation cover, thereby indirectly protecting paleontological resources. Overuse of an area by livestock, wildlife, and wild horses would potentially accelerate soil erosion, which would potentially lead to the indirect exposure and destruction of paleontological resources. Animal trampling and wallowing directly impacts fossils on or just below the surface through breakage and scattering. Long-term impacts from grazing would potentially occur from repeated trampling on paleontological sites over time, especially along fence lines, near water sources, and in sheltered or shaded areas. Proper construction of water developments and range improvements as well as proper placement of salt and mineral supplements would help minimize adverse impacts to paleontological resources. Areas would be inventoried and evaluated for paleontological resources prior to the construction of fences, water developments, and other range improvements, and appropriate mitigation measures would be implemented if needed.

Identification and mitigation measures conducted in conjunction with vegetation treatments would protect sensitive paleontological resources from significant damage. Protection for threatened, endangered, proposed, and candidate species would provide protection for paleontological resources.

Activities associated with leaseable minerals management have the greatest potential to directly and indirectly impact paleontological resources because of the amount of disturbance proposed for the life of the plan. Unlike many of the other resource management actions, the proposed disturbance from minerals management would be limited to specific areas within the RMPPA (Map 4-7, Oil and Gas Project Areas and High and Moderate Potential Areas). Approximately 25 percent of the Class 5 fossil yield formations lie within high and moderate oil and gas potential areas.

Based on information collected from Shoup (2006), paleontological resources would only be impacted by vibroseis exploration operations if a vibroseis buggy were to travel or lower the shaker plate directly over a site. Paleontological field surveys completed prior to conducting exploration operations would significantly reduce the potential for impacts to paleontological resources. If proposed routes and energy

source points were determined to directly intersect paleontological sites, those routes and source points would be realigned prior to the operation commencing to eliminate any potential impacts to those sites.

Locatable mineral activity requires that a notice be submitted for surface disturbing activities of 5 acres or fewer and a Plan of Operations for more than 5 acres. Both require the operator to cease operations immediately and notify the Authorized Officer if paleontological resources are encountered. Because of these provisions, impacts are anticipated to be minimal.

Mineral material permits are discretionary. In areas of high potential, a paleontological survey is required prior to beginning surface disturbing activity. If paleontological resources are identified, mitigation is developed or the permit is denied. Impacts from mineral materials management are anticipated to be negligible.

OHV use on improved roads would have negligible effects on paleontological resources. However, the majority of unimproved two-track roads and vehicle routes within the RMPPA have not been inventoried for paleontological resources, increasing the potential for unmitigated impacts. OHV use of these roads and vehicle routes would disturb or displace paleontological resources located within the roadways. Inappropriate use of unimproved roads and vehicle routes by OHVs would accelerate erosion and thus indirectly disturb deposits that contain paleontological resources. Where impacts to paleontological resources from OHV use are identified, closures to motorized vehicle use may occur to protect sensitive paleontological resources. Impacts to paleontological resources from offroad OHV use for “necessary tasks” would be negligible.

Management actions associated with paleontological resources would provide direct protection to paleontological sites from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity and include measures such as paleontological inventory and mitigation of potential effects, generally through avoidance. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve paleontological resources, mitigation measures would be prescribed on a case-by-case basis, depending upon the nature of the action and the type of paleontological resource involved. Mitigation measures would ensure that any potential impact from the proposed action would not result in significant effects to known paleontological sites. These management actions would apply to any proposed actions that have the potential to impact paleontological resources.

Paleontological resource inventory, recordation, evaluation, and data recovery excavation would increase the site database and further our understanding of fauna and flora from geologic times. This increased knowledge would allow for the implementation of revised and more appropriate practices to manage future undertakings. Data recovery excavations would remove all or a portion of in situ paleontological materials at sites, but would require an approved research design to minimize future data loss should new data recovery and analysis techniques be developed.

Allowing dispersed recreation throughout the entire field office would potentially increase the amount of incidental or purposeful disturbance of paleontological resources. Unauthorized disturbance would result in displacement or loss (either complete or partial) of the paleontological resource involved. Displacement of paleontological resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data.

SRMA management would encourage recreation and development of facilities, which could result in damage to paleontological resources through ground disturbing activities and indirectly through the larger presence of human activity. Paleontological surveys and appropriate mitigation would be completed before any new facilities were constructed within high fossil yield formations.

Protections afforded to SD/MAs (i.e., intensive management of surface disturbing and other disruptive activities) would indirectly protect paleontological resources located in these areas by reducing the potential for unanticipated discoveries and subsequent loss of data. ROW exclusion requirements and NSO stipulations would provide the greatest level of protection by prohibiting surface disturbing activities.

Transportation and access management would impact paleontological resources by pursuing new access areas (Table 2-8) and consolidating public lands to increase recreational opportunities in these new areas, which would increase the potential for incidental or purposeful disturbance of paleontological resources. Facilitating use of these areas would result in increased surface disturbing and other disruptive recreational activity and loss of vegetative cover, which would increase the potential for exposure and destruction of paleontological resources.

Actions designed to maintain vegetation resources would indirectly protect paleontological resources by managing surface disturbance and minimizing soil erosion, which would help prevent the degradation of soils that may contain paleontological resources. Achieving the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve environmental conditions, soil stability, and vegetation cover, thereby protecting paleontological resources from exposure, deterioration, and loss. Vegetation treatments would reduce cover in the short term, allowing otherwise undetected paleontological materials to be identified and recorded. However, vegetation treatments would also likely increase soil erosion in the short term and potentially result in indirect displacement and/or loss of paleontological resources. Displacement of paleontological resources adversely affects the potential to understand the context of the site and limits the ability to extrapolate data. BMPs and conservation measures designed to protect vegetation communities through avoidance or by limiting surface disturbance would indirectly protect paleontological resources in these areas.

Requiring that surface disturbing and other disruptive activities avoid identified 100-year floodplains; areas within 500 feet of perennial waters, springs, and wetland/riparian areas; and areas within 100 feet of the inner gorge of ephemeral channels would provide additional protection to paleontological resources located in these areas by reducing the potential for such activities to adversely affect paleontological resources through displacement or loss.

Controlling or preventing surface disturbing and other disruptive activities in wetland/riparian areas would protect paleontological resources in these areas by reducing the potential for unanticipated discoveries. Soils management would provide long-term indirect benefits to paleontological resources by minimizing soil erosion, thereby preserving paleontological properties. Surface disturbing activities associated with water quality, watershed, and soils management would require standard inventory and mitigation measures to minimize impacts on paleontological resources.

Restrictions on surface disturbing and other disruptive activities as a result of wildlife and fisheries management actions and compliance with the ESA would provide indirect protections for paleontological resources. Intensive management of surface disturbing and other disruptive activities in all RCAs would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect paleontological deposits located in these areas. In addition, minimizing construction disturbance would indirectly protect paleontological resources by limiting the area of disturbance.

4.10.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, cultural resource, forest, socioeconomics, VRM, and wild horse management actions would have little or no impact to paleontological resources.

Wildland fire suppression activities would be managed for AMR, which would consider protection of natural and cultural resources. This would help reduce damage to paleontological resources caused by suppression activities by considering these resources when determining the degree and location of suppression activities.

Approximately 63,460 acres would be considered for disposal under the lands and realty management program. Land disposal would place undiscovered paleontological resources outside of federal jurisdiction and thereby eliminate protection under federal management policies. Inventories and evaluations for paleontological resources are required before land disposal, which would ensure adequate data recovery and documentation of paleontological resources discovered during inventories. BLM may retain lands containing scientifically significant paleontological resources, providing protection under federal management policies. However, the potential exists to dispose of lands containing paleontological resources that were not discovered during inventories.

Withdrawals would be pursued on approximately 63,670 acres, which would result in closure of these areas to locatable mineral entry and future land disposal actions. This would provide additional protection to paleontological resources located in these areas by reducing surface disturbing and other disruptive activities and eliminating the possibility of placing undiscovered paleontological resources outside of federal jurisdiction. Requiring that construction of new facilities and routes avoid areas with important resource values would also serve to lessen the impacts from surface disturbance.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Because of the large-scale nature of these types of developments, there would be the potential to adversely affect paleontological sites. Areas with important resource values such as significant paleontological resources would be avoided where possible to reduce the impacts from these types of developments (Map 2-30). Where it becomes necessary to place the developments within the avoidance areas, the effects would be intensively managed to reduce the impacts. In addition, oil and gas leasing, locatable mineral entry, and mineral material disposals within 1/4 mile of the incorporated boundaries of cities and towns (1,500 total acres) would be intensively managed. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect paleontological deposits within these areas.

Construction of livestock range improvements would impact approximately 900 acres over the 20-year planning period, which could damage or dislocate paleontological resources in these areas that were not discovered prior to surface disturbance. Standard inventory and mitigation procedures within high fossil yield areas conducted in conjunction with range improvement actions would protect most paleontological resources from significant damage and would increase the database of known paleontological sites. A small but proportional number of these sites would be adversely impacted as a result of unanticipated discoveries but would be mitigated through standard treatment measures. Designing livestock grazing systems to improve or maintain desired range conditions would maintain vegetative cover and soil stability and thereby prevent the indirect exposure and deterioration of paleontological resources.

It is anticipated that 8,945 oil and gas wells would be drilled, disturbing approximately 61,900 acres of land (including all related facilities and pipelines). This would result in surface disturbance and potential damage to paleontological resources that were not discovered prior to surface disturbance. Destruction of these resources would result in a loss of scientific information and preclude interpretation of the resource values to the public. Standard identification and mitigation measures conducted in conjunction with mineral development would protect most paleontological resources from significant damage and would increase the database of known paleontological sites. A small but proportional number of these sites would be adversely impacted as a result of unanticipated discoveries and trespass violations but would be

mitigated through standard treatment measures. In addition, special stipulations would be added to new oil and gas leases where specific paleontological resource values have been identified. Locatable mineral activity requires that a Notice be submitted for surface disturbing activities of 5 acres or fewer and a Plan of Operations for more than 5 acres. Both require the operator to cease operations immediately and notify the Authorized Officer if paleontological resources are encountered. Because of these provisions, impacts are anticipated to be minimal.

Mineral material permits are discretionary; in areas of high potential, a paleontological survey is required prior to beginning surface disturbing activity. If paleontological resources are identified, mitigation is developed or the permit is denied. Impacts from mineral materials management are anticipated to be negligible.

Management actions associated with paleontological resources would provide direct protection to paleontological properties from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity and include measures such as paleontological resource inventory, application of BMPs, and mitigation of potential effects, generally through avoidance. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve paleontological resources, mitigation measures would be prescribed on a case-by-case basis, depending on the nature of the action and the type of paleontological resource involved. Mitigation measures would ensure that any potential impact from the proposed action would not result in significant effects to paleontological resources.

Although impacts to paleontological resources could occur from recreation activities, certain recreation areas would be managed to limit surface disturbance. Implementing an NSO stipulation for oil and gas development activities in developed and undeveloped recreation sites (9,660 acres) and intensively managing such activity within 1/4 mile of these sites (7,930 acres) would limit surface disturbance and thereby help prevent damage to paleontological resources located in these areas. Closing developed recreation sites (5,560 acres) to locatable mineral entries and mineral material disposals would provide further protection from surface disturbing and other disruptive activities. In addition, surface disturbing and other disruptive activities would be intensively managed in the west end of the Ferris Mountains and the Adobe Town fringe areas, which would reduce the potential for dislocation and damage of paleontological resources in these areas.

The Shirley Mountain SRMA (24,400 acres) and North Platte River SRMA (5,060 acres, including 1/4 mile on either side of the river) would require intensive management of surface disturbing and other disruptive activities. Intensive management would potentially restrict the amount and size of surface disturbance, indirectly decreasing the potential to disturb buried paleontological deposits located within the SRMAs.

Impacts to paleontological resources from management actions associated with the Shirley Mountain area, Continental Divide National Scenic Trail area, OHV areas, Jelm Mountain area, Pedro Mountains area, Laramie Plains Lakes area, and Rawlins Fishing area SRMAs would be negligible.

Impacts to paleontological resources from management actions associated with the Shamrock Hills area, Laramie Peak area, Red Rim-Daley area, Pennock Mountain area, Shirley Mountain area, Blowout Penstemon area, White-Tailed Prairie Dog area, and High Savery Dam and Reservoir area SD/MAs would be negligible.

Surface use restrictions associated with management of SD/MAs would indirectly protect paleontological resources located in these areas by reducing the potential for unanticipated discoveries and subsequent loss of paleontological information. The Como Bluff area (1,690 acres), Sand Hills area (7,960 acres), Jep

Canyon area (13,810 acres), Chain Lakes area (30,560 acres), Wick-Beumee area (280 acres), Shirley Mountain and Cave Creek Cave area (24,440 acres), Laramie Plains Lakes area (1,600 acres), Historic Trails area (no special designation acres), Upper Muddy Creek Watershed/Grizzly area (26,850 acres), Cow Butte/Wild Cow area (no special designation acres), and North Platte River area (5,060 acres) would require intensive management of surface disturbing and other disruptive activities. The Sand Hills Area ACEC (7,960 acres), Jep Canyon ACEC (13,810 acres), Chain Lakes WHMA (30,560 acres), Wick-Beumee WHMA (280 acres), Laramie Plains Lakes area (1,600 acres), Upper Muddy Creek Watershed/Grizzly area (26,850 acres), and White-Tailed Prairie Dog area would require intensive management of surface disturbing and other disruptive activities. Intensive management would potentially restrict the amount and size of surface disturbance, indirectly decreasing the potential to disturb buried paleontological deposits located within the SD/MAs.

All surface disturbing and other disruptive activities within WSAs (66,120 acres) and within 1/4 mile of the Encampment River WSR (Map 2-19) and surface disturbance associated with new leases within the Stratton Sagebrush Steppe Research Area ACEC (5,530 acres) would be prohibited, thereby providing the greatest level of protection to paleontological resources.

Vegetation and weed treatments would impact approximately 106,000 acres in the RMPPA over the next 20 years. Identification and mitigation measures conducted in conjunction with vegetation treatments would serve to protect sensitive paleontological resources from significant damage.

Protections afforded Special Status Plant Species and habitat would indirectly protect paleontological resources by restricting the amount and size of disturbances that would potentially adversely affect paleontological resources through displacement or loss. Activities associated with oil and gas leasing would be intensively managed in areas of occupied habitat for threatened, endangered, proposed, and candidate plant species. All surface disturbing activities would be intensively managed in blowout penstemon habitat. Recreational sites would not be authorized in Colorado butterfly plant habitat or in Ute ladies'-tresses plant habitat.

Erosion caused by surface discharge of produced water in the Colorado River Basin, the North Platte River Basin, and the Great Divide Basin would potentially cause indirect adverse affects to paleontological resources located near the stream channel through displacement or loss.

Surface use restrictions associated with management of wildlife and fisheries would indirectly protect paleontological resources located in specific areas by reducing the potential for unanticipated discoveries and subsequent loss of cultural information. Surface disturbing and disruptive activities would be intensively managed in RCAs, neotropical and other migratory bird habitats, upland game bird habitats, amphibian habitats, reptile habitats, and crucial habitat for other sensitive species. Intensive management would potentially restrict the amount and size of surface disturbance, indirectly decreasing the potential to adversely affect paleontological deposits located within these areas. In addition, well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence would not be allowed within 825 feet of active raptor nests (1,200 feet for ferruginous hawks), and surface disturbing and disruptive activities would be avoided within white-tailed and black-tailed prairie dog towns. Paleontological resources located within these areas would be indirectly protected from displacement or loss.

Summary

An anticipated 98,340 acres would be disturbed as a result of lands and realty management, livestock management, and minerals management activities. This disturbance would potentially result in

dislocation, damage, or destruction of paleontological resources that were not discovered prior to surface disturbance (i.e., unanticipated discoveries).

As a result of WSAs, SD/MAs, and NSO stipulations, 319,410 acres would be protected from surface disturbing and other disruptive activities. These management actions would provide the greatest indirect protection to paleontological resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. In addition, actions associated with water quality, watershed, and soils management and with wildlife and fisheries management would provide indirect protection to paleontological resources through avoidance and intensive mitigation of surface disturbing and other disruptive activities.

It is anticipated that adverse impacts to paleontological resources would occur, but, with the proper application of mitigation measures, impacts are expected to be minimal. As discussed above, any surface disturbance has the potential to damage and/or destroy paleontological sites through unanticipated discoveries (i.e., paleontological resources discovered during ground disturbing activities). Unanticipated discoveries would result in the loss of some or occasionally all of the paleontological resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most paleontological resources from significant damage. The potential for significant impacts would be directly proportional to the amount of surface disturbance.

4.10.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, cultural resource, forest, socioeconomics, VRM, and wild horse management actions would have little or no impact to paleontological resources.

Impacts from locatable and minerals material management are anticipated to be similar to those in Alternative 1.

The impacts to paleontological resources from lands and realty actions excluding withdrawals and disposals; paleontology; recreation; and water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Impacts to paleontological resources from fire and fuels management would be similar to those identified in Alternative 1, except that more wildland fires would be suppressed. Increased suppression would increase the potential for catastrophic fires in the long term through the buildup of flammable materials that would damage a wider range of paleontological resource types.

Impacts to paleontological resources from lands and realty management would be similar to those identified in Alternative 1, except that 57,270 fewer acres would be pursued for withdrawal. This would result in closure of these areas to locatable mineral entry and future disposal actions, thereby reducing the level of protection to paleontological resources located in these areas by increasing surface disturbing and other disruptive activities. Furthermore, an additional 14,780 acres would be precluded from disposal actions. This would further reduce the amount of land that could be removed from federal jurisdiction and therefore the number of paleontological resources that could be exempt from federal management policies.

It is anticipated that 1,140 acres would be disturbed through construction of livestock range improvements. Although the increase in surface disturbance is minimal (240 acres) compared to that of Alternative 1, it would slightly increase the potential for damage to undocumented resources.

Impacts to paleontological resources from oil and gas management would be similar to those impacts identified in Alternative 1, except that more acreage would be open to oil and gas leasing with fewer restrictions from other programs. Areas closed to leasing or otherwise restricted from development, surface disturbing and other disruptive activities, or surface occupancy would be reduced. Overall, approximately 9,198 wells would be drilled over the next 20 years disturbing approximately 63,650 acres (including all related facilities and pipelines). The increase in disturbed acres would slightly increase the potential for inadvertent damage to previously unknown resources as well as the potential for identification of paleontological resources. However, a greater number of paleontological resource inventories and site mitigations (e.g., excavations) would be required, which would expand the paleontological resource database.

As needs are identified, OHV areas would be developed to allow use and promote education. Unrestricted use would potentially promote soil erosion, disturbing or displacing paleontological resources. Identification and mitigation measures would ensure that any potential impact associated with OHV would be reduced to the extent possible.

Impacts to paleontological resources from SD/MAs would be similar to those impacts identified in Alternative 1, except that the NSO stipulation on new leases within the Stratton Sagebrush Steppe Research Area ACEC (5,530 acres) would not be required. Instead, operators would be required to submit a management plan to describe how activities would affect research objectives, which would lead to the implementation of BMPs and necessary mitigation measures. As a result, surface disturbance associated with new leases would likely occur within the ACEC, thereby increasing the potential for unanticipated discoveries of paleontological resources.

Impacts from vegetation management actions on paleontological resources would be similar to those identified in Alternative 1, except that vegetation and weed treatments would be increased to approximately 1,003,720 acres over the next 20 years. No additional protections would be afforded BLM state sensitive plant species under this alternative; therefore, there would be no indirect protections for paleontological resources in these areas.

Summary

Under Alternative 2, impacts to paleontological resources would be similar to those impacts identified in Alternative 1. However, a slightly greater number of acres would be disturbed, potentially impacting an increased number of paleontological resources. It is anticipated that 98,793 acres would be disturbed as a result of lands and realty management, livestock management, and minerals management activities. This disturbance would potentially result in dislocation, damage, or destruction of paleontological resources that were not discovered prior to surface disturbance.

Approximately 224,420 acres would be protected from surface disturbing and other disruptive activities as a result of WSAs, SD/MAs, and NSO stipulations. These management actions would provide the greatest indirect protection to paleontological resources by eliminating the potential for surface disturbing activities in these areas. In addition, there would be less indirect protection to paleontological resources because of the reduction of restrictions included in management actions for other resource programs.

It is anticipated that significant impacts to paleontological resources would occur. As discussed in the above analysis, any surface disturbance has the potential to damage and/or destroy paleontological properties through unanticipated discoveries (i.e., paleontological resources discovered during ground disturbing activities). Unanticipated discoveries result in the loss of some or occasionally all of the paleontological resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most paleontological

resources from significant damage. Because disturbance of more surface acres is anticipated, the potential for significant impacts would increase as compared with Alternative 1.

4.10.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, cultural resource management, forest management, socioeconomics, VRM, and wild horse management actions would have little or no impact on paleontological resources.

Impacts from locatable and minerals material management are anticipated to be similar to those in Alternative 1.

Fewer wildland fires would be suppressed under this alternative than under Alternative 1. Wildland fires would likely increase in intensity, which would result in increased soil erosion, greater loss of vegetation, slower recovery of plant communities, and consequential indirect deterioration of paleontological properties. However, the potential for damage to paleontological resources from fire suppression activities would be decreased from Alternative 1, because there would be fewer ground-disturbing suppression activities.

Impacts to paleontological resources from lands and realty management would decrease, as compared to Alternative 1. Under Alternative 3, no lands would be available for disposal, and approximately 271,110 acres would be withdrawn from mineral location. Retaining all lands under federal jurisdiction would maintain protections associated with federal management policies. The withdrawal of 271,110 acres would result in closure of these areas to locatable mineral development and future disposal actions. This would provide additional protection to paleontological resources located in these areas by reducing surface disturbing and other disruptive activities and eliminate the possibility of placing undiscovered paleontological resources outside of federal jurisdiction.

Adverse impacts to paleontological resources from development activities associated with lands and realty actions would be greatly reduced under Alternative 3. Areas with important resource values would be closed to new wind energy development, utility/transportation systems, and communication sites (384,030 acres—Map 2-32). Closure of these areas would offer the greatest protection to paleontological resources from these types of surface disturbing activities. The area within 1/2 mile of the incorporated boundaries of cities and towns (4,500 total acres) would be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals. These restrictions would preclude surface disturbing and disruptive activities associated with minerals development and would indirectly protect paleontological resources in these areas.

Impacts to paleontological resources from livestock grazing management would decrease, as compared to Alternative 1. The emphasis on fence modification as opposed to new fence construction and emphasis on small-scale as opposed to large-scale water developments would result in the disturbance of 480 fewer acres over the planning period. The decrease in disturbed acres would decrease the potential for inadvertent damage to previously unknown resources. However, as a result, there would be fewer paleontological resource inventories, reducing the potential to increase the site database.

Impacts to paleontological resources from oil and gas development would be similar to those identified in Alternative 1, except that less acreage would be open to oil and gas leasing along with greater constraints from other programs. Areas closed to leasing or otherwise restricted from development, surface disturbing activities, or surface occupancy would be increased. Paleontological resources occurring in these areas would therefore be subjected to fewer impacts. Overall, approximately 8,632 wells would be drilled over the next 20 years, disturbing approximately 56,500 acres (including all related facilities and pipelines).

The decrease in disturbed acres would decrease the potential for inadvertent damage to previously unknown resources, as well as the potential for identification of paleontological resources. The decrease in development would decrease the potential for adverse impacts from unanticipated subsurface discoveries and trespass violations. However, fewer paleontological inventories and site mitigations (e.g., excavations) would be required, which serve to expand the paleontological resource database.

Impacts from paleontology management would provide additional protections to paleontological sites over Alternative 1. Development of interpretive facilities at select locations with high paleontological values and designation of hobby collection areas would provide information and education on the importance of preserving paleontological resources. This would potentially increase community awareness of these resources and reduce the potential for incidental or purposeful disturbance of paleontological resources. Monitoring surface disturbing activities within Class 4 and Class 5 fossil-bearing formations would ensure that adverse effects to paleontological resources from discovery or trespass situations would be minimized.

Impacts to paleontological resources from recreation management would be similar to Alternative 1, except developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/2-mile area (12,750 acres) would be subject to NSO stipulations. These actions would serve to reduce the potential for damage to paleontological resources in these areas by limiting the level of surface disturbing and other disruptive activities.

Those areas open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals would also preclude surface disturbing and disruptive activities that could potentially adversely affect paleontological resources. These restrictions would be included in the Shirley Mountains area (37,820 acres), Historic Trails area (66,370 acres), North Platte River area (12,740 acres), Jelm Mountain area (18,100 acres), Pedro Mountains area (18,650 acres), Laramie Plains Lakes area (1,600 acres), and Rawlins Fishing area (330 acres).

Impacts to paleontological resources from SD/MAs would be similar to those impacts identified in Alternative 1, except management of surface disturbing and disruptive activities within the SD/MAs would be more restrictive. Those areas closed to new oil and gas leasing and closed to locatable mineral entry and mineral material disposal would offer the greatest protection for paleontological resources because surface disturbing and disruptive activities associated with mineral development would not be allowed. These restrictions would be included in the Sand Hills ACEC and JO Ranch Expansion area (12,680 acres), Jep Canyon area (13,810 acres), Chain Lakes area (30,560 acres), Wick-Beumee area (280 acres), Cave Creek Cave area (520 acres), Laramie Plains Lakes area (1,600 acres), Upper Muddy Creek Watershed/Grizzly area (59,720 acres), and Cow Butte/Wild Cow area (49,570 acres) SD/MAs.

Those areas open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals would also preclude surface disturbing and disruptive activities that could potentially adversely affect paleontological resources. These restrictions would be included in the Como Bluff area (1,690 acres).

Those areas open to oil and gas leasing with intensive management of surface disturbing and disruptive activities would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect paleontological deposits located within the SD/MAs. This restriction would be included in the Shamrock Hills area (18,400 acres), Laramie Peak area (18,940 acres), Red Rim-Daley area (11,100 acres), Pennock Mountain area (7,770 acres), Blowout Penstemon area (17,050 acres), White-Tailed Prairie Dog areas (109,650 acres), High Savery Dam area (530 acres), and Continental Divide National Scenic Trail (600 acres) SD/MAs. These areas would also be closed to locatable mineral entry

and mineral material disposals which would preclude surface disturbing and disruptive activities that could potentially adversely affect paleontological resources.

Other restrictions associated with the SD/MAs would also provide additional protections to paleontological resources from surface disturbing activities not associated with minerals development. Surface disturbing activities would not be allowed within 1/4 mile of the Historic Trails. Surface disturbing and disruptive activities would be restricted or prohibited in aspen communities in the Upper Muddy Creek Watershed/Grizzly and Jep Canyon areas, in aspen and mountain shrub communities within the Cow Butte/Wild Cow area, and within 50 meters (164 feet) of prairie dog towns within the White-Tailed Prairie Dog SD/MA. In addition, no new fences would be allowed within the Cow Butte/Wild Cow area.

Where impacts from transportation and access to paleontological resources are identified, road densities would not be allowed to exceed levels that diminish or adversely impact these resources. This would reduce the disturbance to paleontological resources from road proliferation, and limit illicit activities in areas that are difficult to access.

Impacts from vegetation management actions on paleontological resources would be similar to those identified in Alternative 1, except that vegetation and weed treatments would be increased to 806,840 acres over the next 20 years. Inventory and mitigation procedures conducted in conjunction with vegetation treatments would protect paleontological resources from significant damage. Managing for DPC would reduce the potential for impacts to paleontological resources by enhancing specific plant communities that improve soil stability. However, management for DPC would potentially result in increased herbaceous cover, which would reduce the potential for locating previously unidentified paleontological resources. In addition, occupied habitat for threatened, endangered, proposed, and candidate species would be open to oil and gas leasing with an NSO stipulation. This would provide additional protection to paleontological resources in these areas by restricting surface disturbing activities that would potentially adversely affect paleontological resources.

Impacts to paleontological resources from water quality, watershed, and soils management would be similar to those identified in Alternative 1. However, prohibiting the surface discharge of produced water from CBNG activities in the Colorado River Basin would eliminate the potential for such discharges to expose and damage paleontological resources in stream channels. Under this alternative, water impoundments in the Muddy Creek Watershed (Map 2-20) that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. This management action would provide additional protection to paleontological resources located in these areas by limiting surface disturbance, inundation, and associated damage to undocumented resources from water impoundments.

Impacts to paleontological resources from wildlife and fisheries management would be similar to those impacts identified in Alternative 1, except that restrictions on surface disturbing and disruptive activities would increase in sensitive wildlife habitat areas. Well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence would not be allowed within 1/4 mile of active raptor nests; and surface disturbing and disruptive activities would be prohibited in identified crucial habitat for sensitive species, within 50 meters of identified white-tailed and black-tailed prairie dog towns, and within 1/4 mile of the perimeter of occupied greater sage-grouse and sharp-tailed grouse leks. In addition, high-profile structures would be prohibited within 1 mile of active greater sage-grouse and sharp-tailed grouse leks. These restrictions would offer the greatest protection for paleontological resources because surface disturbing and disruptive activities with the potential for disturbing or displacing paleontological resources would not be allowed.

No new fences would be allowed in big game migration corridors, and water developments for livestock and wild horse use would not be allowed in crucial winter range. Paleontological resources would be protected from disturbance and displacement caused by animal concentration and trailing in these areas. In addition, RCAs would be closed to new oil and gas leasing, which would also provide indirect protections to paleontological resources from disturbance associated with mineral developments.

Summary

Impacts to paleontological resources would be similar to those impacts identified in Alternative 1. However, fewer acres would be disturbed, potentially impacting fewer paleontological resources. It is anticipated that 92,719 acres would be disturbed as a result of lands and realty management, livestock management, and minerals management activities. This disturbance would potentially result in dislocation, damage, or destruction of paleontological resources that were not discovered prior to surface disturbance.

As a result of WSAs, SD/MAs, and NSO stipulations, 415,840 acres would be protected from surface disturbing and other disruptive activities. These management actions would provide the greatest indirect protection to paleontological resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. In addition, there would be more indirect protection to paleontological resources from the increase of restrictions included in management actions for other resource programs.

It is anticipated that adverse impacts to paleontological resources would occur, but with the proper application of mitigation measures impacts are expected to be minimal. As discussed in the analysis above, any surface disturbance has the potential to damage and/or destroy paleontological sites through unanticipated discoveries (i.e., paleontological resources discovered during ground-disturbing activities). Unanticipated discoveries result in the loss of some or occasionally all of the paleontological resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing activities would protect most paleontological resources from significant damage. Paleontological monitoring in Class 4 and Class 5 formations would reduce the potential for significant impacts resulting from discovery situations. Because disturbance of fewer surface acres is anticipated, the potential for significant impacts would decrease as compared to Alternative 1.

4.10.5 Impacts Under Alternative 4: Proposed Plan

Air quality, cultural resource management, forest management, socioeconomics, VRM, and wild horse management actions would have little or no impact on paleontological resources.

Impacts from locatable and minerals material management are anticipated to be similar to those in Alternative 1.

Impacts to paleontological resources from fire and fuels management; livestock grazing management; and water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Impacts to paleontological resources from lands and realty management would be similar to those identified in Alternative 1, except 46,690 fewer acres would be pursued for withdrawal. This would reduce the level of protection to paleontological resources by increasing the amount of land that would be available for locatable mineral development and increasing the potential for placing undiscovered paleontological resources outside of federal jurisdiction. Furthermore, an additional 14,780 acres would be precluded from disposal actions. This would further reduce the amount of land that could be removed from federal jurisdiction and therefore the number of paleontological resources that could be exempt from federal management policies. The area within 1/4 mile of the incorporated boundaries of cities and towns

(1,500 total acres) would be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals. These restrictions would preclude surface disturbing and disruptive activities associated with minerals development, and would indirectly protect paleontological resources in these areas.

Impacts to paleontological resources from oil and gas development would be similar to those identified in Alternative 1, except that less acreage would be open to oil and gas leasing with greater constraints from other programs. Areas closed to leasing or otherwise restricted from development, surface disturbing and other disruptive activities, or surface occupancy would be increased. Paleontological resources occurring in these areas would therefore be subjected to fewer impacts. Overall, approximately 8,822 wells would be drilled over the next 20 years, disturbing approximately 57,820 acres (including all related facilities and pipelines). The decrease in development would lower the potential for adverse impacts from unanticipated subsurface discoveries and trespass violations. However, fewer paleontological resource inventories and site mitigations (e.g., excavations) would be required, which serve to expand the paleontological database.

Impacts to paleontological resources from recreation management would be similar to those identified in Alternative 1, except developed and undeveloped recreation sites (9,660 acres) and the surrounding 1/4-mile area (7,930 acres) would be subject to NSO stipulations. Surface disturbing and other disruptive activities within the Adobe Town fringe areas (31,510 acres) would also be intensively managed. These actions would reduce the potential for damage to paleontological resources in these areas by limiting the level of surface disturbing and other disruptive activities.

Impacts to paleontological resources from management actions associated with the Shirley Mountain SRMA (37,820 acres), Continental Divide National Scenic Trail SRMA (600 acres), North Platte River SRMA (5,060 acres), Jelm Mountain SRMA (18,100 acres), Pedro Mountains SRMA (18,650 acres), Laramie Plains Lakes SRMA (1,600 acres), and the Rawlins Fishing SRMA (330 acres) would be the same as those identified in Alternative 3, except the Continental Divide National Scenic Trail SRMA, North Platte River SRMA, Jelm Mountain SRMA, and Pedro Mountains SRMA would not be closed to locatable mineral entry, which would increase the potential for adverse effects to paleontological resources in these areas by allowing for surface disturbing activities associated with locatable mineral development.

Impacts to paleontological resources from management actions associated with the Como Bluff NNL (1,690 acres), Sand Hills and JO Ranch Expansion ACEC (12,680 acres), Jep Canyon WHMA (13,810 acres), Shamrock Hills RCA (18,400 acres), Chain Lakes WHMA (30,560 acres), Laramie Peak WHMA (18,940 acres), Red Rim-Daley WHMA (11,100 acres), Pennock Mountain WHMA (7,770 acres), Wick-Beumee WHMA (280 acres), and the White-Tailed Prairie Dog area would be similar to Alternative 1, except that surface disturbing and disruptive activities would be avoided in aspen communities within the Jep Canyon WHMA, and intensively managed in the Chain Lakes WHMA. This would provide additional protection from adverse effects to paleontological resources in these areas by limiting the potential for discovery situations.

Impacts to paleontological resources from management actions associated with the Blowout Penstemon ACEC (17,050 acres), Upper Muddy Creek Watershed/Grizzly WHMA (59,720 acres), Cow Butte/Wild Cow WHMA (49,570 acres), and High Savery Dam area (530 acres) would be similar to those identified in Alternative 3, except the Blowout Penstemon ACEC, Upper Muddy Creek Watershed/Grizzly WHMA, and Cow Butte/Wild Cow WHMA would not be closed to locatable mineral entry, which would increase the potential for adverse effects to paleontological resources in these areas by allowing for surface disturbing activities associated with locatable mineral development. Furthermore, surface disturbing and disruptive activities would be avoided in aspen communities and near riparian and wetland areas within

the Upper Muddy Creek Watershed/Grizzly WHMA, and avoided in aspen and mountain shrub communities within the Cow Butte/Wild Cow WHMA. This would provide additional protection from adverse effects to paleontological resources in these areas by limiting the potential for discovery situations.

Impacts to paleontological resources from vegetation management would be similar to those impacts identified in Alternative 3, except that vegetation and weed treatments would be increased to include 828,460 acres over the next 20 years. Inventory and mitigation procedures conducted in conjunction with vegetation treatments would protect sensitive paleontological resources from significant damage.

Impacts to paleontological resources from wildlife and fisheries management would be similar to those impacts identified in Alternative 1, except that surface disturbing and disruptive activities would be prohibited within 1/4 mile of the perimeter of occupied greater sage-grouse and sharp-tailed grouse leks. Paleontological resources in these areas would be protected from activities with the potential for disturbing or displacing cultural resources.

Summary

Impacts to paleontological resources would be similar to those impacts identified in Alternative 1. However, fewer acres would be disturbed, potentially impacting fewer paleontological resources. It is anticipated that 87,583 acres would be disturbed as a result of lands and realty management, and minerals management activities. This disturbance would potentially result in dislocation, damage, or destruction of paleontological resources that were not discovered prior to surface disturbance.

As a result of WSAs, SD/MAs, and NSO stipulations, 336,700 acres would be protected from surface disturbing and other disruptive activities. These management actions would provide the greatest indirect protection to paleontological resources by eliminating the potential for surface disturbing and other disruptive activities in these areas. In addition, there would be more indirect protection to paleontological resources from the increase of restrictions included in management actions for other resource programs.

It is anticipated that adverse impacts to paleontological resources would occur, but with the proper application of mitigation measures impacts are expected to be minimal. As discussed in the analysis above, any surface disturbance has the potential to damage and/or destroy paleontological sites through unanticipated discoveries (i.e., paleontological resources discovered during ground-disturbing activities). Unanticipated discoveries result in the loss of some or occasionally all of the paleontological resource involved. Standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most paleontological resources from significant damage. Paleontological monitoring in sensitive areas would reduce the potential for significant impacts resulting from discovery situations. Because disturbance of fewer surface acres is anticipated, the potential for significant impacts would decrease compared to Alternative 1.

4.11 RECREATION AND VISITOR SERVICES

This section presents potential impacts to recreation and visitor services from other management actions. Recreational uses on public lands administered by BLM within the RMPPA include hunting, fishing, floating, camping, hiking, rock climbing, horseback riding, OHV use, rock hounding, photography, wildlife viewing, and antler gathering. Existing conditions concerning recreation resources are described in Section 3.11.

OHV management is discussed in Section 4.9 of this document; however, based on the level of recreational OHV use in the RMPPA, some references to OHV use have been included in this section. For specific impacts to OHV use, refer to Section 4.9.

Significance Criteria

Impacts to recreation would be considered significant if any of the following were to occur:

- Management actions result in long-term elimination or reduction of recreation use in any area or compromise public health and safety.
- Intensity of development is incompatible with the stated objectives of SRMAs.
- Increases in recreational activity create substantial risks to public health and safety or resource damage.

Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of resources and the RMPPA and review of existing literature. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- Traditional recreational uses within the RMPPA will continue, and an anticipated increase will occur in fishing, floating, camping, OHV use, and new technology-based recreation activities. Based on Wyoming Game and Fish data, hunting is expected to gradually decrease.
- The incidence of resource damage and conflicts between recreationists involved in motorized and nonmotorized activities will increase with increasing use of public lands.
- Proliferation of unauthorized trails and the associated resource degradation will continue to occur in spite of BLM efforts at prevention and education.
- All restrictions apply to casual use, but not necessarily to all permitted activities.
- In some areas where resources have been damaged by recreational activities, sites would be closed and reclaimed.
- RFDs and RFAs can be found in Appendix 33.

4.11.1 Impacts Common to All Alternatives

Management actions for cultural resources would require the relocation of potential recreational facilities in areas where the integrity of the setting contributes to NRHP eligibility. Such actions would minimally impact recreation opportunities by moving facilities or rerouting access, displacing recreationists to other potentially less desirable areas.

Short-term impacts to recreation from wildland fire and fuels management would result in temporary closure of areas during and after fire events, which would displace recreationists to other areas. Long-term impacts would result in displacement of some recreationists because of the altered recreational setting, but they would also create new recreational opportunities and experiences. Developed recreational sites have been identified for special protections and included in the specific fire management plans, which would maintain the recreational settings and activities.

Forest management actions would benefit recreation by allowing harvests of minor wood products to maintain or enhance forest health. This would provide recreational opportunities such as fuel wood gathering and improve the recreational settings by enhancing scenic qualities and other supplemental values. Temporary recreation displacement would occur during commercial harvest activities because of an alteration of recreation settings, such as increased traffic, dust, noise, and loss of solitude.

Lands and realty management actions to consider acquisition of nonfederal lands would potentially improve public access in areas with intermingled land ownership and facilitate increased or improved access to recreation resources such as WSAs and river access points. Some 935,530 acres of existing withdrawals would be closed to public land laws and to locatable mineral entry, which would protect and maintain recreational resources. Other lands and realty management actions would result in surface disturbance which would alter the recreational settings and influence recreational activities, potentially displacing recreationists to alternative areas.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Areas with important resources, such as existing and proposed recreation sites and SD/MAs that contain important supplemental recreational values, would be avoided to reduce the impacts of these types of developments where possible. Developments would alter the typical middle country recreational settings in the RMPPA by creating contrasting elements to the existing settings that would alter recreational opportunity and activities in the area.

Livestock management actions would help achieve the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which would enhance recreation opportunities by maintaining the setting, opportunities, and experiences. In many cases, promoting shorter duration of livestock use and manipulating the season of use would incorporate timing of recreation in order to reduce the effects of livestock grazing upon the recreational experience. The presence of livestock in a landscape setting is probably not detrimental to the experience of most recreationists. On a site-specific level, however, recreationists would potentially be displaced in response to water quality issues and the presence of livestock. In some cases when livestock use is high, bacteria such as Escherichia coli would impact the recreational experiences and activities for portions of the year. The proximity to livestock and concern over their behavior would influence recreationists' safety or purpose for being. This would result in a less enjoyable experience and would potentially displace recreationists to other locations or another time of year when livestock are not present.

Minerals management actions would open up previously limited areas to recreational use. Travel off existing roads for "necessary tasks" associated with minerals management and other programs could

potentially generate new primitive routes. Such new routes would create new access opportunities for recreationists, but would also affect the recreational setting. Hazards associated with road use would be proportional to the amount of mineral activity plus the historical recreational use.

In areas with moderate to high oil and gas potential (Map 4-7), development activity would further alter supplemental values important for recreation such as scenic quality and natural, social, and administrative settings. The industrialized character associated with oil and gas activity will introduce new contrasting elements affecting the scenic quality which would displace some recreationists to other areas. The back country to middle country settings would be changed to an industrialized landscape setting that would interfere with recreationists' goals and experiences. The change would also displace them to other areas. Short- term effects to recreation from increased oil and gas development would be improved access to areas otherwise unreachable and expanded recreational opportunities. However, in the long term, supplemental values and resources such as scenic quality, solitude, and wildlife would be degraded and would interfere with recreationists' goals and experiences.

Locatable mineral exploration and mineral material disposals would have the potential to impact recreational resources. Mitigation measures would minimize the impacts to recreation resources resulting from surface disturbing activities. Reasonably foreseeable development activities for locatable minerals would not affect significant acreage. Mineral material permits are discretionary. If impacts to resources are identified, the impacts would either be mitigated or the permit denied. Therefore, there would be little or no effect on recreation resources.

OHV management would provide recreational opportunities and activities as well as protect and mitigate resource damaged and resolve conflicts caused by OHV use. Some direct, short-term effects from OHV use would be noise and decreased air quality, which would diminish the recreational experience for other recreationists who seek solitude and natural settings for camping, hiking, and related nonmotorized recreational activities. Congestion in popular recreation areas and conflicts between various recreationists, such as motorized and nonmotorized users, would detract from the quality of the recreational experience. OHV management will allow OHV use for "necessary tasks" and for over-the-snow activities. Such things, however, could result in conflicts between users, promotion of primitive route proliferation, and affect the recreational setting. OHV use would provide additional recreational opportunities and activities such as driving for pleasure, wildlife viewing, self achievement, and accessing remote areas.

Paleontological discoveries would potentially be protected by actions such as fencing, signing, physical barriers, or other methods of restricting access. Acreage within these areas would be minimal and therefore would have a negligible impact on recreation use.

The recreation program provides opportunities for outdoor recreation activities at both developed sites and dispersed areas. Recreation attractions would be managed to provide for visitor health and safety, coordinate with other programs to minimize conflicts and adverse impacts on recreation opportunities, protect resources, and enhance recreation. Short-term impacts from recreation management actions would preserve or increase visitor satisfaction because of the quality of settings, opportunities, and experiences. Long-term impacts would be sustained recreation activity, which is recognized as a renewable commodity for the RMPPA.

SRMAs are designated to protect and enhance specific recreation opportunities and maintain dispersed recreation such as hiking, camping, hunting, sightseeing, and wildlife viewing. Shirley Mountain SRMA would be managed to maintain or enhance dispersed primitive camping and to improve travel management to facilitate public access. Management of Cave Creek Cave within the SRMA would provide and maintain a unique recreational caving opportunity while protecting the resources. The Continental Divide National Scenic Trail management actions would provide recreationists the

opportunity to experience a segment of the 3,100-mile trail extending from Canada to Mexico while providing access to areas otherwise unavailable for recreational activities. Management actions of the North Platte River SRMA, recognized for the exceptional fishing and river-related opportunities, would maintain river access and recreational opportunities and experiences. OHV SRMA management actions would include educational programs that would provide for responsible motorized recreational activities. Management actions of Jelm Mountain SRMA would maintain or enhance the natural resources and settings thereby benefiting the recreational settings and supplemental values such as scenic qualities and solitude. Pedro Mountains SRMAs would be managed to enhance opportunities for rock climbing, as well as to protect the back country to middle country recreational settings by preserving the scenic quality and primitive recreational experiences. Management actions for the Laramie Plains Lakes and the Rawlins Fishing SRMAs would allow for continued availability of water-related activities, which would diversify the recreational opportunities for the local communities.

The special protections and enhancements associated with SD/MAs often enhance recreation settings and experiences, but would potentially restrict recreational management activities and dispersed recreational uses. WSAs and WSRs, managed to preserve wilderness character, consist of settings for users seeking primitive recreational opportunities. Such opportunities, however, would preclude and displace users seeking motorized activities.

Transportation and access management actions would maintain an adequate road network for public health and safety. In addition, the actions would facilitate recreational access through intermingled land ownership patterns, which would maintain recreational opportunities, activities, and experiences.

Vegetation management actions would use all forms of control for noxious and invasive species on a case-by-case basis and would manage riparian, wetland, and upland vegetation. Short-term impacts would be visitor displacement resulting from temporary closures of areas undergoing vegetation treatments. Long-term impacts to recreation, overall, would maintain or improve the recreational settings, opportunities, and activities.

Visual resource management actions would maintain the overall integrity of the scenic qualities while allowing for development of existing and future uses. These designations would limit visual impacts associated with management actions in VRM Class I and Class II areas, whereas VRM Class III and Class IV would allow much more modification of the natural environment. Strict mitigation associated with VRM Class I and Class II would prevent projects from contrasting with the existing elements, which would retain or improve the recreational settings. Mitigation associated with VRM Class III and Class IV would allow more scenic contrasts, which would detract from the recreational setting (Appendix 2-25). Altering the recreational setting would influence recreational activities, which would displace some recreationists seeking back country to middle country recreation settings.

Water quality, watershed, and soils management actions such as avoidance, mitigation, or application of BMPs (Appendix 13) would protect water sources for campground facilities and would enhance recreational opportunities by providing potable water. Water and watershed management activities indirectly protect existing flow conditions that affect recreational opportunities and river-related activities.

Management actions to protect sensitive soils would preclude development of recreational campgrounds in specific areas, but would maintain or enhance the recreational settings and supplemental values. Overall, impacts to recreation would be negligible.

Wild horses management actions would protect, maintain, and control viable, healthy herds while retaining their free-roaming nature and provide opportunities for public viewing of wild horses. These

actions would maintain a quality recreation setting and provide for unique supplemental values, opportunities, and experiences.

Fish and wildlife management decisions affect the habitat, health, and population of fish and wildlife species. Many recreation activities such as hunting, wildlife viewing, bird watching, and fishing are dependent upon the presence of healthy and abundant wildlife habitats and populations. Wildlife actions that maintain or improve wildlife habitat would affect the natural integrity of the recreational setting, which would influence activities and opportunities. Management of wildlife habitat would allow surface disturbing and disruptive activities to occur. Spatial and temporal restrictions, as well as requiring BMPs, would be implemented to protect or improve wildlife and associated habitat. It should be noted that management actions that would alter recreational activities would temporarily displace wildlife.

4.11.2 Impacts Under Alternative 1: Continuation of Existing Management

Management actions for cultural resources would require the relocation of potential recreational facilities in areas where the integrity of the setting contributes to NRHP eligibility. Such actions would minimally impact recreation opportunities by moving facilities or rerouting access, displacing recreationists to other potentially less desirable areas. Protection of cultural sites would increase their potential as a recreational destination, which would offer more opportunities and activities. Overall, little or no impacts to recreation would be anticipated.

Wildland fire management actions would allow wildland fire to play its natural role and would be used for resource benefit when appropriate. Short-term localized impacts to recreation from wildland fire and fuels management would result in temporary closure of areas during and after fire events, which would displace recreationists to other areas. However, with an average of 4,000 acres burned by wildland fire per year, impacts to recreational resources, settings, opportunities, and experiences would be minimal. Long-term impacts would result in displacement of some recreationists because of the altered recreational setting, but they would also create new recreational opportunities and experiences.

Forest management would use a full range of methods to improve forest health. Timber harvesting activities (28,500 acres would be available for commercial timber harvest on Shirley Mountain) would temporarily displace recreationists because of an alteration of recreation settings, such as increased traffic, dust, noise, and loss of solitude; these activities would also cause a loss of recreational opportunities during logging operations. Timber harvesting would alter recreational settings, which would influence recreational opportunities and experiences. In the long term, closed logging roads would provide non-motorized access into areas that would provide additional recreational opportunities, activities, and experiences.

Acquisitions and land tenure adjustments through exchange would facilitate greater recreational access and reduce conflicts between recreationists and landowners. Other lands and realty management actions would result in surface disturbance that would alter the recreational settings and influence recreational activities, potentially displacing recreationists to alternative areas. This action, combined with continued protection of existing recreation resources through the establishment of ROW avoidance areas and exclusion areas, could result in an increase in available recreational opportunities.

Proposed closure of about 63,670 acres to operation of the public land laws, including disposal, and to mineral location under the mining laws would be pursued. These closures would provide additional protection to recreational resources and would maintain or enhance recreational settings, opportunities, and experiences. Impacts to recreational resources from disposal actions would be negligible.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Areas with important resources, such as existing and proposed recreation sites and SD/MAs that contain important supplemental recreational values, would be avoided to reduce the impacts of these types of developments where possible (Map 2-30). These facilities would still potentially affect recreational settings within avoidance areas because of the height and size of the facilities, the noise they make, and the visual intrusion that is visible from great distances. Developments of this size would alter the typical middle country recreational settings in the RMPPA by creating elements that contrast with the existing settings thereby altering recreational opportunity and activities in the area.

In addition to impacts described in the Common to All section, livestock management actions would create new roads (for access to range improvements) and help maintain existing roads and vehicle routes, which would improve recreational access to some areas. New fences would have an adequate number and location of gates to meet the needs of livestock management and other resource values including recreation management. In some instances gates would not be placed on every existing road crossing. They would not be located, for example, where recreation management or another program would benefit from a road or trail closure protecting or enhancing resource values. Construction of larger reservoirs capable of creating new fishery resources would increase the number of sites for recreational fishing. The result would be wider distribution of this use and potentially more favorable experiences from such sites. Conversions from cattle or sheep to domestic bison would increase safety concerns on the part of recreationists because of potential confrontations with bison. However, this is a discretionary action authorized by the field manager and effects on other resource values would be taken into account prior to approval.

Mineral development in areas of high and moderate oil and gas potential (where most development is anticipated) is expected to add 8,945 new wells with a gross disturbance of 61,895 acres during the life of the plan. The additional oil and gas facilities, equipment, noise, dust, vehicles, night lighting, pipelines, and human activity would alter the recreational setting to an industrial setting, which would influence recreationists' goals, opportunities, activities, and experiences. This change in the nature of the setting would potentially displace recreationists. It would not only be a significant impact to recreation through loss of opportunities in the industrialized areas, but it would also lead to an increase in visitors in areas with traditional recreational settings where the recreationists go to experience alternate opportunities and experiences. The increase in the visitor concentration in alternate recreational settings would potentially detract from the quality of recreational experiences in those areas, especially for those seeking solitude. Under this alternative, 185,130 acres would be available for lease under stipulations such as NSO, 65,600 acres would be closed to leasing, and 63,670 acres would be withdrawn from locatable mineral entry, each of which would protect specific recreation settings from the significant impacts discussed in the Impacts Common to All section. Development management actions would result in long-term reduction of recreation use in these areas, which constitutes a significant impact to recreation.

Locatable mineral exploration and mineral material disposals would have the potential to impact recreational resources. Mitigation measures would minimize the impacts to recreation resources caused by surface disturbing activities. Reasonably foreseeable development activities for locatable minerals would not affect significant acreage. Mineral material permits are discretionary. If impacts to resources are identified, the impacts would either be mitigated or the permit denied. Therefore, there would be little or no effect on recreation resources.

OHV management actions allow for open OHV use in the nonvegetated sand areas in the Dune Ponds Cooperative Management Area (3,730 acres), the remainder of the RMPPA would be managed as limited to existing roads and vehicle routes (1,284,490 acres), or limited to designated or existing roads and vehicle routes (2,222,330 acres). An increase in route proliferation from offroad OHV use to retrieve big

game, access campsites, or complete "necessary tasks" would affect the recreational setting and experience for recreationists desiring natural settings. The seasonal restrictions and areas closed to OHV use would maintain or enhance the natural recreational values and settings preferred by recreationists seeking a primitive recreational experience.

Recreation resource management actions would create an NSO stipulation within recreation sites. Surface disturbance would be intensively managed within the 1/4 mile surrounding these sites in an attempt to locate development activities far enough away to preserve the recreation setting and experience at the sites. Developed recreation sites would also be closed to locatable mineral entry, mineral material disposals, and operation of the public land laws, all of which would further preserve the integrity of the sites and the quality of the recreation experience.

The Shirley Mountain area management actions would retain the SRMA designation, thus allowing a continued recreation management focus on the area. Management actions will also open oil and gas leasing with intensive management of surface disturbing and disruptive activities, which would decrease the potential for altering the recreational settings and experiences.

The North Platte River SRMA would be open to oil and gas leasing with intensive management of surface disturbance. Development activities would potentially impact the recreational experience along the river corridor with noise, fugitive dust, odors, visual intrusions, and industrial traffic. The SRMA would also be open to locatable mineral entry and mineral material disposals with restrictions to maintain the visual resource that would minimize the visual affects created by new vehicle routes, fugitive dust, and noise that would detract from the quality of the recreation experience in localized areas.

Jelm Mountain, the Pedro Mountains, the Rawlins Fishing sites, and the Laramie Plains Lakes would not become SRMAs. These areas would be open to oil and gas leasing, locatable mineral entry, mineral material disposals, and the operation of the public land laws. While mineral development would not necessarily reduce the visitation to these areas, these actions would alter the recreational settings, experiences, and supplemental values by the development actions associated with industrial settings.

The Como Bluff area (1,690 acres), Sand Hills ACEC (7,960 acres), Jep Canyon area (13,810 acres), Stratton Sagebrush Steppe Research Area Potential ACEC (5,530 acres), Chain Lakes area (30,560 acres), Laramie Peak WHMA (18,940 acres), Wick-Beumee area (280 acres), Cave Creek Cave area (240 acres), Laramie Plains Lakes area (1,600 acres), Historic Trails area (66,370 acres), Upper Muddy Creek Watershed/Grizzly area (16,340 acres), and Cow Butte/Wild Cow area (49,570 acres) would require intensive management of surface disturbing and other disruptive activities. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to alter the recreational settings and experiences.

SD/MA management actions would not designate the Blowout Penstemon area as an ACEC, and would also be open to locatable mineral entry and mineral material disposals. These actions would affect the recreational resources and potentially alter the recreational settings, which would influence recreational activities. These impacts would potentially displace recreationists to alternative areas. However, management actions would also actively pursue land tenure adjustments, including acquisition of lands, easements, or exchanges. These actions would potentially improve recreational settings and opportunities by minimizing conflicts within mixed surface ownership lands.

High Savery Dam and Reservoir area management actions would allow development of a recreational fishery and close the area to OHV use. These actions would preserve the recreational settings by preventing proliferation of primitive trails, and enhance recreational opportunities and experiences, which would diversify the recreational opportunities for the local communities.

The Cave Creek Cave ACEC would not be created and management actions would allow timber harvesting and open public lands to operation of public land laws, including sale, locatable mineral entry, and mineral material disposals. These actions would potentially endanger cave resources and would potentially affect its desirability as a destination for recreational caving (Cave Creek Cave Potential ACEC). Management actions allowing oil and gas leasing with intensive management of surface disturbing and disruptive activities would decrease the potential of altering the cave resources, which would help maintain the recreational activities and experiences.

The 140 miles of segments deemed eligible for inclusion in the Wild and Scenic River System would be protected from new human intrusions to maintain their free-flowing nature, outstandingly remarkable values, and tentative classifications until suitability determinations are made. This action would preserve the recreational settings and would maintain or enhance the primitive recreational experiences and opportunities these segments provide.

Transportation and access management would potentially acquire new legal public access to areas that would offer new recreational opportunities on public lands. With more alternative opportunities, over-concentration of visitation in the more popular areas would be less likely.

Road densities would not be considered during the analysis process of surface disturbing and disruptive activities. This course would potentially be detrimental to recreation opportunities by allowing road proliferation to fragment habitat, create linear visual intrusions, bring about increased noise and dust associated with traffic, and generally alter the natural character of an area.

Short-term impacts from vegetation treatments would temporarily displace recreationists from treated areas to other areas. The long-term effects would be to enhance the recreational setting and experience by improving the vegetation health and wildlife habitat.

Visual resource management classifications determine the allowable level of visual impact in specific areas while maintaining the effectiveness of land use allocations for activities based on other resources. Limitations on visual intrusions to protect the visual quality of Class I and Class II VRM areas retain or improve the naturalness of recreational settings. Class III and Class IV would allow for more visual intrusions and modifications to landscapes, which would alter the landscapes from natural settings to industrial settings. Areas prescribed with VRM Class III and Class IV would alter the recreational settings, which would displace users seeking more natural landscapes. The checkerboard land pattern along the original Union Pacific Railroad (U.P.R.R.) ROW is not conducive to VRM Class II because BLM has no control over adjacent private surface where development would potentially impair visual qualities. Recreation opportunities are limited in the checkerboard and other intermingled land patterns such as the Shirley Mountains. Thus a change from VRM Class II to Class III would have minimal impact on recreation settings or opportunities in these areas.

Impacts from water quality, watershed, and soils management will be similar to those noted in the Common to All section, except for the action authorizing surface discharge of produced water from oil and gas development. Surface discharging produced waters would change the physical hydrology of receiving waters, impact water quality, and would possibly create additional temporary water sources or evaporation/infiltration reservoirs that would require reclamation upon project completion. Changes in water quality in recreational fisheries would alter aquatic habitats and would potentially be detrimental to fishing resources. The surface discharge of produced waters would potentially create new waterbodies that support recreational fisheries. These fishery resources would be available for proximately 15 years as produced waters are available.

Impacts from wildlife management actions would be similar to those listed in the Common to All Alternative; however, spatial and temporal stipulations would be implemented to protect wildlife during sensitive time periods. These restrictions would affect recreational implementation of proposed projects and activities such as developed campgrounds and organized events. These stipulations would have minimal impacts to recreation management. However, these restrictions in addition to NSO stipulations would protect most species and their associated habitats, which would maintain recreational settings, opportunities, and experiences.

Fisheries actions would maintain or improve fisheries in the RMPPA, which would maintain or enhance the quality of recreational fishing opportunities and experiences.

Summary

Surface disturbance, route proliferation, noise, fugitive dust, visual intrusions, and traffic associated primarily with oil and gas development would reduce the acreage and alter the quality of recreational opportunities available in the western RMPPA. The changed landscape would alter recreationists' opportunities and potentially displace recreational use from industrialized areas to alternative areas containing the desired setting. This would be a significant impact because it would eliminate recreational use and opportunities in a large area in the long term.

Promoting shorter duration of livestock use and manipulating the season of use would incorporate timing recreation to reduce conflicts between livestock and the recreating public. However, the presence of livestock in some rangeland locations would cause recreationists to have a less enjoyable experience or be displaced to another location or time of year.

4.11.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on recreation resources from cultural resources, livestock management, OHV management, paleontology, recreation resources, SD/MAs, water quality, watershed and soils management, and wild horse management would be the same as those identified in Alternative 1.

Fire and fuels management impacts to recreation resources would be the same as Alternative 1, except 2,000 acres per year would be burned.

Impacts from forest management would be similar to those in Alternative 1, except that clear cut sizes will be increased from 10 acres to 100 acres and select cut sizes would increase from 20 acres to 200 acres. In the short term, this increase in acreage size would notably alter recreational settings and opportunities, which would result in greater displacement to alternative areas. Long-term improvements in forest health would enhance the recreational settings and supplemental values.

Impacts from lands and realty management action would be similar to those identified in Alternative 1, except that wind energy, utility/transportation, and communication site avoidance areas would not cover as much acreage as in Alternative 1 (Map 2-31 and Table 2-5) and ROW corridors would potentially be created through the avoidance areas. Popular recreation destinations open to these types of developments would be affected by altered settings and values, which would influence recreational settings, opportunities, and activities. The impacts to recreational resources from locatable and mineral material activities would be the same as those identified in Alternative 1.

The impacts from management of leaseable minerals would be similar to those of Alternative 1, except that the impacts from oil and gas development activity would increase because 92,950 fewer acres would

have stipulations, such as NSO, and more than 500,000 additional acres would be open to leasing. This would potentially alter recreational opportunities in the RMPPA. The reduction in stipulations on 92,950 acres would affect supplemental values important for recreational opportunities and experiences. Minerals management actions would result in long-term reduction of recreation use in these areas, which would be a significant impact to recreation.

The Stratton Sagebrush Steppe Research Area would be open to oil and gas leasing and would require management plans from operators and mitigation to protect the research area. Development activities would alter the recreational setting from a natural landscape to a more industrialized landscape, which would influence recreational goals and experiences, potentially displacing users to alternative areas.

Cave Creek Cave resources would be protected from locatable mineral entry and mineral material disposals as well as timber harvesting, all of which would help ensure the integrity of these recreational caving resources.

The North Platte River would not be managed as an SRMA to provide high-quality recreational opportunities along the river corridor. Only standard mitigation measures would be used to manage surface disturbing activities on BLM lands within 1/4 mile of the river. This would potentially detract from the quality of the river recreation experience with noise, dust, traffic, and other impacts associated with surface disturbance.

OHV SRMAs would be considered for development in the future if the need is identified. Recreation management would benefit from these SRMAs because the public would gain opportunities in areas selected specifically for OHV use, including educational opportunities for learning riding ethics and regulations. Offroad OHV use in areas limited to existing or designated roads and vehicle routes would potentially decline, which would maintain or improve the quality of the recreation experience outside the SRMAs.

All eligible waterway segments would be determined to be nonsuitable for inclusion in the National Wild and Scenic Rivers System. All segments would be released from further consideration for WSR. No special protections would be afforded to these segments. This would potentially impact recreation by allowing other management actions to reduce the quality of recreation settings along these waterways.

Transportation and access management would acquire legal access only when opportunities arise rather than actively pursuing such access. This course would reduce the potential for expanding recreational opportunities into areas where BLM lands have no legal public access.

Impacts to recreation resources from vegetation management actions would be the same as those described in Alternative 1, except there would be a tenfold increase in the amount of acres treated.

Reclassification of VRM class designations would reduce the acreage of VRM Class II around Pathfinder and Seminoe Reservoirs and eliminate VRM Class II in the Shirley Mountains and in areas with intermingled land ownership patterns such as the checkerboard. The total reduction in VRM Class II acreage under this alternative would be 125,660 acres. Changing the checkerboard to VRM Class III would have minimal effect on recreationists, because most of these areas do not have legal public access. The areas around Pathfinder Reservoir that would become Class III do not have legal public access by road or are not readily visible from the reservoir. The Shirley Mountains are managed for forestry as well as recreation, and logging on private lands has altered the scenic quality of the visual resources in the Shirley Mountains. VRM Class IV acreage would be increased by 224,150 acres, primarily in areas already visually impacted by development. The increase in Class IV management would allow for greater

change in the landscape setting to a more industrial setting, which would affect the recreational setting and experience.

Impacts from wildlife and fisheries management actions would be similar to those identified under Alternative 1, except spatial and temporal protective measures are greatly reduced thus increasing opportunities for recreational management projects. However, these actions would reduce protection for most species and associated habitats, which would alter recreational settings and opportunities.

Summary

Because of the decrease in protective measures, this alternative would result in the greatest reduction of fish and wildlife habitat. It would alter the fish and wildlife-related recreational settings, opportunities, and experience in developed areas, which would displace recreationists to alternative areas.

The loss of natural recreational settings would displace those recreationists seeking a natural landscape setting from oil and gas development areas to a much greater degree than any of the other alternatives. This would be a significant impact because it would eliminate recreational use in a large area in the long term.

4.11.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Cultural impacts would be similar to those of Alternative 1.

Fire and fuels management impacts to recreation resources would be the same as Alternative 1, except 10,000 acres per year would be burned.

Forest management actions would be similar to Alternative 1. However, commercial timber harvest would not be permitted, which would limit conflicts between those involved in harvesting activities and recreationists and allow for a more primitive recreational experience. Improved forest health would benefit the recreational settings and supplemental values, which in turn would influence overall recreational opportunities. As the forest declines in health, detrimental impacts to huntable wildlife populations could result, which would negatively impact the recreational experiences in the SRMA. Declining forest health would also negatively impact visual resources, further negatively impacting the value and the settings of the SRMA.

This alternative would provide the most protection to recreation resources, primarily because withdrawal areas from locatable mineral entry, mineral material disposals, and operation of public land laws would include recreation sites, historic sites, and habitat management areas (Table 2-2). Withdrawals in these areas would facilitate protection of resources that are important to recreation settings, opportunities, activities, and values. Exchange for nonfederal lands in SD/MAs would be considered to enable land consolidation within these areas.

Lands and realty management actions would close areas with important resource values to new energy development facilities and placement routes (Map 2-32 and Table 2-5). Communication sites would be co-located and limit new cell towers or communication sites to existing, designated communication sites. These actions would preserve the scenic qualities and recreational settings.

Impacts from livestock grazing management actions would be similar to those under Alternative 1, except grazing systems and range improvements would be implemented to enhance wildlife, watershed, and riparian values. These systems and improvements would improve water quality and wildlife habitat,

which would improve recreational settings. Conversions from cattle or sheep to domestic bison would not occur in areas of blocked federal surface land ownership, which would reduce safety concerns of recreationists over potential confrontations with bison.

The impacts from locatable and mineral material management to recreational resources would be the same as Alternative 1. The impacts from oil and gas development would be similar to those identified under Alternative 1, except that the impacts would be reduced by NSO restrictions, closures to leasing, and closures to locatable mineral entry. These protections would maintain the recreational settings, opportunities, and experiences.

OHV management actions that prohibit offroad travel for dispersed camping and big game retrieval would protect the recreation setting from route proliferation, but such actions would also affect the accessibility to and opportunity for primitive camping and big game retrieval for some recreationists. Closure of the Dune Ponds Cooperative Management Area (3,730 acres) would eliminate the only open OHV area in the RMPPA. Because of the small size of the open area, this is not expected to be a significant reduction in recreation opportunities in the region.

Paleontology management actions would designate hobby fossil collection areas and develop paleontological interpretive facilities, which would provide new recreation opportunities and activities in the RMPPA.

Recreation management actions would open recreation sites and a 1/2-mile area surrounding the sites to oil and gas leasing with an NSO stipulation but would close such sites to locatable mineral entry, mineral material disposal, and operation of public land. These actions would preserve the quality of their recreational settings, opportunities, and experiences. Adobe Town Dispersed Recreation Use Area (Map 2-16) would be a priority area for reclamation so as to maintain the near primitive recreational settings and experiences.

The Shirley Mountain SRMA would be expanded to include 13,380 additional acres. This action would benefit recreation by assuring or improving recreation opportunities in the Shirley Mountains.

The North Platte River SRMA would have a wider corridor (1/2 mile on either side of the river) in this alternative. The corridor would be closed to locatable mineral entry, mineral material disposal, and the operation of the public land laws, including sale. Withdrawals would be pursued. This would reduce the possibility of development adjacent to the river impacting the river recreation experience and visual resources.

Jelm Mountain, the Pedro Mountains, the Rawlins Fishing sites (Teton Reservoir and Rim Lake recreation sites), and the Laramie Plains Lakes (Lake Hattie Reservoir and Twin Buttes Lake) would be managed as SRMAs. These SRMAs would have NSO stipulations on new oil and gas leases, intensive management of existing oil and gas leases, and would be closed to locatable mineral entry, mineral material disposal, and land tenure adjustments resulting in a loss of public access. This would allow an elevated level of recreation management for these areas to preserve or improve the quality of recreation opportunities available in the RMPPA.

Several more SD/MAs would be managed as ACECs under this alternative. The additional management actions in ACECs would improve habitat quality and therefore the recreational setting for most activities. Most SD/MA actions would also benefit recreation opportunities because of the additional surface disturbance restrictions; closures to new leasing, locatable mineral entry, and mineral material disposal; withdrawals from mineral development; and active pursuits of land tenure adjustments. Offroad travel for “necessary tasks,” big game retrieval, and campsite access would be prohibited and many of the SD/MAs

would have seasonal OHV closures. These actions would reduce the probability of route proliferation and user conflicts and result in the long-term enhancement of recreational opportunities in the RMPPA. These actions would also potentially influence recreation projects such as campsite design and placement, and influence decisions to authorize special recreation permits.

The closure of all 5 WSAs to motor vehicles would maintain the scenic qualities and the natural settings, which would preserve the wilderness suitability of these areas. While such a closure would remove an additional 45,840 acres of land from motorized access, fewer than 5 miles of legal existing routes would be affected—not a significant loss of OHV opportunities. These closures would result in a total of 67,720 acres (all of which are already WSAs) available for non-motorized primitive and unconfined recreation.

The JO Ranch expansion area (4,740 acres) would be added to the Sand Hills ACEC and managed to protect the historical and cultural values of the ranch and create an historic area interpretive site. This would maintain and enhance recreational and educational opportunities. Designating the 2-mile or visual horizon area around the JO Ranch as a VRM Class II would maintain the historic setting which would maintain the recreational setting. Stabilizing the buildings within the interpretive area would provide a safe recreational environment.

The Blowout Penstemon ACEC would be managed to protect the endangered plant and its associated habitat. OHV use would be limited to designated roads and vehicle routes and would not allow off-road OHV use for “necessary tasks,” big game retrieval, and campsite access. These actions would maintain or enhance the recreational settings and experiences. However, they would also alter or preclude other recreational activities, which would displace some recreationists to alternative areas.

The Cave Creek Cave (within the Shirley Mountain SRMA) would be managed as an ACEC (520 acres) to protect cave resources. This action would benefit recreation by assuring or improving recreation opportunities available in the Shirley Mountains.

All 140 miles of 9 eligible river segments would be determined to be and managed as suitable for inclusion in the Wild and Scenic River System. The WSR designation would preserve the natural recreational setting and experience along the river corridor in ways similar to those of WSA IMP. These segments would be protected from human impacts that would impair their suitability for designation. This would eliminate motorized recreational opportunities along segments tentatively classified as wild, but would enhance primitive waterway-related recreation opportunities.

Transportation and access management actions limiting BLM road densities to levels that do not diminish or adversely affect other resources or resource values would help prevent habitat fragmentation and linear visual intrusions that would alter the naturalness of the recreational setting.

Vegetation management priorities to control noxious and invasive species by maintaining or restoring native weed-free communities would maintain or improve the naturalness of the recreation setting. Prohibitions against recreational site development in Colorado butterfly plant or occupied Ute ladies’-tresses plant habitat would have a negligible impact on recreational opportunities because the known habitat for both species is in the far eastern portion of the RMPPA where there is little public land and no recreational development is planned. Vegetation treatments would be applied to meet standards for rangeland health and watershed function, and to achieve DPC with an emphasis on habitat improvement for wildlife, including Special Status Species. The treatment activities would temporarily displace recreationists to alternative areas and would temporarily alter the recreational setting. However, the long-term impacts of treatment actions would greatly benefit recreation resources by maintaining or enhancing the recreational setting and opportunities.

VRM management would be similar to Alternative 2 except that the North Platte River SRMA, the area surrounding the Ferris Mountains, the JO Ranch area, and some areas around the Adobe Town WSA would be managed as VRM Class II. This significant increase in Class II VRM acreage would protect a far greater portion of the RMPPA than Alternatives 1 or 2 from visual intrusions that would reduce the quality of the recreational setting. The checkerboard land ownership pattern would be managed as a Class III VRM, which would allow for more alterations to the landscape. This would alter the recreational setting, potentially displacing some users to other areas. Because of access issues within the checkerboard land ownership pattern, these areas are not suitable for recreational opportunities; therefore, the impacts to recreation from Class III objectives would be minimal.

Water quality, watershed, and soils management would have similar impacts as those described in Alternative 1, except that surface discharge of produced waters from oil and gas development would be restricted and management actions for the Encampment watershed would be more restrictive. Surface discharge of produced waters would not be allowed from federal leases in the Colorado River Basin and would only be approved in the Great Divide and Platte Basins when the surface discharge would meet BLM land management objectives. These management actions would completely remove or severely limit impacts to water quality that would potentially alter recreational fishing opportunities (see impacts describe in Alternative 1). Management actions in the Encampment watershed (Map 2-19) would restrict new permanent roads or facilities on lands administered by BLM. The majority of these lands are within the Encampment River WSA; however these actions could affect recreational opportunities by precluding new recreational facilities.

Efforts to preserve and enhance the New World Iberian genotype and associated phenotype in the Lost Creek wild horse herd would ensure future opportunities for viewing these unusual wild horses. The population objective for this herd would more than double from 70 to 165, which would increase the opportunity to experience wild horse viewing.

Impacts from wildlife and fisheries management would be similar to those identified under Alternative 1, except spatial and temporal protective measures increase greatly reducing opportunities for recreational management projects. These actions, however, would increase protection for most species and associated habitats, which would benefit recreational settings and opportunities. Priority would be given to achieving the desired plant community in addition to meeting Standards for Healthy Rangelands, which would maintain or improve wildlife habitat and therefore maintain or improve the recreation settings and opportunities.

Summary

Impacts to recreation would be markedly reduced under this alternative as compared to the other alternatives. An increase in use restrictions, including closure of the WSAs to OHV use, mineral withdrawals and closures, increased avoidance acreage, and the prohibition of offroad travel for camping and big game retrieval, would largely contribute to this reduction.

Recreation resources and opportunities would benefit from the addition of four new SRMAs and the expansion of the Shirley Mountains SRMA acreage, the addition of the JO Ranch to the Sand Hills ACEC, as well as potential consolidation by exchange of inholdings within the SRMAs.

All 140 miles of eligible segments would be determined to be and managed as suitable for inclusion in the Wild and Scenic River System, which would protect them from human impacts that would impair their suitability for designation.

VRM management class designation changes would improve or enhance the quality of the recreation setting in most of the RMPPA over the long term.

Management actions would increase protections for fish and wildlife habitat, which would enhance the recreation setting and recreational opportunities related to fish and wildlife.

Oil and gas development would result in long-term reduction of recreation use in areas of high or moderate oil and gas potential, which would have a significant impact to recreation.

4.11.5 Impacts Under Alternative 4: Proposed Plan

Impacts on recreation resources from cultural resources, minerals, paleontology, water quality, watershed and soils management, and wild horse management would be similar to those identified in Alternative 1.

Impacts from livestock management, the Sand Hills/JO Ranch expansion ACEC, Blowout Penstemon ACEC, vegetation management, and wildlife and fisheries management would be similar to those identified under Alternative 3.

Fire and fuels management impacts to recreation resources would be the same as Alternative 1, except 8,000 acres per year would be burned.

Impacts on recreation from forest management would be similar to those identified under Alternative 1, except that approximately 6,700 fewer acres would be available for commercial timber harvest. This would reduce the short-term displacement of recreationists and potential conflicts between recreationists and commercial timbering activities.

Impacts to recreational resources from lands and realty management actions will be similar to Alternative 1, except approximately 46,690 fewer acres would be closed to operation of public land laws, including disposal, and to mineral location under the mining laws. Some 46,230 acres would be considered for disposal and therefore potentially available for exchange in order to attain inholdings in WSAs or SRMAs. Acquiring inholdings through exchange would simplify management of these SD/MAs and make it easier for the public to avoid trespassing on private lands.

Lands and realty management actions would avoid where possible the placement of energy development facilities in avoidance areas so as to protect important resource values. The impacts to recreation would be similar to Alternative 1 where opening recreational destination areas to development affects such areas by altering the settings. Additional BMPs would be required in areas that cannot be avoided. However, additional acres identified for avoidance surrounding recreational destinations not included in Alternative 1 would preserve the recreation settings.

In WSAs and specific SD/MAs, all offroad travel would be prohibited. WSAs would be closed to motorized travel, except for the Ferris Mountain WSA, which would limit OHV use to designated road and vehicle routes. In conformance with Wyoming BLM OHV policy, in the rest of the RMPPA, OHV management actions would allow OHV use 300 feet off designated or existing roads and vehicle routes to retrieve big game and to access primitive campsites. This management action does not apply to areas closed to OHV use such as WSAs and WSR corridors. Existing campsites already have adequate vehicular access; however, the action would potentially alter opportunities to access remote campsites. The acreage of seasonal closures and roads limited to designated roads and closed to over-the-snow vehicles would be the same as in Alternative 3. All other offroad OHV use would be prohibited, except in the Dune Ponds CMA (Map 2-44). These actions would reduce the potential for primitive route proliferation and maintain the natural setting important for recreationists.

Impacts from recreation management actions to recreation resources would be similar to those of Alternative 3, except that mineral closures would occur within 1/4 mile of developed recreation sites rather than 1/2 mile. This would provide more protection of the recreational setting at developed recreation sites than Alternative 1. As per Wyoming BLM policy, Special Recreation Permits would not be issued for prairie dog hunting. This would help preserve the habitat for the black-footed ferret and, therefore, wildlife viewing opportunities for this T&E species.

The Shirley Mountain SRMA would be expanded to include 13,380 additional acres. This action would benefit recreation by assuring or improving recreation settings and opportunities available in the Shirley Mountains.

The North Platte River SRMA would be closed to mineral material disposal. This would reduce the possibility of development adjacent to the river impacting the river recreation experience and visual resources.

Impacts to recreation management from the OHV SRMA would be the same as those described in Alternative 2.

Jelm Mountain, the Pedro Mountains, the Rawlins Fishing sites (Teton Reservoir and Rim Lake recreation sites), and the Laramie Plains Lakes (Lake Hattie Reservoir and Twin Buttes Lake) would be managed as SRMAs. This would allow a higher level of recreation management for these areas to preserve or improve the quality of recreation opportunities available in the RMPPA. Impacts of the creation of these SRMAs would be the same as those of Alternative 3.

Impacts resulting from SD/MAs on recreation would be similar to those under Alternative 1, except for specific SD/MAs discussed below.

Protections that would be afforded to SD/MAs would benefit recreation, primarily because a greater area within the SD/MAs would be subject to restrictions on surface disturbing activity, increased closures to mineral development, and active pursuits of land tenure adjustments. These actions would have long-term impacts in the form of enhanced recreational opportunities and a reduced probability of user conflicts.

The Adobe Town WSA, Encampment River Canyon WSA, Prospect Mountain WSA, and the Bennett Mountains WSA would be closed to motor vehicles. The Ferris Mountain WSA would allow OHV use on designated roads and vehicle routes. While this is an additional 45,840 acres of land closed to motorized access, it results in the closure of less than 5 miles of existing legal routes and is thus not a significant loss of OHV opportunities. These closures would maintain and enhance the recreational settings and opportunities available for non-motorized primitive and unconfined experiences.

The Cave Creek Cave (within the Shirley Mountain SRMA) would be managed as an ACEC (240 acres) to protect cave resources. The cave gate would be locked for 1 month longer than under the other alternatives. These actions would benefit recreation by assuring or improving recreation settings and opportunities available in the Shirley Mountains, except during the one additional month when the cave gate is locked.

Historic Trails management actions would preclude disruptive and surface disturbing activities within the 1/4 mile or the visual horizon of contributing segments of the historic trails, which would maintain the recreational settings.

Managing the Cow Butte/Wild Cow area as a WHMA and closing it to new oil and gas leasing and mineral material disposals would help retain the quality of the recreational setting. Limiting vehicular

traffic to designated routes would reduce the probability of route proliferation in this area, also helping to retain the recreational setting.

Management actions closing the Continental Divide National Scenic Trail SRMA to mineral material disposal would maintain or enhance the recreational setting along the trail.

The Encampment River would be determined as suitable for inclusion in the Wild and Scenic River System and classified as “wild”. The suitability determination would preserve the recreational experience along the river corridor in ways similar to those of WSA IMP. The segment would be protected from human impacts that would impair its suitability for designation. This would enhance primitive waterway-related recreation opportunities.

Transportation and access management would impact recreation because areas along the Continental Divide National Scenic Trail, Ferris Mountains WSA, Big Creek access on the North Platte River SRMA, Shirley Mountains SRMA and several other popular areas would be classified as high importance for pursuing legal access. This would potentially provide greater access to recreational opportunities. Consideration of road densities during the analysis process and authorization of surface disturbing and disruptive activities would potentially limit detrimental impacts to recreational settings in the RMPPA.

Impacts to recreation resources from VRM management would be similar to those described in Alternative 3, except the areas surrounding the Historic Trails will not be managed as Class II.

Summary

Most programs, with the exception of minerals, would have a positive impact on recreational settings in the RMPPA. Stipulations applied to mineral activities by various other resource programs would result in reduced surface disturbing activities, which would further protect visual resources, wildlife areas, Historic Trails, SRMAs, and other areas that have important recreation values from minerals impacts.

Oil and gas development would result in long-term reduction of recreation use in areas of high or moderate oil and gas potential, which would have significant impacts to recreation.

4.11.6 Continental Divide National Scenic Trail SRMA

4.11.6.1 Impacts Common to All Alternatives

The 1/4 mile-wide corridor of the Continental Divide National Scenic Trail (CDNST) SRMA would be managed to provide trail users opportunities to view the diverse topographic, geographic, vegetative, wildlife, and scenic phenomena that characterize the CDNST and observe human uses of natural resources. Where the trail passes through intermingled land ownership, it would follow state highways, and county and BLM roads because these routes provide the only legal public access.

Minerals management actions would potentially allow surface disturbance and visual intrusions in and adjacent to the CDNST because the area would be open to new oil and gas leasing with an NSO stipulation and intensive management of surface disturbing and disruptive activities on existing leases. However, the CDNST is in an area of low oil and gas potential, so development is unlikely. Minerals development and associated lands and realty actions would potentially increase the number of vehicles on the BLM, county, and state roads, which could pose conflicts between recreationists and industry vehicles where the CDNST follows these roads. Development of oil and gas in or near the CDNST corridor would degrade the scenic quality along the trail resulting in a less desirable recreational experience for some people. Oil and gas facilities, improved roads, equipment, vehicles, pipelines, and personnel deviate from

the rustic experience some recreationists seek along the CDNST. This would also alter the recreation experience for some by converting the area from a front country setting to an industrialized rural setting. However, developments would also provide opportunities for visitors to observe the use of natural resources and multiple-use activities on public lands.

The CDNST would be managed as an SRMA. Land exchanges and easement acquisitions would be pursued to improve the continuity of the trail where opportunities arise. Implementation of the CDNST Comprehensive Plan would potentially provide access in closer proximity to the Continental Divide. Erection of kiosks along the trail would provide information and education about natural and cultural resources in the area including early transportation routes, the history of the area, and the importance of protecting resources. This would increase visitor awareness and reduce the potential for incidental or purposeful disturbance of natural and cultural resources. The corridor would be an exclusion area for wind energy development; therefore, there would be no impacts from this development on the visitors or setting of the SRMA.

Achievement of the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would enhance hunting, fishing, and wildlife viewing opportunities along the CDNST through the maintenance, enhancement, or restoration of vegetation communities and vegetative health. This would maintain or improve the quality of recreation settings along the CDNST. Improved vegetation condition would heal vehicle route scars and historic surface disturbance, stabilize soils to stop or prevent erosion and sedimentation, and provide improved habitat for wildlife, which would improve the quality of recreation experiences in the SRMA. Closures during prescribed burns would temporarily require trail visitors to avoid treatment areas, but management of vegetative resources would improve range conditions and wildlife habitat to the benefit of visitors seeking wildlife viewing opportunities. Short-term impacts from vegetation treatments along the CDNST would create undesirable settings in localized areas, particularly for camping, until after revegetation occurs.

4.11.6.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, cultural resources, fire and fuels, forest management, livestock grazing management, OHV, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access, visual resource management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management would have little or no impact on the CDNST SRMA.

The SRMA would be open to locatable mineral entry, mineral material disposal, and the operation of the public land laws. These actions would potentially allow developments that would degrade the quality of recreation settings in the SRMA, but it would also provide opportunities for visitors to observe the use of natural resources on public lands.

Vegetation management actions would result in weed treatments within the SRMA. However, the focus of treatments to eliminate small and control large infestations would allow large patches of weeds to remain in the SRMA, potentially degrading the recreational experience and trail setting.

Summary

Oil and gas development is not expected to reduce the desirability of recreation settings in proximity to the trail because the CDNST is located in an area of low oil and gas potential. The long-term effects of vegetation treatments would be an enhanced recreational experience from improved vegetation health. Overall, the 1/4-mile corridor would minimize disturbance and CDNST visitors would be able to observe both man-made and natural multiple uses of natural resources on public lands.

4.11.6.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, cultural resources, fire and fuels, forest management, livestock grazing management, OHV, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access, visual resource management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management would have little or no impact on the CDNST SRMA.

Minerals and lands and realty management actions would have the same impacts as Alternative 1.

With priority for noxious and invasive species control concentrated in areas where commodity benefits would be enhanced, vegetation management would benefit recreation. This would improve the aesthetic appeal of the recreational setting.

Summary

Oil and gas development is not expected to reduce the desirability of recreation settings in proximity to the trail because the CDNST is located in an area of low oil and gas potential. The long-term effects of vegetation treatments would be an enhanced recreational experience from improved vegetation health. Overall, the 1/4-mile corridor would minimize disturbance and CDNST visitors would be able to observe both man-made and natural multiple uses of natural resources on public lands.

4.11.6.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, cultural resources, fire and fuels, forest management, livestock grazing management, OHV, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access, visual resource management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management would have little or no impact on the CDNST SRMA.

The 1/4 mile-wide CDNST SRMA would be closed to locatable mineral entry, mineral material disposal, and land tenure adjustments, thereby reducing hazards to CDNST visitors. Development and activity outside this narrow corridor would still provide visitors the opportunity to observe the use of natural resources on public lands, although the related oil and gas facilities, equipment, vehicles, pipelines, and personnel detract from the rustic experience many recreationists are seeking along the CDNST.

The maintenance or restoration of native weed-free communities would maintain or improve recreation settings along the CDNST SRMA. Vegetation treatments applied to meet standards for rangeland health and watershed function, and to achieve DPC with an emphasis on wildlife habitat improvement would improve the naturalness of recreation settings and provide improved wildlife viewing opportunities along the CDNST.

Summary

CDNST SRMA closures to mineral development and land tenure adjustment, along with increased vegetation treatments, would preserve the quality of recreational settings along the trail corridor.

4.11.6.5 Impacts Under Alternative 4: Proposed Plan

Air quality, cultural resources, fire and fuels, forest management, livestock grazing management, OHV, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access, visual resource management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management would have little or no impact on the CDNST SRMA.

The CDNST SRMA would be open to locatable mineral entry and land tenure adjustments, which would allow for development of mineral resources in this area and thereby detract from the rustic experience many recreationists are seeking along the CDNST and increase the number of hazards to CDNST visitors.

Vegetation management impacts from weed control would be the same as Alternative 1.

Summary

Implementing NSO restrictions on new oil and gas leasing, intensively managing development on existing leases, and increasing vegetation treatments within the CDNST SRMA would help to preserve the quality of recreational settings along the trail corridor.

4.11.7 North Platte River SRMA

4.11.7.1 Impacts Common to All Alternatives

Forest management, paleontology, other SD/MAs, and wild horse management would have little or no impact on the North Platte River SRMA.

Management actions for cultural resources would restrict, preclude, or most likely result in relocation of potential recreational developments in areas where the integrity of the cultural site setting contributes to NRHP eligibility along the North Platte River.

The Upper North Platte River, from Sheep Rock north of Saratoga upstream and the Encampment River, would be managed as WUI. From Sheep Rock to Seminoe Reservoir, lands along the river would be managed as intermixed public and private. Wildland fire suppression would restrict burned acreage, which would reduce erosion and sedimentation entering the river. Wildland fire would not be used to return fire to its natural role in the ecosystem along the North Platte River. Decadent vegetation would not be removed and habitat conditions would not be improved using wildland fire.

Acquisition of nonfederal lands would potentially improve public access and help disperse usage along the North Platte River corridor. Increased access to the North Platte River would expand the recreational opportunities and enhance the perception of solitude by further dispersing river users.

Mineral developments, such as the Seminoe Road CBNG Project, would potentially be visible from portions of the North Platte River and Seminoe Reservoir, diminishing the recreational experience. The river downstream of I-80 is in the checkerboard, so there is little legal public access to the SRMA except by water other than at the Dugway and Lower Dugway access points. A ridge separates and screens the Dugway from view of the Seminoe Road CBNG Project. The river corridor south of the Dugway to approximately 6 miles south of I-80 is currently leased. This area, all the way to the south SRMA boundary, has low oil and gas potential and is not likely to be developed.

Increased traffic associated with mineral development, particularly in the Seminoe Road area, would pose a hazard to river recreationists driving to and from river and reservoir access points. Oil and gas development (i.e., improved roads, facilities, equipment, vehicles, pipelines and personnel) would degrade the localized scenic quality and recreation setting if these intrusions were visible from the water or banks where there is legal public access. These developments would alter the recreation experience by converting it from a predominantly natural setting to a more industrialized setting, which would make the SRMA less desirable for most recreationists.

Management actions for the North Platte River SRMA—which includes the Encampment River from the confluence with the North Platte up to the WSA boundary—to pursue increased access and disperse usage would help preserve the uncrowded river experience desired by most visitors. For example, commercial outfitting businesses would be allotted times for river launches during peak usage periods to reduce crowding. Stipulations limiting the amount of parking used by commercial outfitters would also alleviate some of the crowding at launch and take out points.

The vegetation management actions to maintain, enhance, or restore vegetative health and meet the Wyoming Standards for Healthy Rangelands would maintain or improve the quality of the recreation setting. Improved plant vigor and density, reduction of noxious and invasive species, improved plant diversity and the related improvement of the aesthetics of treated areas would improve the appeal of recreation settings.

4.11.7.2 Impacts Under Alternative 1: Continuation of Existing Management

The North Platte and Encampment Rivers would be managed as an SRMA for high-quality recreational opportunities, especially floating, fishing, camping, and sightseeing. Other SD/MAs, water quality, watershed, and soils management would have minimal impact on the SRMA.

Lands and realty management actions would designate the North Platte River SRMA as an avoidance area for utility/transportation systems and wind energy development. Designation as an avoidance area would reduce the possibility of wind energy development in the river corridor, which has only a fair wind energy potential. Developments would potentially occur adjacent to the 1/4-mile corridor on either side of the river where there is good to excellent potential on the ridges creating a visual intrusion that would diminish the recreational experience. A designated utility corridor currently crosses the North Platte River adjacent to I-80; therefore, further developments into this area would have little additional impacts.

Mineral development in areas of high and moderate oil and gas potential, such as the Seminoe Road Coalbed Natural Gas Project, where development is expected to occur in proximity to the river, would reduce the desirability of recreation settings wherever mineral facilities were visible or audible. The SRMA would be open to oil and gas leasing with intensive management of surface disturbance and, therefore, development would potentially impact the recreational experience along the river corridor with noise, fugitive dust, odors, visual intrusions, and industrial traffic. The SRMA would be open to locatable mineral entry and mineral material disposals with restrictions to maintain the visual resource. These activities would potentially create new vehicle routes, fugitive dust, and noise that would detract from the quality of the recreation experience. The potential for locatable mineral development is low; therefore, these impacts would be minimal or unlikely to occur.

OHV-produced noise and decreased air quality would diminish the recreational experience for other recreationists who seek solitude and natural settings for fishing, floating, camping, hiking, and other nonmotorized recreational activities. Allowing OHV travel on all existing roads and vehicle routes within the SRMA would have negligible impacts because there are so few public access points along the river. Congestion in popular recreation areas and conflicts among various visitors would diminish the quality of the recreational experience for some.

SRMA management would require intensive management of all surface disturbing activities within the SRMA including application of BMPs (Appendix 25) to reduce degradation of the visual setting and maintain the quality of the recreational experience.

The two segments found to be eligible for inclusion in the Wild and Scenic River System would be managed in accordance with tentative classification as recreational. They would be so managed as to

protect their outstandingly remarkable values, free-flowing nature, and recreational values to the degree that BLM has authority and within the parameters of decisions made in previous planning documents to retain their eligibility until such time as suitability determinations are made (BLM Manual 8351, .32C and .33C). The attributes that make them eligible would be protected, and WSR actions would help preserve the current recreation experience in the eligible segments of the SRMA. These segments would be closed to locatable mineral entry and mineral material disposals, which would eliminate the potential for these activities to occur.

The long-term effects of vegetation treatments would be enhancement of the recreational experience from improved vegetation health along the river. Recreational site development would not be allowed in occupied Ute ladies'-tresses plant habitat, which would have negligible impact on the SRMA because this species is not known to have habitat along the North Platte River. Vegetation management actions would result in some weed treatments within the SRMA. However, the focus of treatments to eliminate small and control large infestations would allow large patches of weeds to remain in the SRMA, potentially degrading the recreational experience. Noxious and invasive weeds would limit river access by creating physical barriers to foot traffic in localized areas and lead to erosion that would degrade water quality and wildlife and fish habitat.

While BLM treats weeds on public lands at primary river access points such as Bennett Peak and Corral Creek campgrounds, the majority of lands along the river are state or private, and the landowners are responsible for appropriate weed treatments. If either BLM or the landowners failed to treat weeds to at least control the weed populations, then weed infestations would spread.

Little of the shoreline between Bennett Peak Campground and Seminoe Reservoir is public land, so the potential for visual impacts from developments on public land adjacent to the river is minimal. Developments on private lands would not be subjected to the same requirements. VRM Class II areas along the Upper North Platte River would help retain or improve the quality of the recreational setting. North of Corral Creek, the river enters VRM Class III, where more visually intrusive modification of the natural environment such as surface disturbance, structures, and facilities may detract from the recreational setting. Developments on public lands north to the Dugway would be required to comply with VRM Class III management through the application of BMPs and mitigation. Developments north of the Dugway would be required to comply with VRM Class II management through the application of BMPs and mitigation. Vegetative screening along the shoreline is particularly sparse between Dugway and Seminoe Reservoir, and it would be difficult to prevent development from being visible from the water. Visual intrusions would degrade the visual setting and the river experience for some recreationists.

Summary

The North Platte River would be managed as an SRMA for high-quality recreational opportunities, especially floating, fishing, camping, and sightseeing.

Mineral development in the Seminoe Road Coalbed Natural Gas Project would reduce the desirability of recreation settings wherever mineral facilities are visible or audible.

Vegetative treatments would enhance the recreational experience by improving vegetative health and wildlife habitat, thereby improving the naturalness of the experience and the quality of wildlife viewing opportunities. The focus of weed treatments to eliminate small patches and control large infestations would allow large patches of weeds to remain in the SRMA.

4.11.7.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The North Platte River would not be managed as an SRMA to provide high-quality recreational opportunities along the river corridor. Impacts to the North Platte River area from minerals, OHV, water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Because the area would not be an SRMA, it would not be an avoidance area for wind energy development and utility/transportation corridors. But because the area along the river has only fair wind energy potential, the likelihood of this area being developed is low. Development of wind energy adjacent to the river corridor where wind potential is higher and allowance of utility/transportation corridors through the area would have the same impacts as those described in Alternative 1.

SRMA management actions would require management of all surface disturbing activities within the SRMA, including application of BMPs (Appendix 25) to reduce degradation of the visual setting and maintain the quality of the recreational experience.

No recommendations would be made for Wild and Scenic River suitability, and no segments would be managed to retain their eligibility. Thus, no indirect protections would be afforded by WSR designation. This would potentially diminish the recreation setting by allowing other management actions to alter conditions along segments of the North Platte River.

The priority for noxious and invasive species control on BLM lands would be concentrated in areas where commodity benefits would be enhanced. This would result in some weed treatments within this river area; however, the majority of lands along the river are state or private, where BLM does not have jurisdiction. Therefore, the impacts would be the same as those described under Alternative 1.

The VRM Class II portion of the North Platte River area would be changed to Class III VRM because Class II is difficult to manage in mixed land ownership, and BLM has no authority over actions on private lands. Developments would be managed to conform to Class III objectives, which would maintain the recreational setting of the area.

Summary

Mineral development in the Seminoe Road Coalbed Natural Gas Project would reduce the desirability of recreation settings wherever mineral facilities are visible or audible. The North Platte River would not be managed as an SRMA. Only standard mitigation measures would be used to manage surface disturbing activities on BLM lands within 1/4 mile of the river, which would potentially detract from the quality of the river recreation experience.

4.11.7.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The North Platte River would be managed as an SRMA and would include the area within 1/2 mile of either side of the river to provide high-quality recreational opportunities along the river corridor.

Impacts to the North Platte River SRMA from vegetation would be the same as those identified in Alternative 1.

Withdrawing the North Platte River SRMA from operation of the public land laws would not allow for public lands to be disposed or exchanged. There is an existing utility corridor crossing the North Platte River adjacent to I-80 that would be maintained. Authorization of new ROWs would be limited to the existing utility corridor or situations where valid existing rights would be upheld.

OHV-produced noise and decreased air quality would diminish the recreational experience for other recreationists who seek solitude and natural settings for fishing, floating, camping, hiking, and other non-motorized recreational activities. Allowing OHV travel on all designated roads and vehicle routes within the SRMA would have negligible impacts because there are so few public access points along the river. Congestion in popular recreation areas and conflicts among various visitors would diminish the quality of the recreational experience for some.

The SRMA would be closed to new oil and gas leasing, and existing leases would be managed to minimize negative effects to the recreational setting. The SRMA would be closed to locatable mineral entry and mineral material disposals, which would eliminate the potential for degradation of the recreational setting. Eliminating the potential for degradation would have a long-term benefit to the recreational setting because the quality of the setting would be retained and fewer conflicts would occur between industry and recreationists at public access points.

Intensive management of all surface disturbing activities within the SRMA would include the application of BMPs (Appendix 25) to reduce degradation of the visual setting and maintain the quality of the recreational experience.

All eligible waterways, including the North Platte River segments, would be determined to be and managed as suitable for inclusion in the Wild and Scenic River System. The WSR designation would protect the segments from human impacts that would impair their suitability for designation. This would preserve scenic waterway-related recreation opportunities. Management actions associated with the recreational classification in the WSR System would parallel management actions under the SRMA.

VRM management would be similar to Alternative 2 except that the North Platte River SRMA would be managed as VRM Class II south of the Saratoga area. Developments within the VRM Class II areas would be required to repeat the basic elements of form, line, color, and texture found in the predominant natural features of the landscape (Appendix 25). This expansion of the Class II VRM area would better protect the upper river from visual intrusions on federal lands that would reduce the quality of the recreational setting.

Water quality, watershed, and soils management actions would preclude new permanent roads or structures within the Encampment River watershed, which would preclude the creation of new access roads or recreation facilities within the SRMA.

Summary

The SRMA would be protected from mineral development, except along the river segment from approximately 6 miles south of I-80 to the tail waters of Seminoe Reservoir where oil and gas leases exist. Development would potentially be visible and/or audible from the river itself and the few public access points within this stretch of river.

OHV travel would be allowed on designated roads and vehicle routes within the SRMA, which would have negligible impacts because there are so few public access points along the river.

Two segments of the North Platte River would be determined to be and managed as suitable for inclusion in the Wild and Scenic River System. This approach would preserve scenic waterway-related recreation opportunities.

The North Platte River SRMA would be managed as VRM Class II south of the Saratoga area and become therefore an avoidance area for utility/transportation systems and wind energy. This would

protect the upper river from visual intrusions that would reduce the quality of the recreational settings in the SRMA.

Water quality, watershed, and soils management actions would preclude new permanent roads or structures within the Encampment River watershed which would preclude the creation of new access roads or recreation facilities within the SRMA.

4.11.7.5 Impacts Under Alternative 4: Proposed Plan

Fire and fuels management, lands and realty management, recreation resources, vegetation management, and wildlife and fisheries impacts would be the same as those identified in Alternative 1.

VRM and WSR management in the SRMA would be the same as Alternative 2.

Lands and realty management actions would have the same impacts as those described under Alternative 1.

OHV and watershed and soils management in the SRMA would be the same as Alternative 3.

The North Platte River SRMA would be open to new oil and gas leasing with an NSO restriction on surface disturbing activities. Existing oil and gas leases would be intensively managed, but development of existing leases would still potentially impact the recreational experience along the river corridor with noise, fugitive dust, odors, visual intrusions, and industrial traffic. Intensive management of all other surface disturbing activities within the SRMA would include the application of BMPs (Appendix 25) to reduce degradation of the visual setting and maintain the quality of the recreational experience.

Water quality, watershed, and soils management actions would avoid new permanent roads or structures within the Encampment River watershed, which would potentially preclude the creation of new access roads or recreation facilities within the SRMA.

Summary

No significant impacts are likely to occur to recreation management along the North Platte River SRMA. Most programs would have a positive impact on the river experience and setting, with the exception of minerals. However, restrictions applied to mineral activities by the SRMA and various other resource programs would result in reduced surface disturbing activities that, in turn, would further protect visual resources, wildlife areas, historic trails, and the SRMA. Water quality, watershed, and soils management actions would avoid new permanent roads or structures within the Encampment River watershed which would potentially preclude the creation of new access roads or recreation facilities within the SRMA.

4.11.8 OHV SRMA

4.11.8.1 Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.11.8.2 Impacts Under Alternative 1: Continuation of Existing Management

There would be no impacts from any resource program under this alternative, because the OHV SRMAs would not be created.

Summary

OHV SRMAs would not be created. There would be no impacts on OHV SRMAs from other programs.

4.11.8.3 Impacts Under Alternative 2: Emphasis on Development of Resources

OHV SRMAs would be created to reduce the adverse effects of OHV use on the public lands. OHV SRMAs would provide safe and challenging riding opportunities for skill development and practice away from residential areas, livestock and wildlife, and other public land users. In addition, the SRMAs would potentially reduce road proliferation on public lands and allow for a reduction of road density in the RMPPA. OHV SRMAs would also give BLM a forum for familiarizing the OHV community with land use ethics, riding ethics, and regulations as well as the negative effects of improper OHV use and how to use OHVs in an environmentally friendly manner.

Potential locations for OHV SRMAs would be limited by public safety issues and the concerns of other programs, including soil, water, air, fire and fuels, forest management, minerals, HAZMAT, wildlife, fisheries, cultural, livestock grazing, paleontology, SD/MAs, wild horses, recreation resources, vegetation, and visual resource management. Any proposed location would consider proximity to communities and towns to minimize visual intrusions, dust, erosion, water quality degradation, and noise while siting potential OHV SRMAs in a way that encourages use.

Summary

OHV SRMAs would potentially be created. Public safety, proximity to population centers, and other programs' actions or concerns would limit and influence potential OHV riding area locations. The presence of OHV riding and training areas and the opportunity to promote safe riding skills and natural resource ethics and awareness would contribute to reductions in violations of public land laws and regulations and reduce resource damage from improper OHV use.

4.11.8.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts would be the same as Alternative 1 because OHV SRMAs would not be created.

Summary

Impacts under this Alternative would be the same as Alternative 1. OHV SRMAs would not be created; therefore, there would be no impacts to OHV SRMAs from other programs.

4.11.8.5 Impacts Under Alternative 4: Proposed Plan

Impacts would be the same as Alternative 2.

Summary

OHV SRMAs would potentially be created. Public safety, proximity to population centers, and other programs' actions or concerns would limit and influence potential OHV riding area locations. The presence of OHV riding and training areas and the opportunity to promote safe riding skills and natural resource ethics and awareness would contribute to reductions in violations of public land laws and regulations and help reduce resource damage from improper OHV use.

4.11.9 Jelm Mountain SRMA

4.11.9.1 Impacts Common to All Alternatives

Air quality, cultural resources, fire and fuels, forest management, livestock management, minerals management, OHV management, paleontology, SD/MAs except Jelm Mountain SRMA and Historic Trails SD/MA, transportation and access management, visual resource management, water quality, watershed and soils management, wild horse management, and wildlife and fisheries management would have little or no impact on Jelm Mountain SRMA.

Lands and realty management actions would consider acquisition of nonfederal lands, which would potentially improve public access in the intermingled land ownership pattern on Jelm Mountain. Increased access to Jelm Mountain would expand the recreational opportunities and enhance the visitor's perception of solitude by further dispersing visitors. Land exchange would facilitate increased or improved public access to desired recreation resources.

Recreation opportunities would be managed to provide for visitor health and safety and coordinate with other programs to minimize conflicts and adverse impacts on recreation resources. New recreation sites would be considered for development to protect resources and enhance recreation opportunities on Jelm Mountain. Consultation and coordination with the University of Wyoming regarding recreational development within the Jelm Mountain SRMA would assure the continued operation of the Wyoming Infrared Observatory (WIRO) facility and its ranking as one of the premier infrared observatories in the world. Upgrades to the WIRO or potential new facilities related to the WIRO would be consistent with the middle country recreational setting in the Jelm Mountain SRMA.

Where the Historic Trails SD/MA segment intersects the Jelm Mountain SRMA, management actions that occur within the setting of the Historic Trails that contribute to NRHP eligibility would be mitigated to minimize significant effects. Mitigation measures would be used to minimize the visual intrusions that would dominate the landscape associated with the Historic Trails (Appendix 5) and reduce potential impacts to the setting of the area.

4.11.9.2 Impacts Under Alternative 1: Continuation of Existing Management

Jelm Mountain would not become an SRMA. Impacts on the Jelm Mountain area would be negligible from air quality management, cultural resource management, fire and fuels management, forest management, livestock management, OHV management, paleontology, recreation management, other SD/MAs, transportation and access management, VRM, wild horse management, and wildlife and fisheries management. Jelm Mountain is in an area of low oil and gas potential. The area is not currently leased and fluid mineral development is not anticipated. The area would be open to locatable mineral entry and mineral material disposal, so surface disturbing and disruptive activities would potentially occur, thereby creating noise, dust, visual intrusions, and roads that would detract from the recreation experience on Jelm Mountain.

The Jelm Mountain area would not be an avoidance area for utility/transportation systems and wind energy development. This would potentially allow for the creation of new visual intrusions that would degrade the quality of the recreational setting on Jelm Mountain. The area would be open to the operation of the public land laws, so the recreational settings would potentially be degraded from industrial traffic, noise, fugitive dust, surface disturbance, and visual intrusions.

OHV-produced noise and decreased air quality would diminish the recreational experience for those who seek solitude and natural settings recreational activities. Allowing OHV travel on all existing roads and

vehicle routes within the area would maintain existing access in the area. Congestion in popular recreation areas and conflicts among various visitors would diminish the quality of the recreational experience for some.

Historic Trail management would result in the trail corridor being an avoidance area where possible to reduce the impacts from surface disturbing and disruptive activities. This would help maintain the setting and recreational experience in the area.

Short-term impacts from vegetation treatments would temporarily cause recreationists to be displaced from treated areas to other more desirable areas until after revegetation occurs. The long-term effects of the vegetation treatments would be enhanced recreational experience from improved vegetation health. Temporary closures during prescribed burns would prohibit recreational use, but management of vegetation resources would improve range conditions and wildlife habitat to the benefit of recreationists seeking wildlife viewing opportunities.

Vegetation management actions would potentially result in weed treatments within the area. However, the focus of treatments to eliminate small and control large infestations would allow large patches of weeds to remain in the area, potentially degrading the recreational experience and setting.

Summary

Jelm Mountain would not become an SRMA. Mineral development would potentially create noise, dust, visual intrusions, and roads that would detract from the recreation experience on Jelm Mountain. The area would be open to the operation of the public land laws potentially degrading recreational settings due to industrial traffic, noise, fugitive dust, surface disturbance, and visual intrusions. OHV-produced noise and decreased air quality would diminish the recreational experience for other recreationists who seek solitude and natural settings. The long-term effects of the vegetation treatments would be enhanced recreational experience from improved vegetation health.

4.11.9.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on Jelm Mountain from air quality, cultural resource management, fire and fuels, forest management, lands and realty management, livestock management, minerals, OHV management, paleontology, other SD/MAs, Jelm Mountain area, recreation, transportation and access management, wild horse management, and wildlife and fisheries management would be the same as those identified in Alternative 1.

With priority for control of noxious and invasive species being concentrated in areas where commodity benefits would be enhanced, vegetation management would benefit dispersed recreation on Jelm Mountain by removing and controlling weed infestations that detract from the recreational experience.

Summary

Vegetation management would benefit dispersed recreation on Jelm Mountain with priority for control of noxious and invasive species being concentrated in areas where commodity benefits would be enhanced.

4.11.9.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Jelm Mountain would be managed as an SRMA. Impacts on Jelm Mountain from air quality, cultural resource management, fire and fuels, forest management, livestock management, minerals, paleontology,

other SD/MAs, recreation, transportation and access management wild horse management, and wildlife and fisheries management would be the same as those identified in Alternative 1.

An NSO restriction on surface disturbing and disruptive activities on new oil and gas leases, intensive management of existing oil and gas leases, and closures to locatable mineral entry, mineral material disposal and land tenure adjustments resulting in a loss of public land would protect the quality of recreation resources on Jelm Mountain. The Jelm Mountain SRMA would be an avoidance area for utility and transportation systems and wind energy development. This would help prevent the creation of new visual intrusions that would degrade the quality of the recreational setting on Jelm Mountain.

OHV travel would be allowed on designated roads and vehicle routes within the area allowing unnecessary or undesirable routes to be closed and reducing associated resource damage that detracts from the recreational setting. This would potentially reduce the amount of access routes open to motorized travel and diminish the recreational experience for some users.

Historic Trail management would result in the trail corridor being an exclusion area in which impacts from surface disturbing and disruptive activities would be eliminated. This would help maintain the setting and recreational experience in the area.

Vegetation management actions would be geared toward achieving the desired plant community and toward meeting Wyoming's Standards for Healthy Rangelands. Wildlife habitat and the recreation setting would be maintained or improved. Noxious and invasive species control would maintain or restore native weed-free communities thereby maintaining and/or improving the recreation setting by making it more natural and eliminating infestations of species that recreationists find unpleasant (like musk thistle and Canada thistle).

Summary

Jelm Mountain would be managed as an SRMA. This would allow a higher level of protection for the area to preserve or improve the quality of recreation opportunities. Control of noxious and invasive species would maintain or improve the quality of the recreation setting by maintaining or restoring native weed-free communities.

4.11.9.5 Impacts Under Alternative 4: Proposed Plan

Jelm Mountain would be managed as an SRMA. Cultural, fire and fuels, forest management, livestock management, paleontology, recreation resources, other SD/MAs, transportation and access management, visual resource management, water quality, watershed and soils management, wild horse management, and wildlife and fisheries impacts would be to the same as those of Alternative 1.

Impacts from minerals management would be similar to those identified under Alternative 1, except the SRMA would be closed to mineral material disposal. This would reduce the potential for surface disturbing and disruptive activities and associated noise, dust, visual intrusions, and roads.

Impacts from lands and realty, OHV, Historic Trails SD/MA, Jelm Mountain SRMA, and general vegetation management impacts would be the same as those identified under Alternative 3. Impacts from weed control would be the same as those described under Alternative 1.

Summary

Jelm Mountain would be managed as an SRMA. In many cases, the promotion of shorter duration of livestock use and manipulation of the season of use would incorporate timing of recreation to reduce livestock management impacts in some rangeland locations.

4.11.10 Pedro Mountains SRMA

4.11.10.1 Impacts Common to All Alternatives

Cultural resource management, forest management, minerals, OHV, paleontology, recreation resources, SD/MA (except the Pedro Mountain area), transportation and access management, vegetation, visual resource management, water quality, watershed and soils management, wild horse management, and wildlife and fisheries management actions would have little or no impact on the Pedro Mountains.

Wildland fire and fuels would manage the Pedro Mountains as a WUI area, and wildland fire, therefore, would be suppressed. This would protect Ponderosa Pine stands and maintain the visual setting of the area.

Lands and realty management actions to consider acquisition of nonfederal lands would potentially improve public access in areas with intermingled land ownership and facilitate increased or improved access to the area. Some 935,530 acres of existing withdrawals would be closed to public land laws and to locatable mineral entry, which would protect and maintain recreational resources. Other lands and realty management actions would result in surface disturbance that would alter the recreational settings and influence recreational activities, potentially displacing recreationists to alternative areas.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Development in areas with important resources, such as existing and proposed recreation sites and SD/MAs that contain important supplemental recreational values, would be avoided to reduce the impacts where possible. Developments would alter the typical back country recreational settings in the Pedro Mountains area by creating elements that would contrast against the natural settings and affect the recreational opportunities and activities in the area.

Livestock management actions would help achieve the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which would enhance recreation opportunities by maintaining the setting, opportunities, and experiences. In many cases, the promotion of shorter duration of livestock use and manipulation of the season of use would incorporate timing of recreation to reduce livestock management impacts. The presence of livestock in a landscape setting is probably not detrimental to the experience of most recreationists. However, on a site-specific level, recreationists would potentially be displaced in response to water quality issues and the presence of livestock. In some cases when livestock use is high, bacteria such as Escherichia coli would impact the recreational experiences and activities for portions of the year. The proximity to livestock and concern over their behavior would influence recreationists' safety or purpose for being. This would result in a less enjoyable experience and would potentially displace recreationists to another location or time of year when livestock are not present.

SD/MA management actions within the Pedro Mountain area would manage Ponderosa Pine stands to meet Wyoming Standards for Healthy Rangelands. Forest product removal would be prohibited to protect VRM and the recreational settings that would maintain the associated recreational values and experiences in this area.

4.11.10.2 Impacts Under Alternative 1: Continuation of Existing Management

The Pedro Mountains would not be an SRMA. Cultural, forest management, livestock grazing, paleontology, recreation resources, SD/MAs, water quality, watershed and soils management, wild horse management, and wildlife and fisheries management would have little or no impact on the Pedro Mountains.

Wildland fire management actions would allow wildland fire to play its natural role and would be used for resource benefit when appropriate. Short-term localized impacts to recreation from wildland fire and fuels management would result in temporary closure of areas during and after fire events and would displace recreationists to other areas. In the long term, the altered recreational setting would displace some recreationists but would also create new recreational opportunities and experiences.

Lands and realty management actions would potentially open new areas to recreational use that previously had limited access. This area would be open to the operation of public land laws, which would allow surface disturbance within the area and would detract from the visual setting and increase the potential for conflicts between recreationists and industry vehicles. Lands and realty management actions would also consider acquisition of nonfederal lands, which would potentially improve public access in the intermingled land ownership pattern. Increased access would expand the recreational opportunities and enhance the visitor's perception of solitude by further dispersing visitors. Land exchange would facilitate increased or improved public access to desired recreation resources.

OHV actions would allow off-road OHV use for "necessary tasks," big game retrieval, and to access primitive camping sites. Allowing offroad OHV use would result in the proliferation of new user-created routes and contribute to a middle country setting that would alter the recreational settings and goals for those seeking a primitive experience.

The Pedro Mountains would be open to oil and gas leasing, locatable mineral entry, mineral material disposal, and operation of the public land laws. Because there is little known potential for oil, gas, or minerals in the Pedro Mountains, impacts from oil and gas development would be negligible.

The Pedro Mountains would not benefit from additional SRMA-related protective mitigations, but other program management actions would indirectly benefit the area. The western half of the Pedro Mountains is managed as a Class II visual resource. This arrangement means that management activities be directed toward maintaining the surrounding landscape in a way that does not divert attention away from the natural setting. OHV use would be limited to existing roads and vehicle routes, which would maintain the opportunities for those who use OHVs to access the area. This action would also benefit those who seek a primitive experience away from existing roads and vehicle routes where OHV activities would be concentrated.

Transportation and access management actions would maintain an adequate road network to provide or maintain public health and safety and that would facilitate recreational access through intermingled land ownership patterns. This approach would maintain recreational opportunities, activities, and experiences in the Pedro Mountain area.

Short-term impacts from vegetation treatments would temporarily displace recreationists from the treated areas to alternative areas. The long-term effects of the vegetation treatments—reduced erosion and therefore reduced sediment loads in creeks and rivers, improved fish habitat, riparian bank stability, and structure and diversity of plants—could increase the diversity of wildlife in treatment areas. This diversity would enhance the recreational experience by improving the naturalness of the area and the probability of seeing wildlife. Closures during prescribed burns would temporarily prohibit recreational use, but

management of vegetation resources through prescribed burns would improve range conditions and wildlife habitat to the benefit of recreationists seeking wildlife viewing opportunities.

Western portions of the Pedro Mountains, in proximity to Pathfinder Reservoir, would be VRM Class II. The rest of the Pedro Mountains would be VRM Class III. Those areas managed as Class II would prohibit or intensively manage some actions that would preserve the character of the area. Areas managed as Class III would have less restrictions and would not have the same level of protection. Class II areas would maintain the recreation settings, while Class III would allow for alterations that would potentially displace recreationists who desire a more natural and primitive setting.

Summary

The Pedro Mountains would not become an SRMA. The area would not have the protections or the heightened recreation management focus afforded to an SRMA. The recreation setting in the Pedro Mountains would potentially be altered by development that would make it a less desirable place for dispersed primitive recreation.

No economic oil, gas, or mineral resources are known to exist in the Pedro Mountains. Although the area would be open to oil and gas leasing and mineral development, no impacts associated with these activities are anticipated.

Western portions of the Pedro Mountains, in proximity to Pathfinder Reservoir, would be VRM Class II. The rest of the Pedro Mountains would be VRM Class III.

4.11.10.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The Pedro Mountains would not become an SRMA. Cultural resources, fire and fuels management, forest management, lands and realty, livestock grazing, minerals, OHV management, paleontology, recreation resources, SD/MAs, transportation and access management, vegetation, water quality, watershed and soils management, wild horse management, and wildlife and fisheries impacts would be the same as those identified in Alternative 1.

Impacts from visual resources would be similar to those described in Alternative 1, except that the VRM Class II acreage would be reduced resulting in the majority of the Pedro Mountains managed a Class III. There would be more visual intrusion allowed from activities that would detract from the natural visual setting of the area.

Summary

The Pedro Mountains would not become an SRMA.

VRM Class II acreage would be reduced along the eastern side of the Pedro Mountains, which would allow more visual intrusion to the setting from development.

4.11.10.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The Pedro Mountains would be managed as an SRMA. Cultural, fire and fuels, forest management, livestock grazing, paleontology, recreation resources, SD/MAs (except for the Pedro Mountains SRMA), transportation and access, vegetation, water quality, watershed and soils management, wild horse management, and wildlife and fisheries management impacts would be similar to those of Alternative 1.

Impacts from visual resource management actions would be the same as Alternative 2.

The SRMA would be an avoidance area for utility and transportation-related ROWs, as well as wind energy development, which would help to retain the quality of the recreational setting.

The impacts from oil and gas development would be similar to those identified under Alternative 1, except that the impacts would be reduced by more constraint. The constraints would maintain the recreational settings, opportunities, and experiences of the Pedro Mountain SRMA.

OHV management actions would not allow off-road OHV use for "necessary tasks," big game retrieval, and to access primitive camping sites. Not permitting offroad OHV use would benefit recreationists seeking solitude and activities away from OHV activities, but it would also limit opportunities for those who use OHV for access opportunities, potentially displacing them to alternative areas.

The SRMA management action would open lands to oil and gas leasing with an NSO stipulation. Existing oil and gas leases would be intensively managed. The SRMA would be closed to locatable mineral entry, mineral material disposals, and land tenure adjustments, including sale. Withdrawals would be pursued. This would have a long-term benefit to recreation because the quality of the recreational setting and access would be retained, and conflicts would not occur between mineral exploration and development and recreational activities.

Summary

The Pedro Mountains would be managed as an SRMA. SRMA actions would open areas to oil and gas leases with an NSO stipulation, extensively manage existing oil and gas leases, and close public lands to locatable mineral entry and mineral material disposal. These actions would allow a higher level of recreation management for the area, preserve or improve the quality of the available recreational settings, and reduce conflicts between mineral exploration/development and recreational activities.

4.11.10.5 Impacts Under Alternative 4: Proposed Plan

The Pedro Mountains would be managed as an SRMA. Cultural, fire and fuels management, forest management, livestock grazing, paleontology, recreation resources, transportation, vegetation management, water quality, watershed and soils management, wild horse management, and wildlife and fisheries impacts would be similar to those identified in Alternative 1.

Impacts to the Pedro Mountain SRMA from visual resource management would be the same as Alternative 2.

Impacts from minerals and lands and realty management could potentially increase compared to Alternative 3. The SRMA would not be closed to locatable mineral entry or land tenure adjustments, which could decrease the quality of the recreational setting and increase potential conflicts between mineral development and recreation activities.

Impacts to the Pedro Mountains SRMA from OHV management actions would be similar to those in Alternative 1, except OHV use would be limited to 300 feet off designated roads and vehicle routes for big game retrieval and for access to primitive camping sites. The impacts would be localized to the areas surrounding the designated roads, which impact the scenic qualities and the recreation setting in the immediate areas. This action would also maintain or enhance the back country recreational setting of the Pedro Mountains SRMA by precluding OHV use beyond 300 feet from designated roads and vehicle routes.

Summary

The Pedro Mountains would be managed as an SRMA.

OHV management actions would allow OHV use 300 feet from designated roads and vehicle routes for big game retrieval and to access primitive camping sites. The impacts would be localized to the areas surrounding the designated roads, which impact the scenic qualities and the recreation setting in the immediate areas.

4.11.11 Laramie Plains Lakes SRMA

4.11.11.1 Impacts Common to All Alternatives

Air quality, forest management, minerals management, paleontology, water quality, watershed and soils, visual resource management, wild horse management, and wildlife and fisheries management would have little or no impact on Lake Hattie Reservoir and Twin Buttes Lake.

Management actions for cultural resources most often would influence the location of, but rarely preclude the development of, recreational facilities and opportunities in areas where the integrity of the setting contributes to a cultural site's NRHP eligibility. It is likely that considering the existing semi-developed nature of the area (private residences on adjacent private land and recreational facilities on public land) that locations would exist where additional facilities would not distract from the cultural setting of existing sites.

Wildland fire would be suppressed due to private lands and structures in the vicinity of the recreation sites. It is unlikely that these areas would be allowed to burn to remove decadent vegetation, encourage vegetative regeneration, or improve habitat conditions. In the long term, altered habitat would potentially affect wildlife viewing opportunities. Conversely, in the short term, fewer acres burned would leave more acreage available for quality recreational use.

Avoidance of Lake Hattie Reservoir and Twin Buttes Lake during the development of utility/transportation systems (Appendix 1) would preserve the quality of the recreational experience at these developed sites by limiting visual intrusions within the sites that detract from the rural recreation setting.

Management of livestock grazing includes meeting standards for vegetation health, wildlife habitat, and riparian habitat as required by the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997). The level of habitat quality as a result of attainment of these standards would enhance recreation opportunities by maintaining or enhancing hunting, fishing, and wildlife viewing opportunities adjacent to recreational developments. Livestock would be fenced out of the reconstructed campground at Lake Hattie Reservoir. Preventing livestock from entering the rest of the recreation sites would be problematic because of the difficulty of fencing pastures with fluctuating water levels in the lakes.

Lake Hattie Reservoir and Twin Buttes Lake would be open to oil and gas leasing with an NSO restriction on surface disturbing activities. This action would prevent the influence of oil and gas development activities and maintain the recreational setting of the area. These two recreation areas are not in an area of high or moderate oil and gas potential, so little or no oil and gas development is anticipated to occur in proximity to these recreation sites.

Restricting OHV use to existing roads within the Lake Hattie Reservoir and Twin Buttes Lake areas would limit vegetation damage and proliferation of unauthorized routes. This would indirectly contribute

to maintaining the recreation quality of these areas by maintaining the natural character of the area. OHV management actions would allow offroad OHV use for "necessary tasks," which would create contrasting linear elements to the landscape. This would degrade the scenic quality of the area and impact the natural setting. Heavy visitation and conflicts between various types of recreation, such as motorized and non-motorized users, would affect the desirability of the experience for some recreationists.

Recreation management of the SRMA would provide for visitor health and safety and for coordination with other programs. Coordination would minimize conflicts and adverse impacts on recreation opportunities and retain the quality of the recreation setting at the SRMA. Land tenure adjustments would be pursued to improve recreation opportunities. These actions would benefit the SRMA and would maintain or enhance the recreational settings, opportunities, activities, and experiences.

Impacts from other SD/MA management actions to the Laramie Plains Lakes SRMA would be negligible. Laramie Plains Lakes management actions would reclaim unnecessary or undesirable vehicle routes, which would enhance the recreational and visual settings, as well as limit certain recreational opportunities such as recreational OHV use. Reconstruction of the Lake Hattie campground would benefit the recreational setting and opportunities, as well as meet the standards for public health, safety, and accessibility.

Transportation and access management would identify roads or trails for closure, modification, or maintenance that currently contribute to resource damage or are potential hazards to the public. Numerous unauthorized two-tracks would likely be obliterated and revegetated as a result of transportation and access planning in cooperation with Wyoming Game and Fish Department (WGFD), which maintains the sites, and other stakeholders. These actions would reduce the potential for visitors trespassing on private lands and improve traffic flow, vegetative cover, public safety, and the quality of the recreational setting at the Laramie Plains Lakes.

Vegetation treatments that maintain, enhance, or restore vegetative health to meet the Wyoming Standards for Healthy Rangelands would maintain or improve the quality of the recreation setting. Improved plant vigor, density, diversity, and reduction of noxious and invasive species would improve the aesthetic appeal of treated areas as well as improve the appeal of the recreation settings.

4.11.11.2 Impacts Under Alternative 1: Continuation of Existing Management

Lake Hattie Reservoir and Twin Buttes Lake would not be managed as an SRMA.

Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on Lake Hattie Reservoir and Twin Buttes Lake.

Cultural resources, fire and fuels management, lands and realty, minerals, transportation and access management, and visual resource management would result in the same impacts as those described under Impacts Common to All Alternatives above.

Grazing systems and range improvements would be designed to achieve standards for rangeland health and desired range conditions. Grazing systems or range improvements would potentially create conflicts between livestock and recreationists and detract from the quality of the recreation experience at the lakes, particularly if the grazing systems and range improvements result in concentration of livestock on shorelines.

OHV use would be limited to existing roads and vehicle routes at Lake Hattie Reservoir and Twin Buttes Lake, which would maintain or enhance the scenic qualities, recreational opportunities, and public health and safety for the SRMA.

An NSO restriction on surface disturbing activities within recreation sites and intensive management within 1/4 mile surrounding recreation sites would minimize the sights, sounds, traffic, dust, and odors of development and be far enough away to protect the recreation experience at the sites. Closure of recreation sites to locatable mineral entry, mineral material disposals, and operation of the public land laws would protect the sites from mineral development that would otherwise potentially impair the quality of the recreation setting and detract from the recreation experience at the lakes.

Impacts from most SD/MA management actions would have negligible impacts to the Laramie Plains Lakes area. Lake Hattie Reservoir and Twin Buttes Lake lie within the Laramie Plains Lakes WHMA. WHMA management actions to pursue acquisition of lands or easements to enhance access to public lands and/or expand habitat to meet objectives of the HMA would enhance recreation opportunities by expanding the acreage available to the recreating public. The lands surrounding the Laramie Plains Lakes area would be open to locatable mineral entry, mineral material disposals, and to the operation of the public land laws. Management actions from recreation resources would maintain the scenic and recreational settings of the area.

Vegetation treatments that remove decadent vegetation would temporarily displace recreationists to alternative areas until after herbaceous revegetation occurs. The long-term effects of the vegetative treatments would be to enhance the recreational setting and experience by improving the vegetative health of the area. Chemical and biological treatments of noxious and invasive species would improve wildlife habitat to the benefit of recreationists seeking wildlife viewing opportunities.

Wildlife and fisheries actions that would maintain or improve fisheries, such as managing fish habitat to achieve PFC, are important to the quality of recreational fishing opportunities in the Laramie Plains Lakes.

Summary

Lake Hattie Reservoir and Twin Buttes Lake would not be managed as an SRMA. Grazing systems and range improvements would potentially create conflicts between livestock and recreationists and detract from the quality of the lakeside recreation experience. Recreation resource actions would protect Lake Hattie Reservoir and Twin Buttes Lake, and the 1/4 mile surrounding them, from mineral development that would otherwise potentially impair the quality of the recreation setting and detract from the recreation experience at the lakes. The Laramie Plains Lakes WHMA management actions to pursue acquisition of lands or easements to enhance access to public lands and/or expand habitat would enhance recreation opportunities by expanding the acreage available to the recreating public.

4.11.11.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Lake Hattie Reservoir and Twin Buttes Lake would not be managed as an SRMA.

Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on recreation opportunities at Lake Hattie Reservoir and Twin Buttes Lake.

Cultural resources, fire and fuels management, lands and realty, minerals, OHV management, recreation resources, SD/MAs, transportation and access management, visual resource management, and wildlife and fisheries would result in the same impacts as Alternative 1.

Livestock grazing impacts would be the same as Alternative 1, except that the design of grazing systems and range improvements that maximize livestock production while maintaining other resource values would consider the recreational setting to assure that conflicts between livestock and the public are minimized and the quality of the recreational experience at the lakes is not adversely affected.

Impacts from the Laramie Plains Lakes WHMA would be similar as those described in Alternative 1, with the exception that WHMA management actions would not pursue acquisition of lands or easements to meet objectives of the WHMA. This would limit additional recreational opportunities surrounding the area.

Vegetation treatments that meet standards would benefit recreation settings by reducing weed infestations and keeping the vegetation natural in the Lake Hattie Reservoir and Twin Buttes Lake area. Vegetation treatments applied to increase forage and meet standards for rangeland health and watershed function would enhance the recreational experience by reducing erosion and sedimentation and improving ground cover and the vegetative health of the area.

Summary

Lake Hattie Reservoir and Twin Buttes Lake would not be managed as an SRMA. Grazing systems and range improvements designed taking into consideration recreation resources would reduce conflicts between livestock and recreationists that could detract from the quality of the recreation experience at the lakes. Recreation resource actions would protect Lake Hattie Reservoir and Twin Buttes Lake, and the 1/4 mile surrounding them, from mineral development that would otherwise potentially impair the quality of the recreation setting and detract from the recreation experience at the lakes.

4.11.11.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on the Laramie Plains Lakes SRMA.

Cultural resources, fire and fuels management, lands and realty, minerals, transportation and access management, visual resource management, and wildlife and fisheries would result in the same impacts as Alternative 1.

Livestock grazing impacts would be the same as Alternative 1, except that grazing systems and range improvements designed to enhance wildlife, watershed, and riparian values while reducing livestock conflicts with other resources would improve the naturalness and quality of the recreation setting in the SRMA. Livestock would likely be fenced out of the recreation sites to reduce conflicts with recreationists and impacts to water quality in the lakes. Fences or other livestock management facilities would be located where they would cause the least disruption to public use of the recreation sites.

OHV use would be limited to designated roads or vehicle routes, which would maintain or enhance the recreational settings by doing away with unnecessary or undesirable vehicle routes. This action would also create additional non-motorized opportunities within the SRMA.

Lake Hattie Reservoir and Twin Buttes Lake and lands within a 1/2 mile of them would be protected by an NSO restriction on surface disturbing and disruptive activities and closures to locatable mineral entry,

mineral material disposal, and land tenure adjustments. Because the SRMA is located in an area of low oil and gas potential, little oil and gas development is anticipated. Above-ground facilities and linear utilities would be avoided unless mitigated to protect recreation site viewsheds. These actions would prevent a loss of public access and industrialization of the recreation setting by limiting the sights, sounds, traffic, and odors of oil and gas or mineral development to areas far enough away to protect the recreation experience at the sites.

Lake Hattie Reservoir and Twin Buttes Lake would be managed as the Laramie Plains Lakes SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Albany County. The primary activity at these sites would be fishing in a front country setting.

The Laramie Plains Lakes would be managed as an ACEC. Acquisition of lands or easements for access to public lands and/or to expand habitat would add to the acreage available to the recreating public. Livestock grazing management that meets ACEC objectives would maintain, restore, or protect potential habitat for the endangered Wyoming toad, also thereby improving the vegetative health and aesthetic qualities of the SRMA. Prohibition of offroad motor vehicle use for “necessary tasks” would prevent habitat fragmentation, the linear visual intrusion of new two-tracks, and the loss of fragile soils and vegetation. ACEC actions to maintain water quality and wildlife habitat would improve fishing, wildlife viewing, and other wildlife-related recreation opportunities in the SRMA.

Control of noxious and invasive species to maintain or restore native weed-free communities would maintain or improve the recreation setting by ensuring a more natural native vegetation complex that would enhance the recreational setting and experiences.

Summary

Lake Hattie Reservoir and Twin Buttes Lake would be managed as the Laramie Plains Lakes SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Albany County. Management actions for the Laramie Plains Lakes ACEC and SRMA would protect the integrity of the SRMA and the quality of the recreation experience.

4.11.11.5 Impacts Under Alternative 4: Proposed Plan

Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on the Laramie Plains Lakes SRMA.

Cultural resources, fire and fuels management, lands and realty, minerals, transportation and access management, vegetation, visual resource management, and wildlife and fisheries would result in the same impacts as Alternative 1. OHV management and the Laramie Plains Lakes SRMA would result in the same impacts as Alternative 3.

Livestock grazing impacts would be the same as Alternative 1, except that grazing systems and range improvements would be designed to achieve and maintain healthy rangelands and achieve allotment objectives. Livestock would likely be fenced out of the recreation sites to reduce conflicts with recreationists and impacts to water quality in the lakes. Maintenance or improvement of range conditions would improve vegetative health and ecosystem function, thereby maintaining or improving the natural appearance and desirability of recreation settings.

Lake Hattie Reservoir and Twin Buttes Lake and lands within 1/4 mile of them would be protected by an NSO restriction on surface disturbing and disruptive activities. They would also be protected by closures to locatable mineral entry, mineral material disposal, and land tenure adjustments. Little oil and gas development is anticipated due to the SRMA's location in an area of low oil and gas potential. Above-ground facilities and linear utilities would be avoided unless mitigated to protect recreation site viewsheds. These actions would prevent or minimize a loss of public access and industrialization of the recreation setting by locating the sights, sounds, traffic, and odors of oil and gas or mineral development far enough away to protect the recreation experience at the sites.

Lake Hattie Reservoir and Twin Buttes Lake would be managed as the Laramie Plains Lakes SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Albany County. The primary activity at these sites would be fishing in a front country setting.

The Laramie Plains Lakes would be managed as a WHMA. Management actions to pursue acquisition of lands or easements to enhance access to public lands and/or expand habitat to meet objectives of the HMA would enhance recreation opportunities by expanding the acreage available to the recreating public. The prohibition of offroad motor vehicle use for "necessary tasks" would prevent habitat fragmentation, the linear visual intrusions of new two-tracks, and the loss of fragile soils and vegetation, thereby preserving the rural character of the recreational setting in the SRMA.

Summary

Lake Hattie Reservoir and Twin Buttes Lake would be managed as the Laramie Plains Lakes SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Albany County. Grazing systems and range improvements would be designed to achieve and maintain healthy rangelands and improve vegetative health and ecosystem function, thereby maintaining or improving the natural appearance and desirability of recreation settings. Recreation resources and SRMA and WHMA restrictions on surface disturbing activities would maintain public access and prevent or minimize industrialization of the recreation setting. The sights, sounds, traffic, and odors of development would be located far enough away to protect the recreation experience and rural setting at the sites.

4.11.12 Rawlins Fishing SRMA

4.11.12.1 Impacts Common to All Alternatives

Forest management, minerals management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on Rim Lake and Teton Reservoir recreation sites.

Management actions for cultural resources would most often influence the location of, but rarely preclude, the development of recreational facilities and opportunities in areas where the integrity of the setting contributes to a cultural site's NRHP eligibility. It is likely that, considering the existing semi-developed nature of the area, locations would exist where additional facilities would not distract from the cultural setting of existing sites.

Fuel treatments, including prescribed fire, mechanical, chemical and biological treatments, would be used for fuels reduction and to meet other multiple-use resource objectives. Because of the U.P.R.R. checkerboard land pattern around Rim Lake and Teton Reservoir, wildland fire would be suppressed, regardless of ignition source, to limit the acreage burned by wildland fire. Therefore, fewer acres would

be allowed to burn in prescription to remove decadent vegetation and improve habitat conditions. In the long term, poorer habitat would offer fewer wildlife viewing and hunting opportunities. Conversely, in the short term, fewer acres burned would leave more acres available for recreational use.

Rehabilitation and restoration efforts specific to a fire event would be undertaken to protect and sustain ecosystems, public health and safety, and to help communities protect infrastructure. These actions would temporarily reduce the acreage available for recreational use, but over the longer term they would rejuvenate vegetative cover and improve wildlife-related recreation opportunities.

Temporary road and vehicle route closures during and after fire events would displace recreationists to other parts of the RMPPA. Burned areas would be undesirable places to recreate until reclamation is successful. Displacement would be longer term if catastrophic fires sterilized soils and delayed revegetation in areas that are popular for recreation activities.

Avoidance of Rim Lake and Teton Reservoir during the development of utility/transportation systems (Table 2-5) would preserve the quality of the recreational experience at these developed sites by limiting visual intrusions within the sites that detract from the rural recreation setting.

Potential wind power development on ridges surrounding the lakes would detract from the quality of the recreational setting by creating new visual intrusions on the horizon if turbines and access roads were visible from Rim Lake or Teton Reservoir recreation site.

Livestock use is excluded from the Teton Reservoir recreation site and therefore has minimal impact to the site. Management of livestock grazing at the Rim Lake recreation site includes meeting standards for vegetation health, wildlife habitat, and riparian habitat as required by the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997). The level of habitat quality as a result of attainment of these standards would enhance recreation opportunities by maintaining or improving hunting, fishing, and wildlife viewing values adjacent to recreational developments. A new fence constructed south of the Rim Lake recreation site is intended to implement a grazing plan for the Sixteen Mile allotment, with an emphasis on fall or winter grazing to reduce conflicts with recreationists and reduce detrimental effects upon water quality in the lake.

Rim Lake and Teton Reservoir recreation sites would be open to oil and gas leasing with an NSO restriction on surface disturbing activities. These two recreation areas are not in an area of high or moderate oil and gas potential, so little or no oil and gas development is anticipated near these recreation sites.

Reconstruction of Teton Reservoir recreation site would improve accessibility and the aesthetic appeal of the site. Dredging to deepen the reservoir would improve the viability of the fishery. Reclamation of unnecessary or undesirable vehicle routes would reduce erosion and sedimentation, improve vegetative cover, and improve the visual quality of the recreation sites.

Maintenance, modification, or closure of existing roads and vehicle routes that currently contribute to resource damage or are potential hazards to the public would improve vegetative cover, reduce sedimentation in the lakes, and improve the overall quality of the recreational setting at Rim Lake and Teton Reservoir recreation sites. Maintenance of an adequate network of properly designed roads would improve public safety. Numerous unauthorized two-tracks would likely be done away with and revegetated as a result of transportation and access planning in cooperation with stakeholders. Implementation of the RFO Transportation Plan would reduce the potential for visitors to trespass on adjacent private lands.

Vegetation treatments that maintain, enhance, or restore vegetative health and meet the Wyoming Standards for Healthy Rangelands would maintain or improve the quality of the recreation setting. Improved plant vigor, density, and diversity, as well as the reduction of noxious and invasive species, would improve the aesthetic appeal of treated areas and improve the appeal of the recreation settings.

Rim Lake and Teton Reservoir recreation sites would be located in a VRM Management Class III area. VRM Class III management allows for modification of the natural environment so long as it does not dominate the view of the casual observer. Further recreational development at these sites would be compatible with VRM Class III objectives and VRM management actions would have little or no impact on recreational opportunities at these two recreation sites.

4.11.12.2 Impacts Under Alternative 1: Continuation of Existing Management

Rim Lake and Teton Reservoir recreation sites would not be managed as an SRMA. Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on Rim Lake and Teton Reservoir recreation sites.

Cultural resources, fire and fuels management, lands and realty, minerals, transportation and access management, and visual resource management would result in the same impacts as those described under Impacts Common to All Alternatives above.

An NSO restriction on surface disturbing activities within recreation sites and intensive management within 1/4 mile of the surrounding recreation sites would locate the sights, sounds, traffic, dust, and odors of development far enough away to protect the recreation experience at the sites. Closure of recreation sites to locatable mineral entry, mineral material disposals, and operation of the public land laws would protect the sites from mineral development that would otherwise potentially impair the quality of the recreation setting and detract from the recreation experience at the lakes.

Intensive management of surface disturbing and disruptive activities within the sites would locate the sights, sounds, traffic, dust, and odors of development outside the recreation sites. Opening the sites to locatable mineral entry and mineral material disposals would potentially impair the quality of the recreation setting and detract from the recreation experience at the lakes.

Vegetation treatments that remove decadent vegetation would displace recreationists from treated areas to other more desirable areas until after herbaceous vegetation recovers. The long-term effects of the vegetative treatments would be to enhance the recreational experience by improving the vegetative health of the area. Treatment of noxious and invasive species would improve wildlife habitat to the benefit of recreationists seeking wildlife viewing opportunities.

Fisheries actions, such as managing fish habitat to achieve PFC, that would maintain or improve fisheries are important to the quality of recreational fishing opportunities. Fishing is one of the most popular recreation activities in southern Wyoming. Rim Lake and Teton Reservoir recreation sites include fishing as a primary activity. Visitation declines when water levels are low or when winter kill occurs because of low water levels. Visitors are less likely to return to a fishery if they are repeatedly unsuccessful at catching fish, and therefore the productivity of a fishery is a large determinant of the desirability of a recreation setting for fishermen.

Summary

Grazing systems and range improvements designed with consideration for recreation resources would reduce conflicts between livestock and recreationists that could detract from the quality of the recreation

experience at the sites. Because little or no oil and gas development is expected to occur in proximity to Rim Lake and Teton Reservoir recreation sites and there would be an NSO restriction on surface disturbing activities within recreation sites, no impacts to the integrity of the sites or the quality of the recreation experience from oil and gas development are anticipated. Rim Lake and Teton Reservoir recreation sites would not be managed as an SRMA so there would be no formal coordination in managing the two sites.

4.11.12.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Rim Lake and Teton Reservoir recreation sites would not be managed as an SRMA. Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on Rim Lake and Teton Reservoir recreation opportunities.

Cultural resources, fire and fuels management, lands and realty, livestock grazing, minerals, OHV management, recreation resources, transportation and access management, visual resource management, and wildlife and fisheries would result in the same impacts as Alterative 1.

Summary

The quality of wildlife habitat and rangelands would be degraded by vegetation loss, erosion, and sedimentation resulting from unauthorized vehicle route proliferation that would most likely continue to occur and detract from the visual and aesthetic quality of the recreational setting. Surface occupancy and use restrictions that protect Rim Lake and Teton Reservoir recreation sites and the 1/4 mile surrounding the sites from mineral development would preclude activities and facilities that impair the quality of the recreation setting and detract from the recreation experience at the lakes.

4.11.12.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Rim Lake and Teton Reservoir recreation sites would be managed as the Rawlins Fishing SRMA. Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on Rim Lake and Teton Reservoir recreation opportunities.

Cultural resources, fire and fuels management, lands and realty, livestock grazing, minerals, OHV management, recreation resources, transportation and access management, visual resource management, and wildlife and fisheries would result in the same impacts as Alternative 1.

Rim Lake and Teton Reservoir recreation sites and lands within 1/2 mile of them would be protected by an NSO restriction on surface disturbing and disruptive activities as well as closures to locatable mineral entry, mineral material disposal, and land tenure adjustments. Because the SRMA is located in an area of low oil and gas potential, little oil and gas development is anticipated. Above-ground facilities and linear utilities would be avoided unless adequately mitigated to protect recreation site viewsheds. These actions would prevent a loss of public access and industrialization of the recreation setting by locating the sights, sounds, traffic and odors of oil and gas or mineral development far enough away to protect the recreation experience at the sites.

Rim Lake and Teton Reservoir recreation sites would be managed as the Rawlins Fishing SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Carbon County. The primary activity at these sites would be fishing in a front country setting within 15 miles of Rawlins.

Summary

Rim Lake and Teton Reservoir recreation sites would be managed as an SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of front country recreation opportunities available in Carbon County. Management actions for the Rawlins Fishing SRMA would protect the quality of the recreation settings and experiences provided.

4.11.12.5 Impacts Under Alternative 4: Proposed Plan

Rim Lake and Teton Reservoir recreation sites would be managed as the Rawlins Fishing SRMA. Forest management, paleontology, water quality, watershed and soils management, and wild horse management would have little or no impact on the Rawlins Fishing SRMA.

Cultural resources, fire and fuels management, lands and realty, livestock grazing, minerals, transportation and access management, vegetation, visual resource management, and wildlife and fisheries would result in the same impacts as Alterative 1.

Rim Lake and Teton Reservoir recreation sites and lands within 1/4 mile of them would be protected by an NSO restriction on surface disturbing and disruptive activities and closures to locatable mineral entry, mineral material disposal, and land tenure adjustments. Because of the SRMA's location in an area of low oil and gas potential, little oil and gas development is anticipated.

Livestock management actions would help achieve the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997), which would enhance recreation opportunities by maintaining the setting, opportunities, and experiences in the Shirley Mountain SRMA. In many cases, the promotion of shorter duration of livestock use and manipulation of the season of use would incorporate timing of recreation in order to reduce livestock management impacts upon the recreation experience. The presence of livestock in a landscape setting is probably not detrimental to the experience of most recreationists. However, on a site-specific level, recreationists would potentially be displaced in response to water quality issues and the presence of livestock. In some cases when livestock use is high, bacteria such as Escherichia coli would impact the recreational experiences and activities for portions of the year. The proximity to livestock and concern over their behavior would influence recreationists' safety or purpose for being. This would result in a less enjoyable experience and would potentially displace recreationists to another location or time of year when livestock are not present.

Above-ground facilities and linear utilities would be avoided unless adequately mitigated to protect the recreation site viewsheds. These actions would prevent a loss of public access and industrialization of the recreation setting by locating the sights, sounds, traffic, and odors of oil and gas or mineral development far enough away to protect the recreation experience at the sites.

Rim Lake and Teton Reservoir recreation sites would be managed as the Rawlins Fishing SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Carbon County. The primary activity at these sites would be fishing in a front country setting.

Summary

Rim Lake and Teton Reservoir recreation sites would be managed as the Rawlins Fishing SRMA to facilitate better coordination in managing the two sites for the community recreation-tourism market and to preserve or improve the quality of recreation opportunities available in Carbon County. Grazing

systems and range improvements designed to achieve and maintain healthy rangelands would improve vegetative health and ecosystem function, thereby maintaining or improving the natural appearance and desirability of recreation settings. Recreation resources and SRMA restrictions on surface disturbing activities would prevent industrialization of the recreation setting and would also locate the sights, sounds, traffic, and odors of development far enough away to protect the recreation experience and front country setting at the sites.

4.11.13 Shirley Mountain SRMA

4.11.13.1 Impacts Common to All Alternatives

The Shirley Mountain SRMA (24,440 acres, Map 2-14) would be managed for recreation. No impacts would be expected to occur to the Shirley Mountain SRMA from management actions associated with air quality management, cultural resources, livestock management, paleontology, recreation management, SD/MAs, WSAs, WSRs, other SD/MAS, water quality, watershed and soils, wild horse management, and wildlife and fisheries management.

Forest management actions would allow non-commercial harvest of minor wood products and manipulate aspen, juniper, and other tree species to meet forest health and/or other resource objectives. This would reduce the probability of catastrophic fires that would reduce recreation opportunities for extended time periods.

Designation of ROW corridors—which would include powerlines, telephone lines, fiber optic lines, pipelines, and other linear type ROWs outside of the Shirley Mountain SRMA (Table 2-3)—would ensure protection of the wildlife habitat and recreational opportunities of the area by eliminating the potential for surface disturbance from these actions.

Lands and realty access acquisitions and land tenure adjustments would facilitate greater recreational access and reduce conflicts between recreationists and private landowners by consolidating public lands. Management actions to consider acquisition of private inholdings in the SRMA would potentially improve public access to parts of Shirley Mountain that currently have limited public access. Acquisition of these inholdings would make it easier to manage habitat and visual resources in the SRMA. BLM management actions would apply to the acquired portions, providing additional measures to maintain or enhance the recreational opportunities of the SRMA.

Some direct, short-term effects of OHV use are noise, congestion, and decreased air quality. This would diminish the recreational experience and setting for those who seek solitude and natural settings for camping, hiking, and recreational activities in the SRMA. Travel off existing roads for “necessary tasks” would potentially generate new vehicle routes.

Shirley Mountain SRMA management actions would include the development of primitive camping sites to encourage dispersion of campers and hunters. Motorized travel would be limited to designated roads or vehicle routes to allow unnecessary or undesirable routes to revegetate. Travel management would facilitate public access by improving the quality of roads within the SRMA. These actions would improve the recreational opportunities and experiences by maintaining the wildlife habitat and visual qualities of the SRMA.

Transportation and access management would potentially acquire legal public access to increase recreational opportunities on the public lands. Road densities would not be restricted for surface disturbing and disruptive activities, which would potentially increase recreation access opportunities. This

would also fragment habitat, create visual intrusions, introduce noise and dust associated with vehicle traffic into new areas, create erosion, and generally alter the character of the SRMA.

Managing vegetation to meet the Wyoming Standards for Healthy Rangelands and the potential use of all forms of control of noxious and invasive species would help maintain, enhance, or restore vegetative health in the SRMA. Vegetation treatments would have short-term impacts on the SRMA by reducing vegetation cover and increasing soil erosion. However, over the long term, vegetation treatments would enhance plant vigor, vegetation cover, and species diversity. Any vegetation treatment would be designed to increase or improve forage and habitat for wildlife species and to maintain the plant communities.

4.11.13.2 Impacts Under Alternative 1: Continuation of Existing Management

No impacts would be expected to the Shirley Mountain SRMA from management actions associated with air quality management, cultural resources, fire and fuels management, OHV management, paleontology, recreation management, SD/MAs, WSAs, WSRs, other SD/MAS, transportation and access management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management.

Forest management would use a number of forest health management treatments for forest health (Appendix 19). Timber harvesting (28,500 commercial acres available in the Shirley Mountain area) would displace recreationists and cause a loss of recreational opportunities in timbered areas during logging operations and until revegetation is sufficient to make these areas desirable recreation settings again. Timber harvesting methods, such as select cuts or clearcuts, would increase the vegetation mosaic, alter habitat conditions, and potentially increase the number of wildlife species using these localized areas. This would, in turn, alter the recreational setting for some activities such as wildlife viewing. In the short term, forest health management treatments would increase dispersed recreation opportunities and alter the setting in these treated areas. In the long term, the recreation setting and opportunities for diverse recreation would be improved.

Shirley Mountain SRMA has excellent potential for wind energy development, but would be an avoidance area. Constructing wind energy facilities in the Shirley Mountain SRMA will be foreseeable only if there are no other feasible locations available for wind energy. In the remote scenario of locating wind energy facilities in this area, the potential exists for birds and bats to collide with operating wind turbine towers and blades, meteorological towers, and guy wires. Increased traffic associated with wind energy development would increase the potential for conflicts between terrestrial species and vehicles. The settings of the immediate areas where the proposed wind energy projects will occur will be altered from middle country to rural through the removal of forest and construction of wind towers, roads, electrical lines, and associated facilities. The settings of the surrounding areas will not be affected and will remain back country to middle country. Intensive management within the area would reduce these impacts through mitigation measures and BMPs (Appendix 15). Intensive management would help reduce disturbance of wildlife habitat.

Livestock management actions would help maintain existing roads and vehicle routes, which would improve recreational access to some areas within the SRMA. New fences would have an adequate number and location of gates to meet the needs of livestock management and other resource values and actions, including recreation management and SRMA management actions. In some instances gates would not be placed on every existing road crossing, where the SRMA management actions or another program would benefit from a road or trail closure, for the protection or enhancement of resource values. Construction of larger reservoirs capable of creating new fishery resources would increase the number of sites for recreational fishing and result in wider distribution of this use and potentially more favorable experiences it. Conversions from cattle or sheep to domestic bison would increase safety concerns of recreationists

caused by potential confrontations with bison. However, this is a discretionary action authorized by the field manager in which effects on other resource values would be taken into account prior to approval.

Minerals management actions would potentially allow surface disturbance and visual intrusions in the Shirley Mountain SRMA because the area would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. Shirley Mountain is in an area of low oil and gas potential and is not currently leased. Therefore, development is unlikely. The SRMA would also be open to locatable mineral entry, although the likelihood of locatable mineral entry is low based on reasonably foreseeable development; therefore the potential for impacts would be minimal. The potential for mineral material disposals is higher. However these actions are discretionary and would not be approved within high-value areas of the SRMA. Therefore, the impacts associated with these types of actions would also be minimal.

Vegetation management actions would result in weed treatments within the SRMA. However, the focus of treatments to eliminate small and control large infestations would allow large patches of weeds to remain in the SRMA, potentially degrading the recreational experience.

The Shirley Mountain SRMA would be VRM Class II. The VRM Class II designation would limit visual intrusions to retain the recreational setting. Management activities within VRM Class II areas would require the application of BMPs to ensure developments do not attract the attention of recreationists and maintain the basic elements found in the natural features of the SRMA (Appendix 25).

Summary

Surface disturbance, route proliferation, noise, dust, visual intrusions, and traffic associated with forest management actions and wind energy development would potentially reduce the acreage and quality of recreational opportunities available. Some recreationists would be displaced from harvested and developed areas because such areas would potentially be less desirable recreation settings. The focus of vegetation treatments to eliminate small and control large infestations of weeds would allow large patches to remain in the SRMA, potentially degrading the recreational experience.

4.11.13.3 Impacts Under Alternative 2: Emphasis on Development of Resources

No impacts would be expected to the Shirley Mountain area from management actions associated with air quality management, cultural resources, fire and fuels management, OHV management, paleontology, recreation management, SD/MAs, WSAs, WSRs, other SD/MAS, transportation and access management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management.

The Shirley Mountain area would not be managed as an SRMA but would still be managed for recreation. Impacts from livestock management, and minerals development would be the same as those described in Alternative 1.

Shirley Mountain SRMA has excellent potential for wind energy development and would not be managed as an avoidance area. The potential exists for birds and bats to collide with operating wind turbine towers and blades, meteorological towers, and guy wires. Increased traffic associated with wind energy development would increase the potential for conflicts between terrestrial species and vehicles. Development of wind energy would require close spacing of turbines which would result in clear cut areas, displacement of wildlife, and reduced recreational opportunities. The setting of the SRMA would be severely degraded through the removal of forest and the construction of wind towers, roads, electrical lines, and associated facilities. Increased traffic associated with wind energy would degrade the

recreational experience for those seeking solitude and primitive settings. Intensive management within the area would reduce these impacts through mitigation measures and BMPs (Appendix 15).

With priority for controlling noxious and invasive species concentrated in areas where commodity benefits would be enhanced, vegetation management would benefit recreation. Weed control would improve the aesthetic appeal of the recreational setting.

The Shirley Mountain area would be Class III VRM because Class II is difficult to manage in mixed land ownership and BLM has no authority over actions on private lands. Developments would be managed to conform to Class III objectives, which would maintain the recreational setting of the area.

Summary

Shirley Mountain would not be managed as an SRMA. Control of noxious and invasive species would improve the aesthetics of the recreational setting. The Shirley Mountain area would be managed for VRM Class III to better accommodate the land ownership pattern.

4.11.13.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Shirley Mountain would be managed as an SRMA. No impacts would be expected from management actions associated with air quality management, cultural resources, fire and fuels management, OHV management, paleontology, recreation management, SD/MAs, WSAs, WSRs, other SD/MAS, transportation and access management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management.

VRM management in the Shirley Mountain SRMA would have the same impacts as Alternative 2.

Forest management actions would allow non-commercial harvest of minor wood products and manipulate aspen, juniper, and other tree species to meet forest health and/or other resource objectives. This would reduce the probability of catastrophic fires that would reduce recreation opportunities for extended time periods. Commercial timber harvest would not be permitted thereby reducing conflicts between harvesting and recreational activities. However, detrimental impacts to huntable wildlife populations could result as the forest health declines, which would negatively impact the recreational experiences in the SRMA. Declining forest health would also negatively impact visual resources, further negatively impacting the value and the settings of the SRMA.

Lands and realty management actions would co-locate communication sites and limit new cell towers or communication sites to existing, designated communications sites. There is currently a communication site consisting of two towers on top of the Shirley Mountains and is incorporated into the current recreational setting. The scenic and recreational settings immediately surrounding the site would be altered from a middle country setting to a more rural setting, but the lands peripherally surrounding the site would not be impacted. These actions would maintain the recreational settings and activities in the Shirley Mountain SRMA.

The Shirley Mountain SRMA would be expanded to include 13,380 additional acres. Although the SRMA would be open to oil and gas development, new leases would have an NSO stipulation. Because this area is currently not leased, this stipulation would apply to all future leases. This would have a long-term benefit to recreation because the quality of the recreational setting would not be diminished by oil and gas development, and conflicts would not occur between industry and recreationists.

Impacts from livestock grazing management actions would be similar to those under Alternative 1, except grazing systems and range improvements would be implemented to enhance wildlife, watershed, and riparian values. These systems and improvements would improve water quality and wildlife habitat, which would improve recreational settings within the Shirley Mountain SRMA. Conversions from cattle or sheep to domestic bison would not occur in areas of blocked federal surface land ownership, which would reduce safety concerns of recreationists caused by potential confrontations with bison.

Vegetation management priorities for noxious and invasive species control to maintain or restore native weed-free communities would maintain or improve the recreation setting by keeping it natural and eliminating infestations of species that recreationists find unpleasant, such as Canada thistle.

Summary

Impacts to the expanded SRMA would be reduced as compared to the other alternatives. The closure to commercial timber harvest would help preserve the recreation setting in the SRMA. Minerals management actions would have a long-term benefit to recreation because the quality of the recreational setting would not be diminished by oil and gas development. The Shirley Mountain area would be managed for VRM Class III to better accommodate the land ownership pattern.

4.11.13.5 Impacts Under Alternative 4: Proposed Plan

The Shirley Mountain would be managed as an SRMA. No impacts would be expected from management actions associated with air quality management, cultural resources, fire and fuels management, OHV management, paleontology, recreation management, SD/MAs, WSAs, WSRs, other SD/MAS, transportation and access management, water quality, watershed and soils, wild horse management, and wildlife and fisheries management.

Lands and realty management actions for wind energy development and vegetation management actions would have the same impacts as Alternative 1.

Impacts from livestock management would be similar to those identified under Alternative 3.

Impacts from VRM would be similar to those identified under Alternative 2.

Impacts on the SRMA from forest management would be similar to those identified under Alternative 1, except that approximately 6,700 acres in riparian corridors, steep slopes, and other sensitive areas would not be available for commercial timber harvest.

Management actions for the Shirley Mountain SRMA would have the same impacts as Alternative 3.

Summary

The Shirley Mountain SRMA would be expanded to include 13,380 additional acres over Alternative 1. Surface disturbance, route proliferation, noise, dust, visual intrusions, and traffic associated with forest management actions and wind energy development would potentially reduce the acreage and quality of recreational opportunities available. The focus of vegetation treatments to eliminate small and control large infestations of weeds would allow large patches to remain in the SRMA, potentially degrading the recreational experience. Minerals management actions would have a long-term benefit to recreation because the quality of the recreational setting would not be diminished by oil and gas development. The Shirley Mountain area would be managed for VRM Class III to better accommodate the land ownership pattern.

4.12 SOCIOECONOMICS

Socioeconomic impacts would occur with the implementation of any of the alternatives. Potential impacts include changes in employment and income; changes in tax revenue for local, state, and federal government entities; and changes in demand for housing and government services. In addition, management actions could alter the attitudes and opinions concerning use of public lands. Many of the impacts predicted under Alternatives 2, 3, and 4 would also occur under Alternative 1. This is because some level of development of mineral resources is occurring, and would continue to occur, under Alternative 1. Thus, current impacts would be perpetuated into the future.

The pace and timing of mineral development activities depend on various factors beyond the management decisions of BLM. These factors include national and international energy demand and prices, production factors within the RMPPA, and the business strategies of operators. Because the pace of development in the RMPPA is unknown, a relatively constant rate of development is assumed for this analysis. Therefore, actual impacts could vary if the rate of production changed over the study period.

This section describes potential impacts on socioeconomics from management actions. Existing conditions concerning socioeconomics are described in Section 3.12.

Significance Criteria

Impacts on socioeconomic resources would be considered potentially significant if any of the following occurred:

- Changes in total employment in Albany, Carbon, Laramie, and Sweetwater Counties exceeded an increase or decrease of 1 percent of the trend.
- Changes in local tax revenues exceeded an increase or decrease of 15 percent of the trend.

See Appendix 35 for more details on significance criteria.

Methods of Analysis

The potential economic impacts of alternatives associated with the RMPPA were estimated using the IMPLAN (IMPLAN 2000) computer model. IMPLAN is a regional economic impact model that provides a mathematical account of the flow of dollars and commodities through a region's economy. This model provides estimates of how a given amount of a particular economic activity translates into jobs and income in the region.

All data used with the IMPLAN model were adjusted for inflation before calculations were performed. Once the calculations were complete, dollar values were converted to constant 2002 dollars for the 20-year study period (2004–2023) and discounted using a 7-percent real discount rate as recommended by the Office of Management and Budget (OMB 2003). (OMB recommends using a real discount rate of 7 percent for constant-dollar benefit-cost analysis, which approximates the marginal pretax rate of return on an average investment in the private sector in recent years.)

The IMPLAN model requires a series of inputs and assumptions specific to the study area. This includes the value of production resulting from land uses within the RMPPA under each alternative. Information from BLM staff regarding current uses and how these uses might change under each alternative provided a physical, quantitative measure of the inputs necessary for the economic impact analysis (e.g., number of

gas wells, AUMs, recreational visitor days). Table 4-2 summarizes the primary data and sources used to estimate physical inputs for the IMPLAN model.

Table 4-2. Primary Inputs for Socioeconomic Analysis

Use	Primary Data Inputs	Data Source
Oil and Gas Exploration and Development	(1) Historical production, (2) historical and forecasted prices, (3) development cost estimates, (4) reasonably foreseeable development scenario	(1) WY Geological Survey (2) U.S. Department of Energy (3) Interviews with local oil and gas companies (4) BLM
Grazing	(1) Historical AUMs for cattle and sheep within RMPPA and (2) historical cattle and sheep prices (1996–2001)	(1) BLM (2) WY Agriculture Statistics
Recreation	(1) Estimated recreational visitor days per recreational activity and (2) estimated recreational expenditures per activity	(1) BLM RMIS Database, WY Game and Fish (2) WY Game and Fish, WY Tourism Board, Colorado OHV Coalition

The estimated inputs and prices were used to evaluate the potential sales from uses within the RMPPA under each alternative. This is the direct sales estimate that serves as the input into the IMPLAN model to obtain an estimate of total economic impact of each alternative (changes in direct, indirect, and induced income and employment).

Changes in employment and income cause other socioeconomic impacts, such as changes in population, which can lead to other community impacts on housing, infrastructure, government services, and quality of life issues. The changes in employment and income have been used to qualitatively assess other impacts in the socioeconomic region of influence (ROI).

Mineral production in the study area is the largest source of tax revenue for government entities within the study area. The analysis will assess any changes in tax revenues related to changes in oil, gas, and coal development within the RMPPA.

The analysis is based on the following assumptions:

- Economic benefits to the socioeconomic ROI would accrue from BLM-influenced activities, such as oil and gas development, livestock grazing, and recreation.
- Employment and income would continue to be a driver of economic and population growth in the ROI.
- Housing supply and costs, and community infrastructure and services, might serve as constraints to population growth in the RMPPA vicinity.
- Tax revenues derived from activities on BLM lands would continue to have fiscal implications for communities within the ROI.

- Activities and resources available in and around the RMPPA would continue to be important to the quality of life of current and future residents.
- An estimate of future oil and gas exploration and development was taken from the Reasonably Foreseeable Development Report.
- An estimate of coal exploration and development was taken from the Reasonably Foreseeable Development Report.
- The 5-year historic average was used as a basis for the grazing assumptions used under each alternative.
- Recreational use, by alternative, was estimated from the data in the BLM RMIS database and the Wyoming Game and Fish Department.
- The assessment of mineral tax revenues relied on production and assessed value estimates and effective tax rates provided by the Wyoming Department of Revenue, Mineral Tax Division.

Based on the assumptions given above, IMPLAN runs were constructed for each alternative. The results of these runs are summarized in Table 4-3.

Table 4-3 represents the sum of the federal, state, and private impacts across all alternatives for oil and gas development. Therefore, this table does not include the impacts associated with both recreation and grazing as they relate to the management alternatives. For these resources, see Figure 4-26 and Figure 4-27, which quantify the estimated impacts by alternative for both recreation and grazing.

Table 4-3. Economic Impacts of Oil and Gas Development Within the RMPPA

Alternatives/Activities	Net Present Value 2004–2023 (7%)		Employment	Average Earnings Per Job
	Average Wells Drilled Per Year/Total Value of Annual Production	Total Labor Earnings	Average Jobs Supported Per Year	
Alternative 1				
Federal				
Oil and Gas Drilling	192	$523,536,464	1,575	$31,384
Oil and Gas Production	$8,568,556,869	$520,757,339	1,351	$37,985
Total Impacts		**$1,044,293,804**	**2,926**	**$34,684**
State and Private				
Oil and Gas Drilling	256	$701,148,862	2,109	$31,385
Oil and Gas Production	$10,430,460,579	$633,915,253	1,645	$37,985
Total Impacts		**$1,335,064,116**	**3,753**	**$34,685**
Total Impacts				
Oil and Gas Drilling	447	1,224,685,326	3,683	$31,385
Oil and Gas Production	$18,999,017,448	1,154,672,593	2,996	$37,985
Total Impacts		**2,379,357,919**	**6,679**	**$34,685**

Alternatives/Activities	Net Present Value 2004–2023 (7%)		Employment	Average Earnings Per Job
	Average Wells Drilled Per Year/Total Value of Annual Production	Total Labor Earnings	Average Jobs Supported Per Year	
Alternative 2				
Federal				
Oil and Gas Drilling	204	$559,311,613	1,682	$31,385
Oil and Gas Production	$9,092,626,990	$552,607,902	1,437	$37,985
Total Impacts		**$1,111,919,515**	**3,120**	**$34,685**
State and Private				
Oil and Gas Drilling	460	$701,524,509	2,110	$31,385
Oil and Gas Production	$11,068,408,464	$672,686,781	1,750	$37,985
Total Impacts		**$1,374,211,290**	**1,930**	**$34,685**
Total Impacts				
Oil and Gas Drilling	664	$1,260,836,122	3,792	$31,385
Oil and Gas Production	$20,161,035,454	$1,225,294,684	3,187	$37,985
Total Impacts		**$2,486,130,805**	**6,979**	**$34,685**
Alternative 3				
Federal				
Oil and Gas Drilling	157	$490,953,170	1,475	$31,419
Oil and Gas Production	$7,522,716,660	$457,195,998	1,189	$37,985
Total Impacts		**$948,149,168**	**2,664**	**$34,702**
State and Private				
Oil and Gas Drilling	230	$683,419,671	2,054	$31,402
Oil and Gas Production	$9,157,364,626	$556,542,357	1,447	$37,985
Total Impacts		**$1,239,962,028**	**3,501**	**$34,693**
Total Impacts				
Oil and Gas Drilling	387	$1,174,372,840	3,529	$31,410
Oil and Gas Production	$16,680,081,285	$1,013,738,356	2,636	$37,985
Total Impacts		**$2,188,111,196**	**6,165**	**$34,697**
Proposed Plan				
Federal				
Oil and Gas Drilling	189	$751,536,828	1,552	$31,384
Oil and Gas Production	$8,903,457,113	$513,534,990	1,332	$37,985
Total Impacts		**$1,265,071,818**	**2,884**	**$34,684**
State and Private				
Oil and Gas Drilling	250	$658,905,199	1,982	$31,385
Oil and Gas Production	$10,838,132,938	$625,123,525	1,621	$37,985
Total Impacts		**$1,284,028,724**	**3,603**	**$34,685**

Alternatives/Activities	Net Present Value 2004–2023 (7%)		Employment	Average Earnings Per Job
	Average Wells Drilled Per Year/Total Value of Annual Production	Total Labor Earnings	Average Jobs Supported Per Year	
Total Impacts				
Oil and Gas Drilling	438	$1,410,442,027	3,534	$31,384
Oil and Gas Production	$19,741,590,051	$1,138,658,515	2,953	$37,985
Total Impacts		**$2,549,100,543**	**6,487**	**$34,684**

Environmental Justice

Executive Order (E.O.) 12898, Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations, requires identifying and addressing disproportionately high and adverse human health and environmental impacts of federal programs, policies, and activities on minority or low-income populations. To evaluate potential environmental justice impacts, guidance obtained from other federal agencies was reviewed, including the following:

- E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," February 11, 1994, *Federal Register*, at 7630
- U.S. Environmental Protection Agency, Interim Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analysis, Office of Federal Activities, September 30, 1997
- Council on Environmental Quality, *Environmental Justice: Guidance Under the National Environmental Policy Act*, Executive Office of the President, December 1997.

The following five-step method was used to evaluate potential environmental justice impacts associated with land management actions proposed by BLM.

- **Step 1—**Identify potential minority or low-income populations within the ROI.
- **Step 2—**Identify a broad range of potential environmental and human health effects that could affect minority or low-income populations, including safety, traffic, air quality, noise, cultural resources, hazardous waste sites and hazardous materials transport, natural resources, land use, and socioeconomics.
- **Step 3—**Assess whether the potential impacts on minority and low-income populations would be high and adverse.
- **Step 4—**Conduct extended outreach to minority and low-income populations that would experience potential high and adverse effects.
- **Step 5—**Evaluate mitigation measures that would be used to minimize adverse impacts on minority and low-income populations.

Relevant census data for counties within the ROI, including Albany, Carbon, Laramie, and Sweetwater Counties, as well as for the State of Wyoming, were collected for this analysis. This includes—

- Total population

- Percentage of population of minority status (e.g., black or African American, Hispanic or Latino, Asian American, American Indian or Alaskan Native, and Native Hawaiian and other Pacific Islander)
- Percentage of population of low-income status using annual statistical thresholds from the Bureau of the Census Current Population Reports
- Percentage of population of minority status for the entire State of Wyoming
- Percentage of population of low-income status in the entire State of Wyoming using annual statistical thresholds from the Bureau of the Census Current Population Reports.

The data listed above were then used to determine whether the populations residing within the counties in the ROI constitute an "environmental justice population" that meets any of the following criteria:

- At least one-half of the population is of minority status
- At least one-half of the population is of low-income status
- The percentage of the population that is of minority status is at least 10 percentage points higher than that for the entire Sate of Wyoming
- The percentage of the population that is of low-income status is at least 10 percentage points higher than that for the entire State of Wyoming.

4.12.1 Impacts Under Alternative 1: Continuation of Existing Management

Continuation of current management activities on BLM-administered lands would perpetuate impacts in the area that are already occurring. For instance, continued development and operation of oil and gas wells within the RMPPA would require goods and services to be purchased from various local and regional contractors and vendors. Expenditures associated with these activities, in addition to employee and contractor spending, would generate economic benefits in terms of employment and income.

Continuing current management prescriptions would also cause dissatisfaction among individuals and groups that are displaced by development activities. Some hunters and recreationists might be temporarily displaced by increases in well drilling and field development. In addition, some individuals and groups might sustain long-term impacts through loss of open landscapes and solitude related to development activities.

Impacts on Regional Employment

Management actions under the Alternative 1 would continue to influence employment in the regional economy during the study period. Under Alternative 1, activities within the RMPPA are estimated to support as many as 3,300 jobs per year over the planning period (Figure 4-26). Most of the employment would be focused on continued oil and gas operations. However, recreation activities and grazing operations also generate employment within the study area. Total employment supported by activities in the RMPPA represents approximately 3 percent of the workforce in the four-county study area.

Although the RMPPA supports a rather small percentage of total employment in the region, the impact of this employment varies throughout the study area. For instance, activities within the RMPPA are not as crucial to employment in the eastern portion of the study area, which includes the larger population

centers and diverse economies, as they are to employment in the western portions of the study area where economies are more rural in nature.

Activities in the RMPPA would have a particularly great impact on Carbon and Sweetwater Counties, the economies of which are more closely aligned with mineral production industries. It should be noted, however, that the total full-time and part-time employment for all four counties in the study region went up from 1990 to 2000. But Carbon and Sweetwater County employment fluctuated over this same time period with Carbon declining slightly (-2.02 percent) and Sweetwater showing a slight increase of 6.08 percent. Recent trends, however, have indicated that employment opportunities are again on the rise with the recent increase in oil and gas development throughout the region. Thus, proposed development on BLM-administered lands would be an important economic driver for western portions of the study area under this alternative.

Impacts on Regional Income

Land uses on BLM-administered lands would continue to be an important source of income for residents living near the RMPPA. Potential impacts on total earnings are summarized in Figure 4-27. Under Alternative 1, activities within the RMPPA would generate more than $1.3 billion in earnings over the study period. On average, activities on BLM-administered lands are estimated to provide more than $100 million in earnings per year. This equates to approximately 10 percent of total annual earnings in the study area. Earnings would be generated from continued oil and gas operations, businesses that support recreational activities, and grazing operations. Earning from uses of BLM-administered lands would be most important to western portions of the study area, which are more closely tied to mineral development, grazing, and recreational industries than are areas in the eastern portion of the study area.

Impacts on Tax Revenues

Given the importance of mineral tax revenues to local and state government entities in Wyoming, the analysis also considered changes in potential mineral revenues under each alternative. The results, summarized in Table 4-4, show the present value of total mineral revenues received as a result of gas production from 2004 through 2023. This includes federal mineral royalties, state severance taxes, and ad valorem taxes on production collected by the counties.

Table 4-4. Total Estimated Mineral Tax Royalties and Taxes from RMPPA (2001$)

Alternative	Ad Valorem	Severance	Federal Royalties	Total Mineral Revenues
Alternative 1	$587,031,762	$548,321,057	$931,694,096	$2,067,046,914
Alternative 2	$625,914,908	$584,640,127	$993,948,432	$2,204,503,467
Alternative 3	$509,939,333	$476,312,343	$808,181,208	$1,794,432,883
Proposed Plan	$578,940,074	$540,762,960	$918,891,892	$2,038,594,925

[a] Total amount for 20-year study period.

[b] This table summarizes the present value of the estimated annual flow of Ad Valorem, Severance, and mineral royalties by alternative. The real discount rate used for these calculations is 7 percent, as recommended by OMB.

Although local government entities do benefit from the mineral tax revenues collected on oil and gas production within RMPPA, the greatest impact would be attributed to changes in the ad valorem taxes that are collected by the counties. This is because local governments within the study area only receive a

percentage of federal royalties and severance taxes collected on production originating on public lands. Figure 4-28 shows the ad valorem taxes resulting each year from potential oil and gas production in the RMPPA; Figure 4-28 indicates that ad valorem taxes would be greatest for each alternative in 2010, when oil and gas production is predicted to be at its highest level.

Activities in the RMPPA under Alternative 1 would continue to generate tax revenues for local government entities. The majority of these tax revenues would be associated with oil and gas operations, which are expected to generate more than $2 billion in mineral tax revenues over the study period. Grazing and recreational activities would also generate tax revenues to government entities resulting from activities in the RMPPA.

Impacts on Population

Any population change that could be associated with implementation of alternatives under consideration in the EIS would likely be linked to employment changes. Activities within the RMPPA would continue to support as much as 3 percent of total employment in the entire four-county study area. Many of the jobs would be located in western portions of the study area and would affect communities such as Rock Springs and Rawlins, smaller communities, and unincorporated areas. Although the population has continued to fall in Sweetwater and Carbon Counties, there are now indications that a reversal of this trend might be occurring. Development activities, such as those expected to occur under Alternative 1 on BLM-administered lands, would help reverse the recent losses in population in western regions of the study area. Any increases in population are expected to be concentrated in Rock Springs and to some extent in Rawlins because of the concentration of oil and gas services companies in these two communities. However, other communities, such as Baggs and Wamsutter, as well as some unincorporated areas, might also experience changes in population. Although any increase in population would be expected to be absorbed in Rock Springs and Rawlins, small rural communities and unincorporated areas might not be able to easily absorb the population fluctuations that are expected to result from increases in employment opportunities.

Impacts on Community Services

Activities within the RMPPA could affect local government services in various ways. For instance, changes in demand for government services (e.g., roads, utilities, schools) could vary with changes in population tied to the RMPPA. As discussed above, some population changes are already occurring in parts of the study area. Several communities within the study area, including the communities of Hanna, Medicine Bow, and Encampment, are planning for these changes by making improvements to infrastructure. However, some smaller communities and unincorporated areas in the western portions of the study area might not be able to fully absorb such changes in population.

Larger communities, such as Rock Springs and Rawlins, have sufficient excess capacity in infrastructure to absorb significant increases in population. An example is associated with schools in Sweetwater County. School enrollment levels in much of Sweetwater County declined for most of the 1990s. As a result, districts within the county closed seven schools. Recently, enrollment has begun to increase with changes in population, which is benefiting these school districts. Management actions that provide employment opportunities in the study area might help stabilize populations in western portions of the study area, which could be important in connection with demand for government services.

Management of the RMPPA could also affect services through changes in tax receipts. The discussions above summarized the projected change in local governments' ad valorem tax receipts related to oil and gas development over the 20-year study period. Under this alternative, ad valorem taxes are expected to increase over time as oil and gas production increases. This increase should have a positive impact on the

local government services supported by the ad valorem tax receipts. Other types of tax receipts are not expected to be significantly affected by management activities within the RMPPA.

Changes in recreation activities could also have some impacts on local government services through changes in demand. However, significant changes in demand for recreational activities are not expected under this alternative.

Impacts on Custom, Culture, and Social Trends

Along with fish, wildlife, vegetation, and physical environment, people are an integral part of ecosystems. Lifestyles, attitudes, beliefs, values, social structure, culture, and population characteristics affect, and are affected by, land management actions, such as those by BLM within the RMPPA. In addition, RMPPA lands and BLM management of these lands have emotional meanings to many people. Residents within the RMPPA have long held opinions that there is a need to balance conservation of natural resources with the economic viability of resource-based industries. For this reason, residents generally support the development of minerals and energy as long as these activities do not damage wildlife habitat or degrade the quality of recreational experiences. Under this alternative, these attitudes and opinions would generally remain the same: some local residents would support further development activities, whereas others would be dissatisfied if development activities reduced hunting opportunities or degraded recreational activities. Other residents might be dissatisfied if areas within the RMPPA were not left in an undisturbed state.

The management of the RMPPA would not change in substantive ways under this alternative. As a result, changes in population that are occurring in some parts of the study area because of increased oil and gas development might have impacts on local customs and culture. For instance, although increased development would generate employment opportunities in the western portions of the study area, it is likely that individuals from outside the area would fill a percentage of those jobs. Employment of workers from outside the area would be attributed to the recent increase in natural gas drilling activity throughout Wyoming and the region, which has resulted in demand for skilled workers exceeding the supply. The employment of workers from outside the area, in turn, could affect the custom and culture of local areas as new persons move into the area.

Environmental Justice

The results of the socioeconomic and environmental impact analysis conducted for this project indicate that persons who reside in and around the RMPPA would sustain some adverse effects from the continued management of the RMPPA. However, any identified socioeconomic or environmental impacts from continued management of the RMPPA by BLM would not be localized or focused primarily on the identified minority or low-income populations. In other words, under any of the alternatives being considered in the EIS, these populations in the study area, as described in Chapter 3, would not be disproportionately affected compared with the general population. In addition, persons of all races and income levels were invited to participate in the public participation process for the EIS. Comments and input into the process from any minority or low-income persons were considered equally with those of all other persons. Therefore, implementation of any of the alternatives would be in compliance with E.O. 12898.

Summary

Continued management actions within the RMPPA are expected to support jobs and income in the local economy. On average, employment generated from activities within the RMPPA is expected to support approximately 3 percent of total regional employment, although most of these employment opportunities

would occur in western portions of the study area. These jobs and income levels are more important to western portions of the study area, which are more closely tied to activities within the RMPPA. Continued management actions are expected to contribute to changes in population trends and government services that have already begun to take effect. Under this alternative, existing conditions and social trends would generally remain the same, although some impacts are expected in localized areas in the western portions of the study area. Environmental justice impacts are not expected.

4.12.2 Impacts Under Alternative 2: Emphasis on Development of Resources

Management actions under Alternative 2 are expected to change activities on BLM-administered lands that could have socioeconomic impacts in the study area. Increased development and operation of oil and gas wells within the RMPPA would cause an increase in employment, which would be concentrated in western portions of the study area. Increasing employment would likely cause population pressures in localized areas. In addition, changes in management prescriptions would cause dissatisfaction among persons and groups displaced by development activities. These persons and groups include some hunters and recreationists who might be temporarily displaced by increasing well drilling and field development. Some persons and groups might also experience long-term impacts from a loss of open landscapes and solitude caused by development activities.

Impacts on Regional Employment

Activities within the RMPPA under Alternative 2 are expected to result in increases in employment relative to Alternative 1 (Figure 4-26). Over the 20-year study period, employment is expected to average 3,484 jobs per year—approximately 183 more jobs than under Alternative 1. Increased employment is expected to result from an increase in oil and gas development. However, employment associated with recreational activities is expected to decline slightly under this alternative as a result of a decline in recreational visitor days. Employment associated with grazing operations is expected to be the same as that under Alternative 1. Changes in employment associated with management of the RMPPA under this alternative are not expected to be significant for the entire four-county study area because changes in average employment would fall within the expected significance threshold. However, increases in employment might have local impacts in the western portions of the study area.

Impacts on Regional Income

Increased oil and gas drilling and production under Alternative 2 are expected to result in an increase in regional income in the study area relative to Alternative 1 (Figure 4-27). Under this alternative, the present value of regional income is expected to exceed $1.4 billion—a 6-percent increase over Alternative 1. However, a reduction in recreational visitor days is expected to decrease income to businesses by as much as $1 million over the study period under this alternative. Income associated with grazing is expected to be the same as under Alternative 1.

Impacts on Tax Revenues

Tax revenues associated with activities in the RMPPA are expected to increase under Alternative 2. This projected increase is mainly attributed to the increase in oil and gas production expected under this alternative. The total present value of mineral tax revenues is expected to exceed $2.2 billion under this alternative. This represents a 6.5-percent increase over Alternative 1. Negative impacts on tax revenues are also expected with the reduction in recreational activities under this alternative. Overall changes in ad valorem taxes are expected to be significant in the later years of the study period. During the last 10 years

of the study period, tax revenues are expected to be more than $4 million higher per year than those under Alternative 1 (Figure 4-28), which exceeds the significance threshold.

Impacts on Population

Activities within the RMPPA under this alternative would increase employment on average by 184 persons per year. The increase in employment would mostly be tied to increased oil and gas development. Recent southwest Wyoming NEPA assessments have assumed that 50 to 55 percent of direct workers would be non-local. However, it is likely that local workers would fill most indirect and induced jobs. Under these assumptions, it is possible that the population would increase under this alternative because of additional workers and their families moving into the study area to fill needed positions. It is likely that these individuals would move to areas close to where the gas development would occur (western portions of the RMPPA). Communities such as Rawlins and Rock Springs would be able to absorb any increases in population of this magnitude because the current populations in these areas are substantially lower than the peak levels of the 1980s. However, some smaller communities and unincorporated communities might not be able to easily absorb a significant increase in population. Therefore, some localized impacts are possible.

Impacts on Community Services

As discussed above, increases in population are possible under this alternative. It is assumed that increases in population would be tied to employment increases, mainly associated with oil and gas development within the RMPPA. For this reason, it is anticipated that increases in population would occur in western portions of the study area near sites of oil and gas development. The relatively small increases in employment are not expected to strain community services in western counties or towns, such as Rawlins or Rock Springs. Populations in these areas are now substantially below the peak levels reached in the 1980s when community services were built to handle larger populations. However, if population increases were to occur in smaller communities or unincorporated areas, the community services that supported these areas, might be strained. For instance, large drilling programs in the area have recently strained public services in Wamsutter. Although town officials are addressing these needs through increased housing and public facility planning, in the short term, increased demand for government services and housing would not be met. A similar situation has occurred in Baggs. Although Baggs can accommodate oil and gas workers on a short-term basis, if additional contractors and employees relocated in Baggs, community services would be strained.

Tax revenues generated are expected to increase significantly over time under this alternative with increased oil and gas production. This increase should have a positive impact on local government services supported by ad valorem tax receipts. This effect is especially important to Sweetwater and Carbon Counties, where most of the oil and gas production would be located. Impacts on other types of tax receipts are not expected to be significant under this alternative. However, increases in tax revenues might not be beneficial to smaller communities in the study area that receive little direct tax revenue associated with oil and gas production. For these areas, it would be more difficult to adjust to changes in demand for government services that might occur with increases in population.

Impacts on Custom, Culture, and Social Trends

The management of the RMPPA would likely cause a change in population trends in the western portion of the study area. Impacts on custom and culture are possible as some areas of the RMPPA are industrialized to support more oil and gas operations. Communities such as Rock Springs and Rawlins have developed around mineral extraction industries and would likely support these activities. However, other communities, which have been more agriculturally based, would experience changes in custom and

culture as the population changed to support this alternative activity. Population changes would likely bring new individuals to the area who might have different opinions and values than current residents. This could lead to changes in overall social trends in localized areas.

In addition, increased oil and gas development is expected to have localized negative impacts on wildlife resources within the RMPPA. These negative impacts could be detrimental to certain groups of persons within the study area. For instance, a decline in recreational activities is expected under this alternative with the increase in oil and gas development. This could have negative effects on lifestyles within the study area.

Environmental Justice

The identified minority or low-income populations would not be disproportionately affected under this alternative compared with other segments of the general population in the area.

Summary

Although increased oil and gas development is expected to have positive impacts in the form of increased employment, earnings, and mineral tax revenues, negative impacts could occur to certain lifestyles with a decline in wildlife resources. In addition, changes in population could lead to greater demands on government services in certain parts of the study area. Changes in management under this alternative might have localized impacts on population trends, whereas increases in ad valorem taxes are expected to be significant toward the later part of the study period, which could affect government services. Under this alternative, some existing conditions and social trends are expected to be affected, but environmental justice impacts are not expected.

4.12.3 Impacts Under Alternative 3: Emphasis on Protection of Resources

Management actions under Alternative 3 are expected to change activities on BLM-administered lands, which could have socioeconomic impacts in the study area. Decreased oil and gas development within the RMPPA would cause a decrease in employment, which would be concentrated in western portions of the study area. Decreasing employment would likely cause the population to fall in communities such as those most tied to oil and gas development. In addition, changes in management prescriptions would likely benefit certain lifestyles. Some hunters and recreationists might experience long-term benefits from the protection of wildlife, open landscapes, and solitude from development activities.

Impacts on Regional Employment

Under Alternative 3, management actions within the RMPPA are expected to cause a decrease in regional employment relative to Alternative 1. Over the 20-year study period, employment is expected to average 3,044 jobs per year—approximately 258 fewer jobs than the average per year expected under Alternative 1 (Figure 4-26). A decline in future potential employment is expected under this alternative as a result of restrictions on oil and gas development. However, some increases in employment would occur with expansion of recreational activities. Employment associated with grazing operations is expected to be the same as that under Alternative 1. Changes in overall employment are not expected to be significant because these changes fall within the estimated significant thresholds. However, there might be some localized impacts in communities that depend more heavily on RMPPA activities for employment opportunities.

Impacts on Regional Income

Regional income under Alternative 3 is expected to decline in the study area relative to Alternative 1. Under this alternative, potential regional income is expected to exceed $1.2 billion, an 8-percent decline from Alternative 1 (Figure 4-27). However, an increase in recreational visitor days under this alternative is expected to increase income to the businesses that support these activities. Income associated with grazing is expected to be the same as that under Alternative 1.

Impacts on Tax Revenues

Tax revenues associated with activities in the RMPPA are expected to decline under Alternative 3 relative to Alternative 1. This expected decline is mainly attributed to the reduction in future oil and gas production expected under this alternative. The total present value of mineral tax revenues is expected to exceed $1.8 billion under this Alternative, a 13-percent decline from Alternative 1. Positive effects on tax revenues are also expected with the increase in recreational activities under this alternative, although the impacts are not expected to be significant. Changes in tax revenues relative to Alternative 1 are expected to be significant because the changes exceed $4 million in most years of the study period, which is greater than the established significance threshold.

Impacts on Population

Although the decline in employment resulting from this alternative is not expected to have a significant impact on population in the four-county study area, there might be noticeable changes to overall employment in some local areas in the western portions of the study area. Changes would be especially likely in Rock Springs and Rawlins, where there is a concentration of oil and gas services companies. A lack of employment opportunities might lead to further migration of individuals from western portions of the study area, which is similar to the trends during the 1990s and early 2000s for some parts of the study area.

Impacts on Community Services

Tax revenues are expected to decline significantly under this alternative during the study period. This decline would likely have a negative impact on the government services that depend on these ad valorem and severance taxes as a revenue source. Because many oil and gas taxes and royalties are equalized across the state, especially in education, this decline in tax and royalty revenue would affect all tax-receiving entities in the State of Wyoming. This effect would be greatest in Carbon and Sweetwater Counties, where ad valorem tax changes have a direct consequence.

In addition, it is likely that western portions of the study area would experience a decline in demand for government services, associated with changes in population. These declines might be similar to trends in the 1990s for parts of the western portions of the study area. For instance, school enrollments in Sweetwater County experienced significant declines in the 1990s, which followed declines in population. In addition, Rock Springs and Rawlins have infrastructures that were built for larger populations, and it is likely that this infrastructure would not be fully used if the population continued to decline.

Other more rural parts of the study area might also experience a change in demand for government services under this alternative. These smaller communities might be better able to absorb changes in population under an alternative with less development opportunities.

Impacts on Custom, Culture, and Social Trends

Under this alternative, custom and culture throughout much of the study area would remain the same. However, impacts are expected in localized areas. For instance, a decrease in development opportunities in RMPPA would affect the employment opportunities for communities in western portions of the study area. This might lead to further migration of individuals from communities, such as Rock Springs and Rawlins, which are highly dependent on mineral extraction industries.

Management actions under this alternative could also have positive impacts on certain lifestyles. Certain population segments would be pleased with the increased protection for wildlife resources, as well as with the protection of undisturbed landscapes that can provide isolation and solitude. Other groups would benefit from less industrialization of the RMPPA and greater dependency on the traditional agricultural uses that have been important to localized areas.

Environmental Justice

The identified minority or low-income populations would not be disproportionately affected under this alternative compared with other segments of the general population in the area.

Summary

Restrictions on oil and gas development are expected to have negative impacts on future potential increases in employment, earnings, and mineral tax revenues in the study area. However, positive impacts could occur to certain lifestyles with increased protection of wildlife resources. Changes in management under this alternative might affect population trends in western portions of the study area, and decreases in future ad valorem taxes are expected to be significant, which could have negative impacts on government services. Under this alternative, environmental justice impacts are not expected.

4.12.4 Impacts Under Alternative 4: Proposed Plan

Management activities on BLM-administered lands under Alternative 4 would be similar to those described under Alternative 1. Positive economic impacts in the form of employment and earnings are expected with continued oil and gas development in the RMPPA. Proposed management prescriptions would cause dissatisfaction among persons and groups displaced by development activities. Some hunters and recreationists might be temporarily displaced by increased well drilling and field development. In addition, some persons and groups might experience long-term impacts from a loss of open landscapes and solitude as a result of development activities.

Impacts on Regional Employment

Management actions within the RMPPA under Alternative 4 are expected to cause a slight decrease in regional employment relative to Alternative 1. Over the 20-year study period, employment is expected to average 3,261 jobs per year, approximately 41 fewer jobs than the average per year expected under Alternative 1. Slight changes in employment are expected because of restrictions on oil and gas development. Employment tied to recreation and grazing is not expected to vary from that under Alternative 1. Impacts on employment under this alternative are not expected to be significant.

Impacts on Regional Income

Regional income under Alternative 4 is expected to decline slightly in the study area relative to Alternative 1. Under this alternative, regional income is expected to exceed $1.3 billion, a decline of 1

percent from Alternative 1. Regional income attributed to changes in recreation or grazing is not expected to change from Alternative 1.

Impacts on Tax Revenues

Changes in management actions under Alternative 4 are expected to have a slight impact on tax revenues generated for government entities. The total present value of mineral tax revenues is expected to exceed $2 billion under this alternative, a 1-percent decline from Alternative 1. No impacts on tax revenues are expected to occur with changes in recreation or grazing. Annual changes in ad valorem taxes are expected to be below $1 million per year and are not viewed as having a significant impact on the study area.

Impacts on Population

Changes in regional employment are not expected to have significant impacts on population trends within the study area under this alternative relative to Alternative 1.

Impacts on Community Services

As discussed above, notable changes in population or tax revenues are not expected under this alternative. Therefore, identifiable changes in demand for or supply of government services are not expected to result from this alternative.

Impacts on Custom, Culture, and Social Trends

Although this management alternative supports different priorities and the differences might be identifiable on a localized basis, the social structure and lifestyle conditions and trends within the RMPPA would generally remain the same as those under current conditions.

Environmental Justice

The identified minority or low-income populations would not be disproportionately affected under this alternative compared with other segments of the general population in the area.

Summary

Socioeconomic impacts under Alternative 4 are expected to be similar to those under Alternative 1. Activities within the RMPPA are expected to support jobs and income in the local economy. These jobs and income levels are more important to western portions of the study area, which are more closely tied to activities within the RMPPA. Management actions are not expected to have significant impacts on population trends or government services. Under this alternative, existing conditions and social trends would generally remain the same; environmental justice impacts are not expected.

4.13 SPECIAL DESIGNATIONS/MANAGEMENT AREAS

SD/MAs provide management actions for unique natural, historic, scenic, or recreational resources in the RMPPA. This section presents the impacts that implementation of management actions for other resource programs might have on SD/MAs.

Significance Criteria

Impacts on SD/MAs would be considered significant if any of the following occurred:

- A level of development or activity occurred that is incompatible with the SD/MA objectives and management prescriptions
- An activity or development impaired the suitability of WSAs for preservation as wilderness
- Resources were adversely affected to the point that an SD/MA no longer meets the criteria for designation
- An activity or development impaired the outstandingly remarkable characteristics of the eligible and suitable WSR segments to the point that the existing conditions in these areas no longer meet the criteria for designation.

Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of resources and the RMPPA and review of existing literature. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate.

The analysis is based on the assumption that WSAs in the RMPPA would continue to be managed under the WSA Interim Management Policy, H-8550-1, until such time as Congress either designates all or portions of the WSAs as wilderness or releases the WSAs, or portions of the WSAs, from any further consideration for wilderness and the lands revert back to general land use management.

The six practical effects of Interim Management Policy for Lands Under Wilderness Review are as follows: (1) lands under wilderness review must be managed so as not to impair their suitability for preservation as wilderness; (2) permitted activities in WSAs are temporary, create no new surface disturbance, and involve no permanent placement of structures; (3) grazing, mining, and mineral leasing uses that existed on the inception of FLPMA (October 21, 1976) might continue in the same manner and degree; (4) lands under wilderness review might not be closed to appropriation under the mining laws to preserve their wilderness character; (5) valid existing rights must be recognized; and (6) all lands must be managed to prevent unnecessary and undue degradation.

RFDs and RFAs can be found in Appendix 33.

4.13.1 Wilderness Study Areas

4.13.1.1 Impacts Common to All Alternatives

The IMP H-8550-1 allows for little flexibility in management decisions. Hence, the impacts have minimal variation among the alternatives. The IMP precludes surface disturbing and most other disruptive

activities and sets management guidelines aimed at the preservation of wilderness characteristics. The management actions outlined in Table 2-1 for WSAs are supplemental to the guidance found in the IMP.

High priority would be given to acquisition of nonfederal inholdings within WSAs through exchange. The only WSA with inholdings is Ferris Mountain. Inholders may decide to develop private or state lands within WSAs. This would potentially diminish the wilderness character of the WSA. If developed, it would no longer generally appear to be affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable. It would no longer have outstanding opportunities for solitude or a primitive and unconfined type of recreation. Acquisition of inholdings is the only way to ensure the wilderness character of Ferris Mountain WSA would be retained.

Livestock grazing actions would use monitoring data to adjust grazing levels and manage grazing to meet the Wyoming Standards for Healthy Rangelands. These actions would prevent degradation of the naturalness of the WSAs.

WSAs are managed as VRM Class I areas in accordance with BLM policy (Instruction Memorandum No. 2000-096). The management objective for VRM Class I lands is to preserve the existing character of the landscape. Visual impairments outside and adjacent to WSAs would be allowed if they were in conformance with the appropriate VRM classification of the adjoining area. Although these impairments would be visible to a visitor looking out from inside the WSA, they would not be considered an impact that impaired wilderness suitability within the WSA.

Management of wild horses at AML within the Adobe Town WSA, management to meet Wyoming Standards for Healthy Rangelands, and monitoring are used to maintain the quality of habitat within HMAs. These actions would ensure wild horses do not overgraze the habitat and create adverse impacts, such as erosion, sedimentation, loss of vegetation, or displacement of wildlife. There are no HMAs in or adjacent to the other WSAs.

4.13.1.2 Impacts Under Alternative 1: Continuation of Existing Management

Because of the limitations of the IMP on management actions, only fire and fuels management, OHV management, WSAs, WSRs, and vegetation management affect WSAs. Other programs would have little or no impact on WSAs.

The use of wildland fire for resource benefit would allow wildland fire to play its natural ecological role, resulting in maintenance or improvement of the vegetation resource in WSAs (e.g., habitat productivity, species diversity, disease/pest resistance). Fuels reduction treatments would be conducted to restore vegetation community health and thus maintain the wilderness qualities.

Limiting motorized access in the Adobe Town WSA to designated roads and vehicle routes would help limit the impacts of motorized travel to existing levels within the WSA. Leaving motorized travel limited to roads existing at the time when the Ferris Mountain, Encampment River Canyon, Prospect, and Bennett Mountain WSAs were established would not prevent the creation of new unauthorized vehicle routes within the WSAs that could impair their wilderness suitability. Proliferation of unauthorized routes within the Prospect and Encampment River Canyon WSAs has been an ongoing problem.

As directed by BLM IM-2004-196, all waterway segments eligible for inclusion in the Wild and Scenic River System would be managed to protect their free-flowing nature, outstandingly remarkable values, and tentative classifications. Some of these segments lie at least partially within WSAs. These include approximately 2.4 miles of the Encampment River within the Encampment River Canyon WSA, approximately 31.0 miles of Skull Creek and its tributaries within the Adobe Town WSA. These

segments were tentatively classified as wild, therefore protective management of the segments would differ from WSA interim management only in minor ways, such as prohibiting increases in grazing authorizations within 1/4 mile of the high-water line on each side of the waterway.

Approximately 1.6 miles of Cherry Creek lies within the Ferris Mountains WSA. It has been tentatively classified as scenic, which means that its protective management for WSR would not be as strict as management for wild segments. WSRs would, therefore, have negligible impact on the Ferris Mountain WSA, Bennett Mountains WSA, and Prospect Mountains WSA.

Vegetation treatments would be limited to hand or aerial application within WSAs in accordance with the IMP. Vegetation management actions would result in weed treatments within the WSAs. However, with the continued lack of adequate treatments, weeds would continue to expand into the WSAs, degrading the wilderness qualities.

Summary

Fire and fuels management and vegetation management actions would potentially improve vegetative resources in WSAs. Proliferation of unauthorized routes that could impair wilderness suitability would potentially continue in the Prospect and Encampment River Canyon WSAs.

4.13.1.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from WSAs would be the same as those under Alternative 1. Because of the limitations of the IMP on management actions, other programs would have little or no impact on WSAs.

Fire and fuels management actions would emphasize suppression of all wildland fires regardless of ignition source, which would limit wildland fires to the smallest acreage possible and allow for prescribed fires to be conducted under more controlled conditions. The potential for catastrophic wildfires is high for Ferris Mountain WSA, considering the history in the area. The potential for wildfires is high in Bennett Mountain, Prospect Mountain, and Encampment River WSAs. The emphasis on suppression would greatly reduce the potential for wildland fires to remove vegetation cover and reduce the wilderness qualities.

Wild and Scenic Rivers would have no impact on WSAs because all eligible segments would be determined to be nonsuitable for inclusion in the National Wild and Scenic River System. All segments would be released from further consideration for WSR. No special protections would be afforded to these segments.

Summary

Impacts on WSAs would be similar to those of Alternative 1, except that all waterway segments would be determined to be nonsuitable for WSR suitability evaluation, so WSRs would not impact WSAs.

4.13.1.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Because of the limitations of the IMP on management actions, only WSAs, WSRs, vegetation, and VRM would affect WSAs. WSR management would have the same impacts on WSAs as those described in Alternative 1. Other programs would have little or no impact on WSAs.

The use of wildland fire for resource benefit would allow wildland fire to play its natural ecological role, resulting in maintenance or improvement of the vegetation resource in WSAs (e.g., habitat productivity,

species diversity, disease/pest resistance), except within the Encampment River WSA. It would be managed for AMR with an emphasis on suppression to protect the municipal water supply for Encampment. This would not provide the opportunity to use fire in its natural role in the ecosystem. Therefore, fire would be unlikely to remove decadent vegetation and improve habitat conditions. In the long term, declining habitat would offer fewer wildlife viewing opportunities. This would also create conditions conducive to catastrophic wildfires in the long term, which would degrade the setting, wildlife habitat, and the municipal water supply. Fuels reduction treatments would be conducted to restore vegetation community health and thus maintain the wilderness qualities.

Under this Alternative, all WSAs would be closed to all types of motorized travel, which would allow the revegetation of two-track vehicle routes, reduction in erosion, and decrease in establishment or spread of weed species. This would enhance the wilderness character of the WSAs by allowing natural vegetation to return and visual impacts to heal. Boundary roads and vehicle routes would remain open, which could potentially detract from the scenic quality of the WSA when looking out from inside the WSA, but would be considered an impact on the wilderness suitability.

Vegetation management priority would be given to control of noxious and invasive species and maintenance and attainment of native, weed-free communities. This would improve wilderness characteristics within the WSAs through improvement of wildlife and fish habitat, vegetation condition, and water quality. The Encampment River WSA would especially benefit from weed control because of the population of thistles adjacent to the river.

Two WSAs would benefit from additional VRM Class II designations adjacent to their boundaries—7,500 acres adjacent to the Bennett Mountains WSA and 76,570 acres surrounding the Ferris Mountains WSA. These designations would help to preserve the visual quality of landscapes by requiring application of additional BMPs or mitigation on any surface disturbing activity or new facility to comply with the management objectives of VRM Class II. Application of BMPs or mitigation required for development in Class II areas would potentially reduce the noise, surface disturbance, and visible facilities which would reduce the amount of development impacting the solitude of WSAs.

The VRM Class II designation would be difficult to manage on lands adjacent to the Adobe Town WSA because they have moderate oil and gas potential, lands are already leased, and these lands are therefore likely to be developed in the future. Mitigation for VRM Class II would be difficult, given the terrain in the region, because there is little opportunity to hide roads and facilities from key observation points along access routes or to blend them into existing contours or vegetation. BMPs would still be applied to reduce the amount of visual disturbance to the area so that visual impacts from developments would be minimized.

Summary

Management actions proposed under Alternative 3 would afford more protection of wilderness characteristics than other alternatives. The wilderness characteristics of the WSAs would be protected and enhanced by closing roads to all types of motorized use, creating VRM Class II areas adjacent to the Bennett Mountains and Ferris Mountains WSAs, and improving control of noxious and invasive species. This would also create conditions conducive to catastrophic wildfires in the long term, which would degrade the setting, wildlife habitat, and the municipal water supply.

4.13.1.5 Impacts Under Alternative 4: Proposed Plan

Because of the limitations imposed by the IMP on management actions, only WSAs, WSRs, and VRM impact WSAs. Fire and fuels impacts would be the same as in Alternative 3.

All WSAs, excluding the Ferris Mountain WSA, would be closed to OHV use, which would allow the revegetation of two-track vehicle routes, a reduction in erosion, and a decrease in establishment or spread of weed species. These closures would improve the natural vegetation communities, aesthetics, and suitability of the WSAs for designation as wilderness. Allowing vehicle travel on designated roads and vehicle routes within the Ferris Mountain WSA would potentially increase the amount of erosion, and increase the potential for establishment or spread of weed species, potentially impairing the wilderness suitability of the WSA.

Management of the Encampment River waterway segment within the Encampment River Canyon WSA (approximately 2.4 miles) as suitable for inclusion in the WSR System would have the same type of impacts as those described in Alternative 1.

Vegetation management actions would result in weed treatments within the WSAs. However, the focus of treatments to eliminate small and control large infestations would allow large patches of weeds to remain in the WSAs, potentially degrading the wilderness qualities.

Two WSAs would benefit from additional VRM Class II designations adjacent to their boundaries—7,500 acres adjacent to the Bennett Mountains WSA and 76,570 acres surrounding the Ferris Mountains WSA. These designations would help to preserve the visual quality of landscapes by requiring application of additional BMPs or mitigation on any surface disturbing activity or new facility to comply with the management objectives of VRM Class II. Application of BMPs or mitigation required for development in Class II areas would potentially reduce the noise, surface disturbance, and visible facilities, which would reduce the amount of development impacting the solitude of WSAs.

Summary

Proposed management actions would protect wilderness character better than those of Alternatives 1 or 2. Wilderness qualities would be protected and enhanced by closing roads to OHV use and designating VRM Class II areas adjacent to the Bennett Mountains and Ferris Mountains WSAs.

4.13.2 Como Bluff ACEC/NNL

4.13.2.1 Impacts Common to All Alternatives

Management actions associated with air quality management, fire and fuels management, forest management, vegetation management, OHV management, recreation management, socioeconomics, other SD/MAs, transportation and access management, water quality, watershed and soils management, wild horse management, and wildlife management would have little or no impact on the Como Bluff ACEC/NNL.

Management actions associated with cultural resources would provide direct protection to the Como Bluff NRHP listed district from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity (Appendix 5) and include measures such as cultural resource inventory, evaluation of NRHP eligibility, and mitigation of potential effects, generally through avoidance. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve the integrity of the NRHP listed district, mitigation measures would be prescribed on a case-by-case basis, depending upon the nature of the action. Mitigation measures would reduce the potential for significant effects to the historic district. These management actions would apply to any proposed actions that have the potential to impact the district.

Where the integrity of setting contributes to NRHP eligibility, management actions resulting in visual elements that diminish the integrity of the district's setting would be managed in accordance with the Wyoming State Protocol and BMPs (Appendix 5). Potential effects would be determined by comparing the existing environment without the proposed action against the projected environment with the addition of the proposal. Potential effects would be minimized through the use of BMPs as discussed in Appendix 5. Additional mitigation measures would be developed on a case-by-case basis as necessary in consultation with the SHPO and other affected parties.

Lands and realty management and livestock grazing management actions resulting in development projects within the setting of the historic district that contributes to NRHP eligibility would be mitigated to minimize significant effects. Assessment of potential impacts would be conducted through viewshed analysis, on-site inspection, and photo analysis. Mitigation measures including, but not limited to, decreasing the height of structures, using paint and topography to blend structures into the background, enhanced reclamation of ROW corridors, and using materials that match the existing environment to construct access roads would be used to minimize the visual intrusions that would dominate the landscape associated with the historic district (Appendix 5). Significant impacts would occur if developments could not be mitigated to eliminate adverse effects to the setting.

Lands and realty management actions not associated with minerals development would include alternative energy development (specifically wind energy), communication sites, and utility/transportation ROWs. Areas with important resource values such as the historic district would be avoided. However, because of the nature of these types of developments, significant impacts would be anticipated to the setting of the historic district. Large-scale projects such as these dominate the landscape, compromising the integrity of the setting and feeling of the historic district—values that make these resources eligible for the NRHP. Best management practices are generally not sufficient to mitigate these types of effects.

Acquisition of nonfederal lands (Appendix 6) would benefit the historic district and the paleontological resources located therein by potentially consolidating ownership of the ACEC. BLM management actions would apply to the acquired portions, providing additional protective measures to maintain or enhance the integrity of setting, feeling, and association of the historic district and the paleontological resources located therein.

Implementing the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve soil stability and vegetation cover, thereby protecting the physical integrity and the setting of the ACEC. Overuse of an area by livestock and wildlife would potentially accelerate soil erosion, leading to loss of important paleontological resources. In most instances, these types of impacts would be minimal. However, long-term impacts from grazing would potentially occur from repeated trailing over time, especially along fence lines, near water sources, and in sheltered or shaded areas. Proper construction of water developments and range improvements, and proper placement of salt and mineral supplements would help minimize adverse impacts to paleontological deposits. Any potential impacts to the ACEC would be evaluated prior to the construction of fences, water developments, and other range improvements, and appropriate mitigation measures would be implemented if needed.

The Como Bluff ACEC is open to oil and gas development. However, none of the area has been leased and it lies in a low potential area for oil and gas development. There is little likelihood that the area would be developed for oil and gas, thus impacts associated with these activities would be minimal. Should the area be leased in the future, examination of all proposals would result in minimal impacts through the use of BMPs and mitigation.

Locatable mineral entry and mineral material disposals would have the same types of impacts as those described for oil and gas development. A plan of operations would be required for all locatable mineral

activities regardless of the size of the operation. The likelihood of locatable mineral entry is low; therefore, the impacts associated with these actions would be minimal. The potential for mineral material disposals is also low. These actions are discretionary and would not be approved within high-value areas. The impacts associated with these types of actions would be minimal.

The steep terrain associated with the ACEC/NNL would preclude the occurrence of many surface disturbing activities in this area. Moreover, given the relatively small size of the ACEC/NNL, most impacts associated with surface disturbing activities would likely be avoided. If avoidance is not possible, a case-by-case examination of proposed surface disturbing activities would be conducted to determine potential adverse effects and appropriate mitigation measures.

Standard inventory prior to any surface disturbing activities within the ACEC would allow for identification and thus protection of paleontological resources. Paleontological resource management would emphasize protection of important scientific values, thereby helping maintain the relevant and important values of the ACEC. Paleontological resources would continue to be identified and studied through promotion and facilitation of research by qualified individuals. Vertebrate fossil collection would be allowed via Paleontological Resources Use Permit, ensuring the protection of fossil resources and any information gathered during the recovery process.

Management actions specifically designed to protect the paleontological resources located in the Como Bluff ACEC/NNL would help maintain the relevant and important values for which the area was designated. Restricting and intensively managing oil and gas development and locatable mineral exploration and development within the area would reduce the potential for unmitigated impacts on paleontological resources.

The use of BMPs (Appendices 13, 14, 15, and 19) to minimize disturbance to vegetation would protect the integrity of the historic and paleontological district by minimizing soil erosion, which would help prevent the degradation of important paleontological resources. Achieving the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve vegetation cover and production, species diversity and litter, and soil stability, thereby maintaining the integrity of the setting and feeling of the historic district. Reclamation practices would help restore the integrity of the setting of the historic district in those areas where they have been previously compromised.

The majority of the land in the Como Bluff ACEC/NNL is private, and there is no legal public access. The lack of public land ownership within the ACEC boundaries does not allow for any management prescriptions beyond what the NNL designation and NRHP listing affords.

4.13.2.2 Impacts Under Alternative 1: Continuation of Existing Management

Management actions associated with air quality management, fire and fuels management, forest management, vegetation management, OHV management, recreation management, socioeconomics, other SD/MAs, water quality, watershed and soils management, wild horse management, and wildlife management would have little or no impact on the Como Bluff ACEC/NNL.

The ACEC is an avoidance area for surface disturbing activities resulting from cultural resource management actions. This would provide additional protections to the important paleontological resources of the ACEC by reducing the potential for surface disturbing activities to remove or damage intact resources. While avoidance of the ACEC may influence some proposed developments, it would not preclude actions from occurring. Any development within the boundaries of the ACEC would be designed so as not to affect the relevant and important values of the area, thus impacts would be minimal.

Impacts associated with wind energy development would not occur under this alternative, because it is designated as an exclusion area (Table 2-5). While the ACEC is designated an avoidance area for utility/transportation systems, the likelihood of placing a linear facility within the ACEC is low based on the important resources located within the ACEC. Should it be determined that a ROW would be authorized through the ACEC, it would be designed so as to have little or no impacts to the relevant and important values of the ACEC. Standard inventory and recordation procedures conducted in conjunction with lands and realty actions would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the ACEC. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but the impacts would be mitigated through standard treatment measures.

Standard inventory and recordation procedures conducted in conjunction with range improvement actions would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the ACEC. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but the impacts would be mitigated through standard treatment measures.

Should oil and gas development be proposed within the Como Bluff ACEC, any proposed action located within 1/4 mile of exposures of the Morrison Formation would be intensively managed, resulting in minimal impact. Standard inventory and recordation procedures conducted in conjunction with oil and gas development would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the ACEC. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but the impacts would be mitigated through standard treatment measures.

Locatable mineral entry and mineral material disposals would have the same types of impacts as those described for oil and gas development. A plan of operation would be required for all locatable mineral activities regardless of the size of the operation. The likelihood of locatable mineral entry is low; therefore, the impacts associated with these actions would be minimal. The potential for mineral material disposal is also low. These actions are discretionary and would not be approved within high-value areas. The impacts associated with these types of actions would be minimal.

The Como Bluff ACEC designation would be maintained under this alternative. However, because of the limited public lands within the ACEC, development of an ACEC management plan would be difficult without private landowner agreement. With the amount of private land located within the ACEC, it would be necessary to acquire adjacent lands and easements across public land so that private landowners could access their private lands located therein. Standard inventory and recordation procedures conducted in conjunction with easements would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the ACEC. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but impacts would be mitigated through standard treatment measures.

As appropriate, mitigation measures would be required for all surface disturbing activities within the Como Bluffs ACEC. All impacts that may occur from BLM management actions would be mitigated to avoid significant impacts to the relevant and important values of the ACEC.

Summary

The majority of the land in the Como Bluff ACEC and NNL is private and there is no legal public access. Surface disturbing activities resulting from BLM management actions would have the potential to damage or dislocate paleontological resources through unanticipated discoveries. However, the relevant and

important values of the ACEC would be protected through measures associated with cultural resource management and paleontological management.

4.13.2.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Management actions associated with air quality management, fire and fuels management, forest management, vegetation management, OHV management, recreation management, socioeconomics, other SD/MAs, water quality, watershed and soils management, wild horse management, and wildlife management would have little or no impact on the Como Bluff ACEC/NNL.

Impacts associated with cultural resource management, lands and realty management (excluding wind energy development), livestock management, oil and gas development, common variety minerals development, paleontology management, and management of the Como Bluff NNL (except it would not be managed as an ACEC), and transportation and access management would be the same as those described in Alternative 1.

The ACEC would not be maintained in this alternative, thus the area would be an avoidance area for wind energy development. The potential for wind energy development within the area is moderate because it lies within fair to good wind energy potential (Map 3-2). Standard inventory and recordation procedures conducted in conjunction with wind energy development would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the ACEC. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but the impacts would be mitigated through standard treatment measures.

Impacts from locatable and common variety mineral material activities would be similar to those in Alternative 1 except that a plan of operation would not be required for locatable activities of 5 acres or less.

Summary

The majority of the land in the Como Bluff NNL is private and there is no legal public access. Surface disturbing activities resulting from BLM management actions would have the potential to damage or dislocate paleontological resources through unanticipated discoveries. However, the scientific and historic values of the area would be protected through measures associated with cultural resource management and paleontology management.

4.13.2.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Management actions associated with air quality management, fire and fuels management, forest management, vegetation management, OHV management, recreation management, socioeconomics, other SD/MAs, water quality, watershed and soils management, wild horse management, and wildlife management would have little or no impact on the Como Bluff ACEC/NNL.

Impacts associated with lands and realty management, livestock management, minerals management, and paleontology management would be the same as those described in Alternative 1.

Protections to the ACEC resulting from cultural resource management would increase under this alternative. Prohibiting surface disturbing activities within 1/4 mile of historic properties where the setting contributes to NRHP eligibility would preclude surface disturbing activities throughout the entire district. In addition, any paleontological resources located immediately outside the boundary of the ACEC would also be protected under this action.

Closure of approximately 1,690 acres to the operation of the public land laws to maintain resource values in the Como Bluff ACEC would restrict the location of ROWs and prohibit lands and realty actions.

Impacts from oil and gas development would be similar to Alternative 1.

Impacts from locatable and common variety mineral material activity would be similar to those in Alternative 1.

The Como Bluff ACEC designation would be maintained under this alternative. However, because of the limited public lands within the ACEC, development of an ACEC management plan would be difficult without private landowner agreement. Given the amount of private land located within the ACEC, it would be necessary to establish easements across public land so that private landowners could access their private lands located therein.

Acquisition of adjacent lands or easements to improve public access would be considered and evaluated. Although this would allow more effective management of the NNL, pursuing new access areas would increase the potential for unauthorized collection of paleontological data; however, such impacts would be minimal. Facilitating use of these areas would also result in increased surface disturbing recreational activity and loss of vegetation cover, which would increase the potential for exposure and deterioration of paleontological resources. Standard inventory and recordation procedures conducted in conjunction with easements would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the ACEC. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but impacts would be mitigated through standard treatment measures.

Summary

The majority of the land in the Como Bluff ACEC and NNL is private and there is no legal public access. Surface disturbing activities resulting from BLM management actions would have the potential to damage or dislocate paleontological resources through unanticipated discoveries. However, the relevant and important values of the ACEC would be protected through measures associated with cultural resource management and paleontology management.

4.13.2.5 Impacts Under Alternative 4: Proposed Plan

Management actions associated with air quality management, fire and fuels management, forest management, vegetation management, OHV management, recreation management, socioeconomics, other SD/MAs, water quality, watershed and soils management, wild horse management, and wildlife management would have little or no impact on the Como Bluff NNL.

Impacts from lands and realty would be the same as those described in Alternative 2.

Impacts from transportation and access management would be the same as those described in Alternative 3.

Impacts from oil and gas development would be similar to those under Alternative 1.

Impacts from locatable and common variety mineral material would be similar to those under Alternative 1, except a plan of operation would not be required for operations of fewer than 5 acres.

Impacts associated with cultural resource management, lands and realty management, livestock management, minerals management, and paleontology management would be the same as those described in Alternative 1.

Acquisition of adjacent lands or easements to improve public access would be considered and evaluated. Although this would allow more effective management of the NNL, pursuing new access areas would increase the potential for unauthorized collection of paleontological data; however, such impacts would be minimal. Facilitating use of these areas would also result in increased surface disturbing recreational activity and loss of vegetation cover, which would increase the potential for exposure and deterioration of paleontological resources.

The Como Bluff ACEC designation would be terminated under this alternative. However, because of the limited public lands within the area, development of an ACEC management plan would be difficult without private landowner agreement. Given the amount of private land located within the NNL, it would be necessary to establish easements across public land so that private landowners could access their private lands located therein. Standard inventory and recordation procedures conducted in conjunction with easements would protect most paleontological resources from significant damage and would increase the database of paleontological resources within the NNL. A small but proportional number of these resources may be adversely impacted as a result of unanticipated discoveries, but the impacts would be mitigated through standard treatment measures.

Summary

The majority of the land in the Como Bluff NNL is private and there is no legal public access. The Como Bluff ACEC designation would be terminated; however, the values for which it was designated an NNL and listed in the NRHP would be protected through intensive management of all surface disturbing activities, acquisitions of private lands, and easements across private lands.

The management actions associated with the NNL designation and NRHP listing would be similar to those under Alternative 1, thereby providing adequate protection to the relevant and important values for which this area was originally designated an ACEC. Surface disturbing activities resulting from BLM management actions would have the potential to damage or dislocate paleontological resources through unanticipated discoveries. However, the important scientific and historical values of the NNL would be protected through measures associated with cultural resource management and paleontology management.

4.13.3 Sand Hills ACEC and Potential JO Ranch Expansion

4.13.3.1 Impacts Common to All Alternatives

Air quality, forest management, paleontology, other SD/MAs excluding the Historic Trails SD/MA, VRM, wild horse management, and wildlife and fish management actions would have little or no impact on the Sand Hills ACEC/JO Ranch expansion area.

Protection of cultural resource sites under the NHPA within the Sand Hills ACEC would provide indirect, localized protection to the unique vegetation complex and wildlife habitat associated with the ACEC when cultural resource sites overlap with other resource values. Application of the Wyoming State Protocol and BMPs (Appendix 5) would potentially minimize ground disturbance through project redesign, relocation of facilities, and/or preclusion of development in certain areas. This would help protect the unique vegetation community complex, consisting of antelope bitterbrush, silver sage, big sage, rabbit brush, chokecherry, and serviceberry, which supports the abundance of wildlife (mule deer, elk, greater sage-grouse, sharp-tailed grouse, and raptors) for which the area was originally designated an

ACEC. At the same time, projects may be moved for protection of cultural resources into vegetation stands, which would potentially damage the unique wildlife habitat.

Designing fire and fuels management actions to manipulate vegetation in a more controlled manner would decrease the potential for catastrophic wildland fires. The potential for catastrophic wildland fires is high, considering the history in the area. Suppression would limit wildland fires to the smallest acreage possible and allow for prescribed fires to be conducted under more controlled conditions. This would greatly reduce the potential for wildland fires to remove vegetation cover and damage or destroy the historic buildings associated with the JO Ranch. In addition, this would help preserve the unique vegetation community complex, consisting of antelope bitterbrush, silver sage, big sage, rabbit brush, chokecherry, and serviceberry that supports the abundance of wildlife (mule deer, elk, greater sage-grouse, sharp-tailed grouse, and raptors) for which the area was originally designated an ACEC.

Designation of ROW corridors, which would include powerlines, telephone lines, fiber optic lines, pipelines, and other linear type ROWs outside the Sand Hills ACEC (Table 2-3), would ensure protection of the unique vegetative complex by eliminating the potential for surface disturbance from these actions.

Management of livestock grazing to meet Wyoming Standards for Healthy Rangelands would maintain the unique vegetative complex of the Sand Hills ACEC. By meeting standards, the unique vegetative complex of the ACEC would not be enhanced; however, management would ensure that the ACEC does not lose the relevant and important values for which it was designated an ACEC. Livestock grazing would reduce the overall availability of forage, primarily grass and forbs, for wildlife species, but would in some cases increase forage palatability for big game species. These impacts would be tempered through the conformance with the Standards for Healthy Rangelands (USDI, BLM 1997), which would assure that the forage use by all grazing animals would not result in impairment of wildlife habitat.

Recreation management activities such as hiking, camping, hunting, shed-antler hunting, and sightseeing that result in increased human presence would increase the potential for big game wildlife displacement. Owing to the high number of wildlife species that the habitat supports and the historic JO Ranch property, there is a high likelihood of increased human presence within the ACEC. Most recreation activities would occur throughout the year. Such activities would result in minor displacement and heightened stress or flight response that would preclude animals from normal relaxed activities that allow for maintenance of optimum body condition. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Geist 1978).

Designation of an NSO on the 18 acres surrounding the JO Ranch buildings would ensure that no surface disturbing and disruptive activities would physically affect the integrity of the NRHP eligible property. This would ensure that the site does not suffer adverse effects that may render it not eligible for listing in the NRHP.

Management actions resulting in development projects within the setting of the historic trails SD/MA that contribute to NRHP eligibility would be mitigated to minimize significant effects. Mitigation measures would be used to minimize visual intrusions that would otherwise dominate the landscape associated with the historic trails (Appendix 5). This would result in indirect benefits to the historic setting of the Sand Hills ACEC by reducing the number of visual intrusions.

Because the Sand Hills ACEC has an extremely high road density (9 miles per square mile) creation of a transportation plan for managing these roads would benefit the relevant and important values of the ACEC. Closure, modification, and/or maintenance of roads would benefit the unique vegetation community by restricting access to these areas and minimizing the potential for wildlife displacement.

Vegetation treatments would have short-term impacts on the ACEC by reducing vegetation cover and increasing soil erosion. However, over the long term, vegetation treatments conducted at the appropriate times of the year would enhance plant vigor, vegetation cover, and species diversity. Any vegetation treatment would be designed to increase forage and habitat for wildlife species and to maintain the desired plant communities of the area. Vegetation treatments, designed to create cells for containment of wildland fires to smaller acreages, and fuels treatments would likely be conducted in the spring to create smaller vegetation mosaic areas of different age classes and fuel types to reduce the potential for catastrophic wildland fires in the future.

Management actions associated with water quality, watershed, and soils management designate much of the Sand Hills ACEC as an avoidance area for surface disturbing activities because of the presence of Cow Creek, numerous springs scattered throughout the area, and unstable nature of the mobile sand dunes. Although avoidance of these areas may influence some proposed developments, it would not preclude actions from occurring. Much of the unique bitterbrush complex is within the loosely compacted sand dunes that are highly erosive. Avoiding vehicular travel in these areas would decrease the potential for erosion as traffic otherwise would remove vegetation, exposing soil to wind erosion.

4.13.3.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, forest management, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access management, and wild horse management actions would have little or no impact to the Sand Hills ACEC/JO Ranch expansion area.

Designation of a 1/4-mile avoidance area around historic properties where the setting is an aspect of integrity would benefit the unique vegetative complex of the Sand Hills ACEC by minimizing surface disturbance in those areas where these two resources overlap. This would indirectly help to preserve the relevant and important values for which the ACEC was designated.

Designing fire and fuels management actions to manipulate vegetation in a more controlled manner would decrease the potential for catastrophic wildland fires. The potential for catastrophic wildland fires is high, considering the history in the area. Suppression would limit wildland fires to the smallest acreage possible and allow for prescribed fires to be conducted under more controlled conditions. This would greatly reduce the potential for wildland fires to remove vegetation cover and damage or destroy the historic buildings associated with the JO Ranch. In addition, this would help preserve the unique vegetation community complex, consisting of antelope bitterbrush, silver sage, big sage, rabbit brush, chokecherry, and serviceberry that supports the abundance of wildlife (mule deer, elk, greater sage-grouse, sharp-tailed grouse, and raptors) for which the area was originally designated an ACEC.

Not withdrawing the Sand Hills ACEC from operation of the public land laws would allow for all types of realty actions to occur. While the ACEC would be avoided by utility corridors and communication sites, these actions are not precluded from occurring. Communication site development would create hazards to birds and bats and produce visual intrusions to the historic setting. In addition, lands and realty actions would remove portions of the unique bitterbrush/big sagebrush vegetation community and thereby degrade the big game crucial winter range and the raptor and grouse habitats provided by this vegetation community.

The unique vegetation complex that supports wildlife habitat and wildlife of the Sand Hills ACEC would be protected from disturbance associated with wind energy development. No wind energy development projects would be allowed within the ACEC, ensuring that disturbances to wildlife species and associated habitat from these types of actions would not occur.

Range improvements would continue to be small in scale, with minimal amounts of associated surface disturbance. In the immediate vicinity of any new water developments, livestock use would reduce available forage and cover for wildlife and shift livestock use from adjacent locations. Additional water sources would provide opportunities to adjust livestock grazing to allow vegetation to improve in production and cover, increase litter, and complete reproductive cycles. Case-by-case examination of all management actions would analyze these potential effects, ensuring that these actions would not result in degradation of the vegetation communities and the habitat they provide for wildlife and watershed health.

Fences are livestock management tools that limit grazing animals to specific areas while providing for the needs of other resource values. This area was historically used for sheep grazing, and many fences were constructed to control sheep. These types of fences are more restrictive to wildlife movement—particularly big game species—than fences built to control cattle. Fences create travel barriers that alter animal use patterns, cause energy loss and stress, and occasionally lead to death of big game from entanglement or injury. They also create obstructions for birds to fly into and serve as perches for songbirds and raptors. The conversion of fences to meet BLM standards would decrease wildlife energy loss and stress, injury, entanglement, and mortality. However, existing fences that do not meet current BLM standards would continue to impede movement of big game species and other wildlife.

Bison grazing in this area would result in competition for forage with elk and conflicts over forage allocation and utilization, particularly in areas identified as elk crucial winter range. The need for potentially more restrictive fences to control bison movement would result in greater barriers to big game movement, increased stress, energy loss, and mortality. Because the ACEC sees much recreational use, there would be a higher potential for conflicts between bison and humans.

The Sand Hills ACEC lies within high and moderate potential areas for oil and gas development. In addition, the entire ACEC is currently leased. The likelihood of the area being developed is high, based on existing proposals and the high and moderate potential. The primary type of gas extraction within the area would be coalbed natural gas. Coalbed natural gas extraction would require 80-acre well spacing with minimal potential for directional drilling. There is a potential for conventional gas drilling within the area as well. Conventional gas drilling would not necessarily require 80-acre spacing of gas wells and there would be more opportunities for directional drilling. There would also be opportunities to collocate conventional gas wells with coalbed natural gas wells. Management actions resulting in construction that is visible on or above the surface would have the potential to directly impact the visual integrity of the Sand Hills ACEC.

Oil and gas development would remove portions of the unique bitterbrush/silver sagebrush vegetation community and thereby degrade the big game crucial winter range and the raptor and grouse nesting habitats provided by this vegetation community. Additional impacts would include loss, degradation, or fragmentation of habitat, and displacement of wildlife species from areas disturbed by authorized activities, such as well pads, linear features such as roads and pipelines, and other permitted facilities including compressor stations (Cole et al. 1997; Grover and Thompson 1986; Hurley and Sargeant 1991; Leptich and Zager 1991; Lyon 1979; McCorquodale et al. 2003; Rost and Bailey 1979; Sawyer et al. 2005a; Unsworth and Kuck 1991).

Coalbed natural gas development within the Sand Hills ACEC would reduce the number of male grouse inhabiting leks within or adjacent to coalbed natural gas development. Recent research from Alberta and Wyoming indicates that energy development may have substantial negative impacts on sage-grouse populations (Aldridge 2005; Holloran 2005). Although coalbed natural gas is different than other types of mineral development, several features of coalbed natural gas are known to negatively affect sage-grouse populations, including loss of sagebrush habitat, expansion of roads and power lines, increased human

activity, and the spread of invasive plants (Gelbard and Belknap 2003) and West Nile virus (Walker et al. 2004).

Geophysical exploration within the ACEC would temporarily displace wildlife species, increase dust and noise, and increase human presence and vehicle traffic. Much of the unique bitterbrush complex is within loosely compacted sand dunes that are highly erosive. Any repeated vehicular traffic associated with geophysical activity would increase the potential for erosion because traffic would remove vegetation. In addition, offroad vehicular traffic would compact soils and crush vegetation. These actions would temporarily remove portions of the unique bitterbrush/big sagebrush vegetation community and thereby degrade the big game crucial winter range and the raptor and grouse nesting habitats provided by this vegetation community.

Locatable mineral entry and mineral material disposals would have the same types of impacts as those described for oil and gas development. Plans of operation would not be required for locatable mineral activities that would cause surface disturbances of 5 acres or less. Because activities of 5 acres or less or bulk samples of 1,000 tons or less only require a notice to be filed with the BLM, adverse impacts would be anticipated to the vegetation communities that provide wildlife habitat. These activities are subject to reclamation requirements, which would lessen the long-term impact in the area. The likelihood of locatable mineral entry or mineral material disposals, however, is low, based on the low number of planned reasonably foreseeable developments (Appendix 33). Mineral material permits are discretionary. Therefore, any such request would be evaluated individually. A potential action deemed incompatible with management objectives for the area would be denied.

Allowing OHV use to retrieve big game kills and to access campsites would result in displacement of, and increased stress to, wildlife when these activities occur in crucial habitat or during critical time periods. Inappropriate use of OHVs and motorized vehicles during wet periods would remove vegetative cover, create scars on moderate to steep slopes that would become erosional channels and increase sediment delivery into drainages. Impacts associated with this action would be similar to those described for vehicular traffic associated with oil and gas management.

Management of the Sand Hills ACEC would protect the unique vegetation community, thereby maintaining the suitability of habitats for big game species and the relevant and important values of the ACEC. However, the unique values of the ACEC extend beyond the existing boundaries into the proposed JO Ranch expansion area, which would not receive the same level of protection under this alternative. The historic JO Ranch would be stabilized to protect the historic and cultural values for which it is eligible for inclusion in the NRHP. The 18 acres surrounding the historic ranch would be an NSO for surface disturbing activities. This would protect the physical remains of the historic ranch and the immediate setting that contributes to the NRHP eligibility of the ranch. The current VRM classification (Class III) would not provide any additional protections to the integrity of the historic ranch setting.

OHV use on roads and vehicle routes, over-the-snow vehicle use, and vehicle use for “necessary tasks” would result in displacement of, and increased stress to, wildlife when these activities occur in crucial habitat or during critical time periods. Limiting OHV use to designated roads and vehicle routes would enhance manageability of the public and restrict access to vital wildlife forage and habitat areas as well as the more fragile components of the unique vegetation complex. However, there is still evidence that there is a heightened response to motorized traffic when animals are closer to roads (Recarte et al. 1998; Taylor and Knight 2003; Wisdom et al. 2004). Based on the high road density within the Sand Hills ACEC, it would be assumed that even limits on OHV traffic to designated roads would still result in a high degree of animal displacement and heightened energy loss. Inappropriate use of OHVs and motorized vehicles during wet periods would remove vegetative cover, create scars on moderate to steep slopes that would become erosional channels and increase sediment delivery into drainages. Impacts associated with OHV

use, over-the snow vehicle use, and vehicle use for “necessary tasks” would be similar to those described for vehicular traffic associated with oil and gas management.

The Sand Hills ACEC overlaps the Historic Trails ACEC along its western boundary. Avoiding surface disturbing activities within the Historic Trails ACEC would reduce the amount of surface disturbance-related impacts on the unique bitterbrush/silver sagebrush vegetation community and associated wildlife habitat where the ACEC and trails overlap. This protection of the trails would provide an indirect benefit to the historical values of the Sand Hills ACEC, because the Rawlins to Baggs road within the Historic Trails ACEC provided a direct link between the JO Ranch and local communities.

Vegetation treatments would focus on enhancing the health and diversity of plant communities through the use of natural fire and management prescriptions, such as burning; plantings; seeding; and chemical, mechanical, biological, and grazing treatments. Incorporation of BMPs and other management actions to achieve Standards for Healthy Rangelands would improve health, vigor, structure, and diversity of the unique vegetation complex. Any improvement in vegetation communities would improve the overall wildlife habitat condition. The current level of treatments would not achieve management goals for the Sand Hills ACEC. This includes treatments targeting both diversification of bitterbrush/silver sagebrush stands as well as those targeting control of weeds. Consequently, the proliferation of weed species would continue, resulting in the continued degradation of watershed health and wildlife habitat.

Management actions associated with water quality, watershed, and soils management would help maintain soil stability and wildlife habitat within the ACEC. Surface disturbing activities would be limited in areas of unstable or sensitive soils, thereby protecting the soil structural composition necessary to sustain the unique vegetation in this ACEC.

Allowing surface discharge of produced water within the ACEC would potentially accelerate erosion and deposition, altering stream channel characteristics within Cow Creek beyond what would be expected with natural processes. Increased deposition and erosion to stream systems would change the channel dynamics such that undesirable aggradation or degradation would occur. Cut banks would be more likely to slough on a continual basis, resulting in additional suspended sediments. During high-flow events, there would be an increased potential for erosion because of reduced infiltration and stream armoring which concentrates flows. In addition, there would be increased salt loading and a decline in water quality downstream.

Water development projects designed for wildlife needs would continue to support the diversity of species that inhabit the area. These projects would be large in size, thus would create habitat for fish populations. Some developments would be fenced to preclude livestock use. These developments would create wetland habitat for waterfowl nesting and brood rearing. These types of developments would be large enough to sustain water levels during drier periods, supporting wildlife and providing off-site water for livestock.

Avoidance or intensive management of surface disturbing activities in sensitive wildlife habitats would provide additional protection to the values of the ACEC by reducing the potential for such activities to remove vegetation communities and degrade wildlife habitat. Vegetation resources would be completely protected in active raptor nesting areas, where surface disturbing activities are prohibited. Development would not be allowed to occur within 825 feet of active raptor nests and during critical periods, including the winter months within crucial winter range. In addition, the areas within 1/4 mile of sage-grouse leks would be avoidance areas. These types of restrictions would serve to protect wildlife species during critical time periods and in critical areas necessary for species viability. Because this area is proposed as a WHMA, protections designed to sustain multiple species would continue to provide for wildlife needs.

Summary

Surface disturbing activities resulting from lands and realty management, minerals management, OHV use management, and recreation management would remove and degrade portions of the unique bitterbrush/silver sagebrush vegetation community. Intensive management of these activities would reduce, but not eliminate, these impacts. The limited restrictions on surface disturbing and disruptive activities under this alternative would allow some loss of the relevant and important values of the ACEC. Moreover, these values would not be protected beyond the boundaries of the existing ACEC. This would potentially reduce the number of wildlife species that inhabit the region, rendering it unacceptable as a WHMA.

Cultural resource management; vegetation management; water quality, watershed, and soils management; wildlife and fisheries management; and some aspects of fire and fuels management and livestock grazing management would help preserve the unique vegetation community complex that supports the abundance of wildlife in the area for which the area was originally designated as an ACEC.

4.13.3.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, forest management, locatable minerals, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access management, and wild horse management actions would have little or no impact to the Sand Hills ACEC/JO Ranch expansion area.

Impacts on the Sand Hills area from cultural resources management; fire and fuels management; OHV management; the Historic Trails SD/MA; visual resource management, and water quality, watershed, and soils management would be the same as those identified under Alternative 1.

Impacts from lands and realty management and minerals management actions (including oil and gas development) would be similar to those under Alternative 1, except that the actions would not be seasonally restricted. There would be no timing restrictions on surface disturbing and disruptive activities in big game crucial winter range, parturition areas, and greater sage-grouse/sharp-tailed grouse breeding, nesting, and wintering habitat. Development activities in these habitats would result in a larger degree of loss or alteration under this alternative than under Alternative 1. Much of the Sand Hills ACEC is within mule deer crucial winter range. Allowing surface disturbing and disruptive activities within the crucial winter range would result in a greater degree of displacement, because wintering mule deer have been shown to vacate areas surrounding well pads during periods of concentrated human activity (Reeve 1996). A higher degree of displacement during the winter months has been shown to relate directly to winter mortality of mule deer (Fralick 1989). Disturbance to elk during the calving season would result in reduced reproductive success (Phillips and Alldredge 2000).

Degradation of critical habitats, increased wildlife stress, displacement of species to lower quality or less preferred habitat, and lower reproductive success of wildlife could result in loss of the relevant and important values that qualify the Sand Hills as an ACEC. Displacement of species would result in local reductions in wildlife populations if adjacent, undisturbed habitats are at carrying capacity. In this situation, animals are either forced into less optimal habitats or they compete with other animals that already occupy unaffected habitats. Possible consequences of such displacement are lower survival, lower reproductive success, lower recruitment, and ultimately lower carrying capacity and reduced populations (Oil and Gas Mitigation Working Group, Wyoming Game and Fish Department 2004).

While the area would be an avoidance area for wind energy development, the potential still exists for development to occur because portions of the WHMA lie within outstanding potential for wind energy (Map 3-2). Wind energy development would create hazards to birds and bats and produce visual

intrusions to the historic setting. In addition, wind energy development would remove portions of the unique bitterbrush/big sagebrush vegetation community and thereby degrade the big game crucial winter range and the raptor and grouse habitats provided by this vegetation community.

Impacts as a result of livestock grazing under this alternative would be the same as those under Alternative 1, but there would be more emphasis on livestock production that would result in further development of water and pasture fencing. These practices would expand livestock use into upland locations that previously had light to no utilization. Higher levels of livestock utilization would increase competition for forage with elk, particularly in areas identified as winter and crucial winter range. Additional barriers to wildlife movement would increase the stress, energy loss, and mortality for big game species.

Impacts from the management of the Sand Hills area pertaining to VRM classification would be the same as those described under Alternative 1. However, the ACEC designation would be terminated, and the area would be managed as a WHMA. The JO Ranch buildings and related facilities would not be stabilized, (although the historic and cultural values of the ranch would still be retained as required by law). This Alternative also differs from Alternative 1 in that plans of operation for locatable federal mineral exploration and development (except casual use) would be required only for surface disturbances of 5 acres or more. This would likely result in localized increases in surface disturbance related to these activities, thereby increasing the potential for removing vegetation cover and degrading wildlife habitat. Impacts from these actions would be similar to those described for lands and realty, minerals, and transportation and access management under this alternative. However, because the potential for locatable minerals in this area is low, impacts would be minimal.

Increased vegetation treatments would reduce acreages of dense, mature/decadent shrub cover to increase species diversity and production of vegetation. This would result in early seral stage communities dominated by grasses and forbs, which would benefit cattle and elk. Hiding cover for mule deer and elk, and nesting and foraging habitat of songbirds and small mammals would be reduced. As plant succession occurs, there would be improved diversity of shrubs, increasing forage for mule deer and Columbian sharp-tailed grouse. As the shrub canopy increases, the area would provide nesting and brood-rearing habitat for greater sage-grouse. Some wildlife species would be less likely to inhabit this area until shrub stands regenerate, increasing inter- and intra-specific competition in adjacent occupied habitats. The vegetation communities would be managed to emphasize early seral stage rather than mosaics of mixed age and cover classes. This would result in loss of the relevant and important values that qualify the Sand Hills area as an ACEC.

Less restrictive management actions to protect wildlife habitat would allow increased levels of surface disturbance within the area. Allowing surface disturbing and disruptive activities within the crucial winter range would result in a greater degree of displacement, as wintering mule deer have been shown to vacate areas surrounding well pads during periods of concentrated human activity (Reeve 1996). A higher degree of displacement during the winter months has been shown to relate directly to winter mortality of mule deer (Fralick 1989).

Summary

The Sand Hills ACEC designation would be terminated and the area would be managed for multiple use. Increased vegetation treatments would help preserve the unique vegetation community complex consisting of antelope bitterbrush, silver sagebrush, big sagebrush, rabbitbrush, snowberry, chokecherry, and serviceberry that supports the abundance of wildlife (mule deer, elk, greater sage-grouse, Columbian sharp-tailed grouse, and raptors) for which the area was originally designated an ACEC. Enhanced livestock production would favor grassland communities over shrub communities. This would benefit

some wildlife species (e.g., elk) but would reduce the overall habitat diversity that supports a greater variety of wildlife. However, because of less restrictive wildlife protection measures (i.e., lack of timing and spacing restrictions), lands and realty management and minerals management including oil and gas development would potentially remove a large portion of the vegetation complex, removing crucial winter habitat and causing displacement of wildlife species. These impacts would escalate to significant levels if development and other disruptive activities removed or degraded wildlife habitat to levels that render it uninhabitable for species of concern. The actions proposed in this Alternative would result in a loss of the values that would qualify the Sand Hills area as a WHMA.

4.13.3.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, forest management, paleontology management, recreation management, other SD/MAs excluding the Historic Trails SD/MA, transportation and access management, and wild horse management actions would have little or no impact to the Sand Hills ACEC/JO Ranch expansion area.

Impacts associated with fire and fuels management would be the same as those described in Alternative 1.

Cultural resource management actions would increase protections to the historical, vegetation, and wildlife values for which the ACEC is designated under this alternative. Prohibiting surface disturbing activities within 1/4 mile of historic properties where the setting contributes to the NRHP eligibility would eliminate all surface disturbance-related impacts on the unique bitterbrush/silver sagebrush vegetation community and associated wildlife habitat where the two resources overlap.

Withdrawing the Sand Hills ACEC from operation of the public land laws would not allow for any types of realty actions to occur. The unique vegetation complex, which provides wildlife habitat in the Sand Hills ACEC, would be protected from disturbance associated with all types of realty actions, including utility corridors, wind energy development, and communication sites. Management actions would ensure disturbance to wildlife species and associated habitat would not occur.

Range improvements would continue to be small in scale, with a reduction in associated surface disturbance because of greater emphasis on fence conversions rather than new fences. In the immediate vicinity of any new water developments, livestock use would reduce available forage and cover for wildlife and shift livestock use from adjacent locations. Protection and maintenance of existing water sources would be emphasized prior to development of additional water sources. This would lessen the flexibility to provide opportunities to adjust livestock grazing to allow vegetation to improve in production and cover, increase litter, and complete reproductive cycles. Case-by-case examination of all management actions would analyze the potential effects, ensuring that these actions would not result in degradation of the vegetation communities and the habitat it provides for wildlife and watershed health.

Fences would all be modified to meet BLM standards, that would alter the types of fences big game pass through, under, or over, but reduce the number of fences they negotiate moving between summer and winter ranges. Impacts to big game and other wildlife such as stress, energy loss, change in animal distribution, and death or injury from entanglement would continue but at a much lower rate. Fences would still create obstructions for birds to fly into and serve as perches for songbirds and raptors. Trespass and control of livestock would become more problematic as all fences are converted to meet BLM standards. Fence locations such as at drainage crossings, fence corners, and those close to water sources would receive more pressure from livestock. These fences would require more maintenance but would still be unlikely to prevent animals from crossing to the other side.

Prohibiting the grazing of bison on blocked public lands would affect the entire ACEC. Competition for forage with elk would not occur, which would reduce conflicts over forage allocation and utilization,

particularly in areas identified as elk crucial winter range. The need for stronger fences to control bison movement would not exist; therefore, there would not be greater barriers to big game movement compared with Alternative 1. This area is used extensively by the public during the fall hunting seasons, so prohibiting bison from this area would reduce the potential for incidents between bison and humans.

Prohibiting OHV use off existing roads and vehicle routes to retrieve big game kills and to access campsites would not impact the ACEC.

The Sand Hills ACEC is closed to all new oil and gas leasing, locatable mineral entry, and operation of the public land laws. However, the entire ACEC is currently leased for oil and gas development. The likelihood of the area being developed is high, based on existing proposals and the area's high and moderate potential. Management actions resulting in construction visible on or above the surface would have the potential to directly impact the visual integrity of the Sand Hills ACEC. Intensive management of existing oil and gas leases would provide some protections to the unique vegetation complex; however, there would still be impacts similar to those described in Alternative 1.

The Sand Hills ACEC would be expanded to include the JO Ranch expansion area. The expansion area contains the same unique vegetation complex, grouse habitat, and crucial big game winter range as the original Sand Hills ACEC. As a result of this expansion, the ACEC would increase from 7,960 acres to 12,680 acres. Expansion of the ACEC to include more of the unique vegetation complex would protect more of the mule deer crucial winter range and wildlife habitat within the area. Management actions for the ACEC, especially those prohibiting surface disturbing activities, would minimize conflicts with other resources and maintain the natural and cultural values of the ACEC.

Not allowing new fence construction within the ACEC would eliminate disruptions to wildlife from new fences including increased stress, injury, entanglement, and energy loss. Livestock management alterations including distribution and movement would use other methods such as herding in place of new fences. This would reduce flexibility in livestock management strategies.

Surface disturbance within vegetation communities critical to wildlife, including silver sagebrush and antelope bitterbrush, would be precluded. Not allowing disturbance of the unique vegetation community would maintain forage quality and quantity, maintain hiding cover, and reduce stress during critical time periods. In addition, displacement of wildlife from loss of habitat would be minimized.

Closing the Sand Hills/JO Ranch ACEC to over-the-snow vehicles would minimize the probability of animal displacement of Columbian sharp-tailed grouse and greater sage-grouse, pronghorn, mule deer, and elk during the winter months.

Prevention of offroad vehicular travel for "necessary tasks" would result in fewer disturbances to wildlife habitat and forage. There would be a lesser degree of loss of the unique bitterbrush/big sagebrush vegetation community, thereby maintaining raptor and grouse nesting habitats and big game crucial winter range provided by this vegetation community. Because there would be less human disturbance to wildlife, there would be decreased energy costs and improved animal fitness and reproductive potential.

VRM actions would provide additional protection to the Sand Hills ACEC by classifying the area within 2 miles (or the visual horizon) of the historic JO Ranch as VRM Class II. This action would influence the size, scope, or location of surface disturbing activities, potentially reducing the amount of wildlife habitat loss. In some cases, VRM Class II designation would result in the relocation of a facility. Relocation of facilities would take into account the multiple wildlife, vegetation, and historical qualities that the ACEC encompasses. Facilities would be sited in areas that do not support the unique vegetation complex. The

scenic values and historical integrity of the ACEC would be protected by this VRM management action through the use of BMPs described in Appendix 25.

Stabilizing the JO Ranch buildings for public health and safety would allow for increased visitation to the area. An interpretative site at the JO Ranch would allow for opportunities to provide information and education about historic resources in the area, including early transportation routes, the history of ranching, and the importance of protecting historic resources. This would increase community awareness for historic resources and reduce the potential for incidental or purposeful disturbance of cultural resources.

Development of the historic JO Ranch into an interpretive site exhibiting late 19th century ranching in the area would also increase the number of recreational visitors. Because the area is crucial winter range for mule deer as well as habitat for sharp-tailed grouse, greater sage-grouse, elk, and pronghorn, the potential for wildlife and human interactions would be high. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Geist 1978).

The Sand Hills ACEC overlaps the Historic Trails ACEC along its western boundary. Prohibiting surface disturbing activities within the Historic Trails ACEC would eliminate all surface disturbance-related impacts on the unique bitterbrush/silver sagebrush vegetation community and associated wildlife habitat where the two ACECs overlap. This protection of the trails would provide an indirect benefit to the historical values of the Sand Hills ACEC, because the Rawlins to Baggs road within the Historic Trails ACEC provided a direct link between the JO Ranch and local communities.

Vegetation treatments would focus on achievement of DPC through enhancement of the health and diversity of plant communities through the use of natural fire and management prescriptions such as burning, plantings, seeding, and chemical, mechanical, biological, and grazing treatments. Incorporation of BMPs and other management actions to achieve Standards for Healthy Rangelands would improve health, vigor, structure, and diversity of the unique vegetation complex. Any improvement in vegetation communities would improve overall wildlife habitat condition. Treatments would target diversification of bitterbrush/silver sagebrush stands as well as control of weeds.

Water quality, watershed and soils management actions would prohibit surface discharge of produced water from federal leases, protecting the ACEC from erosion and channel modification in response to changes in surface hydrology. Drainage channels and riparian habitat would not be influenced by increased surface water flow regimes and higher volumes under which they were developed and not subjected to increased year long flows and/or water quality.

Impacts on the Sand Hills ACEC from wildlife management would be similar to those under Alternative 1, except that more restrictive management actions to protect wildlife habitat (e.g., increasing buffer zones around greater sage-grouse and Columbian sharp-tailed grouse lek habitat, greater seasonal restrictions, controls, and prohibitions on surface disturbing activities) would benefit big game, raptor, and sage-grouse habitat associated with the ACEC. There would be less potential for wildlife displacement in comparison with Alternative 1.

Summary

Actions related to lands and realty management, minerals management, OHV management, and recreation management would have reduced impacts as compared to Alternative 1 by additional protections afforded to the area from other resource programs. Additional restrictions applied to surface disturbing and disruptive activities would result in the indirect maintenance of wildlife habitat values.

Cultural resource management; vegetation management; water quality, watershed, and soils management; wildlife and fisheries management; and some aspects of livestock grazing management would help maintain the vegetation communities that support a diversity of wildlife by restricting development within critical areas or during critical time periods.

4.13.3.5 Impacts Under Alternative 4: Proposed Plan

Air quality, forest management, locatable minerals, paleontology, recreation, other SD/MAs excluding the Historic Trails SD/MA, transportation and access management, and wild horse management actions would have little or no impact to the Sand Hills ACEC/JO Ranch expansion area.

Impacts on the Sand Hills ACEC from cultural resource management, minerals management (including oil and gas development), big-game seasonal closures of the ACEC, expansion of the ACEC to include the JO Ranch expansion area, protections from the Historic Trails Area, vegetation management, and VRM would be the same as those identified under Alternative 3.

Impacts on the Sand Hills ACEC from fire and fuels management; lands and realty management; livestock grazing management; water quality, watershed, and soils management; and vegetation management would be the same as those identified under Alternative 1.

OHV management actions would allow OHV travel 300 feet off existing roads and vehicle routes to retrieve big game kills and to access campsites. This would result in impacts similar to those described in Alternative 1, with the exception that the impacts would be localized to the 300-foot buffer.

The development of an interpretive program for the JO Ranch area would provide for increased awareness of and appreciation for its cultural, wildlife, vegetation, and scenic qualities. This would increase community awareness for historic resources and reduce the potential for incidental or purposeful disturbance of cultural resources. Developing an interpretive program at the JO Ranch rather than making the area an interpretive site would allow for the flexibility to restrict human presence during critical time periods for wildlife.

Impacts on the Sand Hills ACEC from wildlife management would be similar to those identified under Alternative 1, except that more protective stipulations, in the form of longer timing restrictions would be required for greater sage-grouse, sharp-tailed grouse, and raptors. The longer restrictions would better reflect breeding and nesting periods and would reduce potential disturbance and habitat loss and increase reproductive success of grouse within the ACEC. Implementation of BMPs within big game crucial winter range would reduce stress. Raptor timing restrictions would also be altered to better reflect individual species' requirements, which would increase protection for raptors during critical periods.

Summary

Surface disturbing activities resulting from lands and realty management, minerals management, OHV management, recreation management, and some aspects of watershed, water quality, and soils management would remove and degrade portions of the unique bitterbrush/silver sagebrush vegetation community. Intensive management of these activities would help reduce, but would not eliminate, these impacts. The restrictions on surface disturbing and disruptive activities under this alternative would allow for some loss of the vegetation communities and associated wildlife habitats. This would potentially reduce the number of wildlife species that inhabit the region, rendering it unacceptable as a WHMA. These values would be protected beyond the boundaries of the existing ACEC in the JO Ranch expansion area.

Cultural resource management; fire and fuels management; livestock grazing management; vegetation management; water quality, watershed, and soils management; and wildlife and fisheries management would help maintain the unique vegetation community complex that supports the abundance of wildlife for which the area was originally designated as an ACEC. These values would be protected beyond the boundaries of the existing ACEC in the JO Ranch expansion area.

4.13.4 Jep Canyon ACEC/WHMA

4.13.4.1 Impacts Common to All Alternatives

The Jep Canyon ACEC/WHMA (13,810 acres) would be managed to emphasize protection of elk crucial winter range and raptor nesting habitats. Air quality management, cultural resources management, forest management, paleontology management, SD/MAs (with the exception of the Jep Canyon ACEC/WHMA), socioeconomics, transportation and access management, and wild horse management would have little or no impact on the Jep Canyon ACEC/WHMA.

Suppression of wildland fires within the checkerboard lands of the Jep Canyon ACEC/WHMA would result in retention of the present mix of vegetation communities, which are in predominantly mature to decadent conditions. Small acreages burned would provide some increased herbaceous production where the shrub overstory has been removed. Wildland fire management in association with private and state lands would provide opportunities for the use of wildland fire for resource benefit and prescribed fires to improve the rangeland vegetation condition. When needed, wildland fire rehabilitation and restoration efforts would reduce the time required for burned rangeland to return to a productive state and decrease the likelihood of weed infestations. Fuels treatments in industrial interface areas (existing oil and gas development activity and infrastructure) would contribute to the reduction in number and size of wildland fires.

Lands and realty actions would have little or no impact to the Jep Canyon ACEC/WHMA, except that placement of any surface disturbing or disruptive activities within the management area would require applicable BMPs or mitigation measures to ensure important resources are not adversely affected.

Livestock grazing would result in direct competition with wildlife for forage, water, and space as well as result in minor disruption of normal wildlife activities during maintenance of existing range improvements. Livestock grazing would reduce the overall availability of forage, primarily grasses and forbs, but would, in some cases, increase forage palatability for big game species. Old or decadent herbaceous vegetation that is appropriately grazed normally responds by producing new, higher quality forage that is more desirable to wildlife such as elk. This area has been evaluated for Standards for Healthy Rangelands (USDI, BLM 1997) (Appendix 8), and livestock grazing use levels appropriate to healthy rangelands have perpetuated herbaceous vegetation production necessary for maintenance of elk winter ranges.

Intensive management of oil and gas development may prevent loss of significant amounts of either elk winter range or aspen woodlands or rock outcrops important as raptor nest sites. BMPs (Appendix 15) would be implemented to protect important wildlife habitats, including elk crucial winter range, specifically, and big game migration and foraging areas generally, as well as nesting substrates for raptors. Careful consideration of oil and gas facility siting to avoid aspen patches, wind blown slopes important for elk winter forage, rock outcrops, and adequate undisturbed habitat around potential or existing nest sites would retain the value of these areas to wildlife. The majority of the Jep Canyon area is currently leased for oil and gas exploration and development. Immediately to the west and southwest of this area, considerable development associated with extraction of CBNG has already occurred. Year-round access to interim drilling pods has increased human presence and activity along the western

boundary of the ACEC, especially during the winter. In addition, the 20-mile access road, associated CBNG pipelines, and ancillary facilities have become avoidance areas for wintering elk on the western portion of the area. Avoidance distances, which vary by species, would effectively reduce the function of large areas of once suitable habitat because of the animal's aversion to human presence, noise, and oil and gas infrastructure. With the levels of development anticipated and associated outward expansion, it is unlikely that all sensitive or important habitats necessary for big game populations can be sustained and maintained at current objectives. Appropriate application of reclamation practices (Appendix 36) would speed recovery of plant communities and forage production, quality, and quantity important for sustained wildlife habitat. However, until the human presence and oil and gas development and disruptive activities are concluded along the western boundary, wildlife may not occupy the entire Jep Canyon ACEC in predisturbance numbers.

Lack of industry mitigation and BMP commitment on private and state lands would result in weed infestation on public, private, and state lands. In addition, lack of road standards on private and state lands would contribute to increased erosion and habitat degradation. Where industry follows BLM road standards on nonfederal lands, the impacts would be reduced.

Geophysical exploration subject to appropriate BMPs, wildlife-related spatial and temporal restrictions, and adherence to State of Wyoming standards for geophysical operations would result in minor, short-term increased stress, displacement, and disruption of normal wildlife activities resulting from human presence, noise, equipment, and aircraft present during geophysical activities. Healthy wildlife during the summer months would have little difficulty avoiding geophysical activities and returning to normal foraging activities important to maintenance of body condition and fitness.

Termination of existing withdrawals from locatable mineral entry would have little effect on vegetation, wildlife, or wildlife habitat. Even though the Jep Canyon area would again be open to locatable mineral entry, there is little foreseeable locatable mineral development anticipated within the RMPPA (Appendix 33). Because there is little likelihood of development, disturbance of wildlife and/or loss of habitats important to elk or raptors would not occur. Mineral materials potential is low and disposals are discretionary. Therefore, if conflicts are identified, the permit would be denied.

Although OHV management limits OHVs to designated roads and vehicle routes, OHV activities result in increased human presence would have a moderate localized impact on wildlife species. Impacts to big game species would include displacement, altered seasonal use patterns, increased stress during critical time periods, and degradation of habitat. OHV use within riparian areas and stream channels would also have negative impact on bank stability and riparian vegetation. OHV use on steep slopes and unstable soils would also increase erosion. Human presence and activity related stresses to wildlife would be anticipated to be more frequent in the Jep Canyon area because of its proximity to one of the larger communities in the RMPPA. On the other hand, the U.P.R.R. checkerboard land pattern and the private land access restrictions in the area may reduce this impact.

Recreation management activities such as hiking, camping, hunting, shed-antler hunting, and sightseeing that result in human presence would increase the potential for big game wildlife displacement. Owing to the high number of wildlife species that the habitat supports, there is a high likelihood of human presence within the area. Recreation activities would occur throughout the year and would result in minor displacement and heightened stress or flight response. Such responses would preclude animals from normal relaxed activities that allow for maintenance of optimum body condition. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Geist 1978).

VRM classes define allowable visual intrusions resulting from management actions. The Jep Canyon area is listed under VRM Class II and Class III. Class II objectives are to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Class III allows management activities that partially retain the existing character of the landscape. Developmental activities such as gas development and range improvements may have mitigations measures involving color and height or may be restricted in other ways.

Intensive management of all surface disturbing and disruptive activities within the Jep Canyon area would prevent the loss or function of important elk crucial winter range or raptor nesting habitat. BMPs (Appendices 14, 15, and 18) and appropriate reclamation of surface disturbance (Appendix 36) applied to individual project proposals on a case-by-case basis would result in impacts similar to those resulting from oil and gas development above.

Vegetation treatments would be implemented to create more diverse plant communities and improve values for wildlife. Application of all forms of control of noxious and invasive plant species (Appendix 19) would address the widest range of noxious and invasive weed problems. Rapid, vigorous, and site-specific control of noxious and invasive species would reduce the size of existing infestations on native ranges and prevent weeds that colonize new surface disturbance from expanding into native range. In some cases, where native plants are not able to compete successfully for water and nutrients, native plants are not able to preclude noxious and invasive species from successfully pioneering undisturbed, native sites. Adequate control of weed patches maintains native range forage species diversity, density, and productivity important to both wildlife and livestock.

Water quality, watershed, and soil management actions that include intensive management of surface disturbing activities in areas that contribute to 303d-listed waterbodies would likely reduce impacts from some surface disturbing activities (Appendix 13). Such management actions would also likely reduce impacts from surface disturbing activities in identified watersheds and wetlands perennial waters. Avoiding unstable areas and applying BMPs in areas with poor soils would also reduce impacts. Intensive management of surface disturbing actions within the Muddy Creek would add additional protection for the watershed function of Jep Canyon ACEC/WHMA upstream of 303d-listed stream reaches on Muddy Creek.

Wildlife habitat management would include intensive management of surface disturbing and disruptive activities in RCAs to avoid or reduce physical habitat loss and disruption of normal raptor activity. Reduced disturbance to nesting habitat or raptors promotes maintenance or improvement in nesting and fledgling success rates. Distance and timing restrictions on human activity protect aspen and rock outcrop nest substrates and assure adequate opportunity for raptors to propagate successfully. Timing restrictions on surface disturbing and disruptive activities in crucial elk winter range would ensure that elk are able to maintain body condition necessary to survive even difficult winters. In addition, incorporating wildlife habitat objectives in reclamation activities and maintaining or returning connectivity between large contiguous blocks of undisturbed habitat would maintain winter habitat quality and quantity necessary to sustain WGFD herd objectives within the ACEC/WHMA.

4.13.4.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality management, cultural resources management, forest management, paleontology management, recreation management, SD/MAs other than the Jep Canyon ACEC/WHMA, and wild horse management would have little or no impacts on the Jep Canyon ACEC.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives above.

Avoidance of utility/transportation systems in areas with important resource values would retain the values for which the ACEC was designated. Should situations arise where the ACEC could not be avoided, additional BMPs would be applied to minimize disturbance. Wind energy projects would be excluded from within the boundaries of the ACEC, which would limit the placement of these facilities within good to excellent potential areas. Important wildlife habitats and the wildlife that inhabit the area would not be disturbed. The topography of the Jep Canyon ACEC would, in most cases, preclude the consideration of large linear facilities. Small, linear ROWs required to access oil and gas development facilities would result in surface disturbance and loss of habitat similar to that described in impacts from oil and gas development in the Impacts Common to All Alternatives section above and Alternative 1 oil and gas development impacts described below.

An existing communication site on private land within the Jep Canyon ACEC and the potential consideration of new towers would create collision hazards for raptors utilizing thermals along the ridge top to travel or hunt. The construction or maintenance of towers would result in short-term stress and disruption of normal elk use and travel patterns in the immediate vicinity of the towers or access road.

Grazing systems and range improvements designed to meet standards for rangeland health would provide the opportunity for maintenance or improvement of desired range conditions that support a diversity of wildlife. Intensive grazing management and associated range improvements, either in place or planned for future implementation, would provide control of livestock grazing use levels on elk crucial winter range. Fences and water developments that consider elk requirements would ensure that elk retain access and travel routes to crucial ranges and that livestock use levels are controlled to retain adequate herbaceous vegetation on crucial winter ranges when elk arrive. Construction of new fences or modification of existing fences that comply with BLM standards would provide for adequate big game passage. Some minimal loss of individual animals is anticipated where fences cross drainages or weather creates situations or conditions that put animals at additional risk when crossing fences.

Minerals impacts for oil and gas, geophysical exploration, and locatable minerals would be similar to those described under Impacts Common to All Alternatives above. Should the Jep Canyon area be opened to locatable mineral entry, plans of operation required for locatable mineral exploration and development (except casual use) would provide the BLM with the opportunity to influence how exploration activities occurred. Any surface disturbance connected with minor locatable mineral activity would increase the potential for introduction of noxious or invasive plant species that would degrade crucial winter range habitat by introducing plants that have lower quality or nutritional value than native forage plants. Areas open to locatable mineral entry that are also open to mineral material disposals would not be considered for mineral material disposal if the action would negatively impact sensitive resources.

Surface disturbance would increase the potential for introduction of invasive plant species that could invade crucial winter range habitat and reduce habitat quality and forage availability. The possible lack of operator commitment on private and state lands to implement stipulations and/or BMPs would result in increased habitat disturbance, wildlife disruption, and weed infestation on public, private, and state lands.

Although OHV management limits OHVs to designated roads and vehicle routes, OHV activities result in increased human presence and would have a moderate localized impact on wildlife species. Impacts to big game species would include displacement, altered seasonal use patterns, increased stress during critical time periods, and degradation of habitat. OHV use within riparian areas and stream channels would also have negative impacts on bank stability and riparian vegetation. OHV use on steep slopes and unstable soils would also increase erosion. Human presence and activity related stresses to wildlife would be

anticipated to be more frequent in the Jep Canyon area because of its proximity to one of the larger communities in the RMPPA. On the other hand, the U.P.R.R. checkerboard land pattern and the private land access restrictions in the area may reduce this impact. In addition, offroad vehicular travel for "necessary tasks" would result in minor vehicle damage to native plants and some displacement or disruption of normal wildlife activity. These impacts would be isolated and primarily occur during the summer months when disturbance to wildlife would have a much lower effect. Retrieval of big game kills would result in similar impacts; however, the impacts would only occur for a short period of time during the fall hunting season.

Recreation management activities such as hiking, camping, hunting, shed-antler hunting, and sightseeing that result in human presence would increase the potential for big game wildlife displacement. Owing to the high number of wildlife species that the habitat supports, there is a high likelihood of human presence within the area. Recreation activities would occur throughout the year, and they would result in minor displacement and heightened stress or flight response that would preclude animals from normal relaxed activities that allow for maintenance of optimum body condition. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Geist 1978).

The acquisition of adjacent lands or easements to improve public access would not be considered. The lands within the Jep Canyon ACEC are part of the U.P.R.R. checkerboard land pattern, and the intermingled land ownership pattern reduces the BLM's ability to effectively manage public use of the area.

VRM classes define allowable visual intrusions of management actions. The Jep Canyon area is listed under VRM Class II and Class III. Class II objectives are to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Class III allows management activities that partially retain the existing character of the landscape. Developmental activities such as gas development and range improvements may have mitigation measures involving color and height or may be restricted in other ways.

Intensive management of all surface disturbing and disruptive activities within the Jep Canyon area would prevent the loss or function of important elk crucial winter range or raptor nesting habitat. BMPs (Appendices 14, 15, and 18) and appropriate reclamation of surface disturbance (Appendix 36) applied to individual project proposals on a case-by-case basis would result in impacts similar to those resulting from oil and gas development noted above.

Retention of the Jep Canyon ACEC designation would provide little in the way of improved management opportunity. The Jep Canyon area is located within the checkerboard land pattern, which complicates public land management of any kind. Management efforts directed toward wildlife and wildlife habitat is difficult when private land goals do not parallel or are not necessarily compatible with public land multiple-use goals and objectives. The checkerboard land pattern is difficult to manage, especially for wildlife habitat which is more effectively managed in large, contiguous blocks of habitat. Management actions would need to be coordinated between BLM and other surface owners. Surface disturbing and disruptive activities that are not coordinated among various land ownerships could influence wildlife daily activity, migration routes, and use of critical habitat such as aspen stands and/or windblown crucial winter use areas. In some situations, wildlife could be displaced to lower quality range that does not provide the necessary habitat components or sufficient quantity of required habitat components necessary for adequate maintenance of body condition or fitness.

Vegetation treatment (e.g., prescribed burning, plantings, seedings, and chemical, mechanical, biological, and grazing treatments) of native rangeland would improve the health and function of native plant communities. Improvement of wildlife habitats such as crucial elk winter range has been greatly enhanced through prescribed burning. The Jep Canyon pasture was burned in 1999, and burning the upper portion of the canyon is planned for the future. Recent treatments have resulted, and future treatments would result, in direct improvement of elk crucial winter range by increasing herbaceous forage quantity and quality.

Vegetation treatments would have short-term impacts on the ACEC by reducing vegetation cover and increasing localized soil erosion. However, over the long term, vegetation treatments would enhance plant vigor, vegetation cover, and species diversity. Any vegetation treatment would be designed to increase forage and habitat for wildlife species and to maintain rangeland health and the desired plant communities of the area.

Water quality, watershed, and soils management action authorizing surface discharge of produced water during natural gas or oil extraction would change the physical hydrology of receiving waters, impact water quality, and possibly create additional temporary water sources or evaporation/percolation pits that would require reclamation upon project completion.

Spatial buffers, timing restrictions, and other BMPs applied to surface disturbing and disruptive activities for raptors, RCAs, and big game would all contribute to the maintenance of adequate habitat to support relevant and important wildlife values within the Jep Canyon area. Various restrictions and BMPs designed to address both general wildlife needs and critical seasonal requirements would influence the timing and location of surface disturbing and disruptive activities. Surface disturbing and disruptive activities allowed in big game migration and transitional ranges could disrupt normal wildlife movement between seasonal ranges. Recreational use controlled by limited access to private land would result in only minor disruption of normal wildlife activity except during established hunting seasons.

Intensive management for sensitive species, mountain plover, sage-grouse, neo-tropical and other migratory birds, upland game bird species, amphibian species, reptile species, and habitats would indirectly and directly protect a diversity of species during critical time periods throughout the year by limiting human presence and associated surface disturbing and disruptive activities (see Section 4.19, Wildlife and Fisheries, for additional impact analysis related to specific wildlife management actions). These management actions would support the diversity of wildlife species present in the area that contribute to a thriving ecologically rich environment.

Summary

Impacts on the Jep Canyon ACEC from most management actions would not be detrimental to the crucial elk winter range and the productivity of raptor nesting pairs. Oil and gas exploration and development activities on both public and private checkerboard lands has the most likelihood of resulting in significant impacts if development levels push elk out of crucial habitats and into lower quality environments. Past management has perpetuated relevant and important values of the ACEC. Future effects on big game and raptor populations are dependent on the level and extent of successful oil and gas exploration and development.

4.13.4.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality management, cultural resources management, forest management, paleontology management, recreation management, SD/MAs other than the Jep Canyon ACEC/WHMA, and wild horse management would have little or no impacts on the Jep Canyon ACEC.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives above.

Water quality, watershed, and soils management impacts would be the same as those described under Alternative 1 above.

Impacts related to development of wind energy facilities or utility transportation systems would disturb both crucial elk winter range and raptor nesting habitat. Proposals to build wind energy facilities on Atlantic Rim have already been received and if approved would create collision hazards for raptors using the area for nesting, traveling, or hunting. Construction and maintenance of these facilities would result in long-term stress and disruption and/or complete avoidance of elk along ridge tops that are important winter range.

Although the topography of most of the Jep Canyon ACEC/WHMA would in most cases preclude the consideration of large linear facilities, smaller ROWs could be proposed. These linear ROWs, which are required to access oil and gas development facilities, would result in surface disturbance and loss of habitat as described in impacts from oil and gas development in the Impacts Common to All Alternatives section above and the oil and gas development impacts described in Alternative 2 below.

Development of further communication sites in addition to the existing tower would result in impacts similar to those described in Alternative 1.

Impacts from livestock grazing would be similar to those under Alternative 1; however, there would be more emphasis on livestock production. This would result in additional water developments and fencing to accommodate larger numbers of livestock. Increased livestock numbers would increase upland vegetation use and thereby reduce available forage for wintering elk. The increased livestock use would also reduce herbaceous forage available to small mammals that are important for the raptor food base. Fencing would create additional barriers to movement of wildlife and increase stress, energy loss, and mortality.

Because resource development is the priority of this alternative, impacts from oil and gas leasing would be in addition to those described in Impacts Common to All. Intensive development of conventional oil and gas as well as CBNG would not sustain important habitats necessary for big game populations, especially elk. Oil and gas activity related to maintenance would be necessary during critical time periods and would result in wildlife displacement. Elk are extremely sensitive to human presence and would likely abandon the Jep Canyon ACEC/WHMA if it were fully developed. Other wildlife species would suffer increased stress, displacement, and lower reproductive success.

More surface disturbance would increase the potential for introduction of invasive plant species, which could invade crucial winter range habitat reducing habitat quality and forage availability. The possible lack of operator commitment on private and state lands to implement stipulations and/or BMPs would result in increased habitat disturbance, wildlife disruption, and weed infestation on public, private, and state lands.

Although locatable mineral entry would be allowed, impacts would be similar to those described in Impacts Common to All Alternatives. The RFD for locatable mineral development is small, and steep topography reduces the opportunity for development in some areas; therefore, impacts to wildlife as a result of implementing these actions would be relatively minor. Areas open to locatable mineral entry would also be open to mineral material disposals. Mineral materials disposals are discretionary actions, and the BLM would not authorize actions that would negatively impacts resources, such as elk and raptors.

Impacts from OHV use would be similar to Alternative 1, with the exception of increased vehicular traffic related to increasing development. The area would be open to over-the-snow vehicles. As has happened in this area in the past, more traffic on roads tends to increase the number of roads and the formation of new roads on private lands and adjacent public lands. Additional roads result in loss of vegetation and associated increases in erosion. Such impacts would further disturb wildlife in the area.

Recreation management activities would be the same as those described under Alternative 1.

The Jep Canyon ACEC designation would not be maintained and the area would be managed as a WHMA. However, complications related to the checkerboard land pattern would result in impacts similar to those described in Alternative 1.

Surface disturbing activities would not be intensively managed in aspen communities and would reduce habitat diversity and displace wildlife from preferred habitats. Management of aspen stands to increase distribution and improve seral structure would not occur. Decadent aspen stands would not be treated, possibly because of surface disturbance, and the condition of some mature stands would continue to decline. Stand regeneration would be dependent on wildland fires to replace stands. Aspen stands may disappear completely in certain areas without active management, resulting in the loss of important aspen habitat to wildlife.

The acquisition of adjacent lands or easements to improve public access would not be considered. The lands within the Jep Canyon ACEC are part of the U.P.R.R. checkerboard land pattern, and the intermingled land ownership pattern reduces the BLM's ability to effectively manage public use of the area.

VRM impacts would be the same as those described under Alternative 1.

Wildlife habitat management practices for surface disturbing activities would be similar to those identified in Alternative 1; however, there are no seasonal or temporal timing stipulations for species that are essential to protect a diversity of species during critical periods throughout the year. Protective measures including NSOs for raptor nests and greater sage-grouse leks, BMPs for neo-tropical and other migratory birds, upland game bird species, amphibian species, reptile species, sensitive species and their habitats, crucial winter range and parturition timing stipulations for big game species and breeding, nesting, and winter timing stipulations for greater sage-grouse would not be implemented, and surface disturbing and disruptive activities would be allowed in these habitat types. These protection measures are greatly decreased compared to those identified in Alternative 1; therefore, the potential for impacts on wildlife, specifically raptors and big game species, during certain times of the year would increase and disrupt wildlife during critical time periods. Human presence may result in movements of wildlife to lesser quality habitats or alterations from traditional migration and dispersal routes.

Summary

Reduction in restrictions under this alternative would decrease protection of aspen habitat, crucial elk winter habitat, and productivity of raptor nesting pairs. Impacts from surface disturbing activities would include habitat loss, degradation, fragmentation, and displacement of wildlife. The lack of intensive management and use of BMPs within the area under this alternative would reduce the ability to protect wildlife and habitat types required for population stability and/or growth.

4.13.4.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, cultural resources management, forest management, paleontology management, recreation management, SD/MAs other than the Jep Canyon ACEC/WHMA, and wild horse management would have little or no impacts on the Jep Canyon ACEC.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives above.

Wind energy facilities, utility/linear transportation facilities, and communication sites would have the same impacts as those described in Alternative 1, with the exception that the avoidance area restriction would be used to avoid placement of facilities and the area would not be designated an ACEC.

Livestock grazing impacts would be the same as those described under Alternative 1.

The area would be closed to new oil and gas leasing. Surface disturbing and disruptive activities on existing leases would be intensively managed to meet the objectives of the WHMA. Intensive management and use of BMPs within the area would minimize impacts to wildlife on public lands, although they would not completely eliminate impacts.

Public lands would continue to be closed to locatable mineral entry and operation of the public land laws, including sale. Withdrawals would be pursued. Those areas closed to locatable mineral entry would also be closed to mineral material disposals thereby resulting in no impacts to wildlife habitat.

Offroad vehicular travel for “necessary tasks,” as well as off road travel to retrieve big game and to access campsites, as well as offroad travel for over-the snow vehicles, would not be allowed. Exceptions would be considered on a case-by-case basis. OHV use would be limited to designated roads and vehicular routes. Disturbance or removal of vegetation would not occur, new roads would not be created, and wildlife would spend less energy avoiding the human presence. During critical winter periods, closure to over-the-snow vehicles would eliminate unnecessary movements of big game during critical winter periods when energy reserves of the animals are crucial. These limitations would minimize displacement of wildlife and damage to forage and habitat, and limit disturbance or stress during crucial time periods. In addition, the Jep Canyon area may have seasonal restrictions or travel limitations applied, as necessary, to protect wildlife resources. Temporary, winter closures to vehicle travel would eliminate human use and presence in areas important as winter or crucial winter wildlife ranges. OHV seasonal restrictions would also reduce visual and audible disturbances to wildlife that often result in rapid escape or avoidance actions that may lead to wildlife fleeing or moving to lower quality habitats and expending energy needed for normal winter maintenance.

Recreation management impacts would be the same as those described under Alternative 1.

The Jep Canyon ACEC designation would not be maintained and the area would be managed as a WHMA. This designation would not affect management in the area—unless the checkerboard lands were acquired—because of difficulties in managing habitat when private lands are not managed by the BLM.

Vegetation treatments would be implemented placing more emphasis on achieving DPC related to wildlife. Elk crucial winter range would continue to be treated to ensure both amount and sustainability of important herbaceous forage. Vegetation management of aspen stands for improved distribution and seral structure would provide additional habitat for raptors and big game species. Aspen woodlands would be identified for treatment to restore the health and vigorous growth in over-mature and decadent aspen stands to benefit both elk crucial winter range and hiding/thermal cover. Vegetation treatments would

minimize area-wide habitat loss, degradation, fragmentation, and/or displacement of wildlife as habitat quality declines.

As opportunities arise, the acquisition of adjacent lands or easements to improve public access would be considered. Actions on private lands may negatively affect the Jep Canyon ecosystem and may impact wildlife species by disturbing them during critical time periods, especially in elk calving and crucial winter range habitat. The acquisition of adjacent lands or easements, especially within the checkerboard, could enable the BLM to manage larger, more consolidated blocks of habitat associated with particular species or habitat. Particular emphasis and value would be placed on lands that could expand or buffer areas of important wildlife habitat such as migration corridors, crucial winter ranges, brood rearing areas, rookeries, or other important or sensitive areas of habitat that would be determined on a case-by-case basis. Cooperation with adjacent landowners would also improve public access and increase recreational opportunities. However, increased human presence could cause more disturbances to wildlife feeding, resting, and other activities. It could also introduce invasive plant species.

VRM would be the same as that described under Alternative 1.

Surface disturbing and disruptive activities in aspen communities within the Jep Canyon area would be restricted or prohibited, which would prevent the loss or function of important elk crucial winter range or raptor nesting habitat.

Water quality, watershed, and soils management would not authorize surface discharge of produced water during natural gas or oil extraction in this area. Therefore, impacts would be avoided such as changes in the physical hydrology of receiving waters, water quality changes, and the creation of additional temporary water sources or evaporation/percolation pits that would require reclamation upon project completion. Large water impoundments would not be allowed in this area, thereby protecting the surface resources from inundation.

Wildlife and fisheries management actions would be similar to Alternative 1; however, additional measures for wildlife protection would be implemented under this alternative. Raptor protection measures with a 1.5-mile buffer are extended from February 1 to September 15 and are species-dependent; the raptor NSO to protect nests extends to 1/4-mile buffer protection. RCAs would be closed to oil and gas leasing and activities on existing leases would be intensively managed. Surface disturbing and disruptive activities would be prohibited within big game parturition areas and sensitive species habitat and would be managed in migration and transitional ranges. BMPs would be implemented in crucial winter range, and water developments would not be authorized in crucial winter range. Greater sage-grouse breeding and nesting habitat protection is extended from March 1 to July 15 with additional programs, and winter habitat protection extends from November 15 to March 14. These management actions decrease and/or remove negative impacts to species during critical time periods.

These actions would protect a diversity of species during critical time periods throughout the year and help ensure the protection of wildlife and associated habitat by limiting human physical presence and associated disturbances. Surface disturbing activities and human presence may result in alterations of wildlife habitat selections, specifically during migration and sensitive time periods such as nesting or brood-rearing, which would negatively impact wildlife by disturbing them. Surface disturbing activities, however, would be managed in migration and travel corridors. After projects are implemented, there may continue to be disturbance to habitat use by wildlife because of the maintenance needs of the project. These impacts would include alterations to traditional migration and dispersal routes from disturbance to habitat and/or disturbance from human activities that occur in the area, avoidance of crucial or preferred habitats, and limitation on the uses of important habitat areas for species throughout various life stages

within a year. Monitoring would be required to assess the impacts these disturbances would have on wildlife, and BMPs would be utilized to reduce and/or remove these impacts.

Summary

Under this alternative, opportunities to further improve current public access would be pursued, which would increase related impacts to wildlife habitat within the Jep Canyon WHMA. This alternative would expand and diversify aspen woodlands, which would provide additional habitat for nesting raptors and other wildlife. However, this alternative has more restrictive management of minerals activities and offroad vehicular travel for "necessary tasks." In addition, all impacts associated with surface disturbing and disruptive activities would be minimized through intensive management and implementation of BMPs. Therefore, impacts to wildlife and habitat within the Jep Canyon WHMA from other management actions would not be significant to the crucial elk winter range and the productivity of raptor nesting pairs. In addition, relevant and important values of the WHMA would be protected under this alternative.

4.13.4.5 Impacts Under Alternative 4: Proposed Plan

Air quality management, cultural resources management, forest management, paleontology management, recreation management, SD/MAs other than the Jep Canyon ACEC/WHMA, and wild horse management would have little or no impact on the Jep Canyon WHMA.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives.

Wind energy facilities, utility/linear transportation facilities, and communication sites would have the same impacts as those described in Alternative 1, with the exception that the avoidance area restriction would be used to avoid placement of facilities and the area would not be designated an ACEC.

Livestock grazing management, oil and gas leasing, geophysical exploration, locatable and common variety minerals, water quality, watershed and soils would have the same associated impacts described under Alternative 1.

Offroad vehicular travel for "necessary tasks" would be the same as Alternative 3. In addition, OHV use would be restricted to designated roads and vehicle routes and would be closed to over-the-snow vehicles as described in Alternative 3.

Recreation management impacts would be the same as those described under Alternative 1.

The Jep Canyon ACEC designation would not be maintained and would be managed as a WHMA, as discussed in Alternative 3.

Vegetation management actions would be the same as those described in Alternative 3.

The acquisition of adjacent lands or easements to improve public access would not be considered. Impacts would be the same as those identified under Alternative 1.

VRM would be the same as in Alternative 1.

Surface disturbing and disruptive activities in aspen communities within the Jep Canyon area would be avoided, which would help prevent the loss or function of important elk crucial winter range or raptor nesting habitat.

Wildlife and fisheries management actions would include species-specific buffers and seasonal or temporal timing stipulations for wildlife species similar to Alternative 1; however, additional measures for wildlife protection would be implemented under this alternative. Raptor protection measures are extended from February 1 to September 15, surface disturbing and disruptive activities would be managed in migration and transitional ranges, BMPs would be implemented in crucial winter range and greater sage-grouse breeding and nesting habitat, and greater sage-grouse breeding and nesting habitat protection is extended from March 1 to July 15 with additional programs and winter habitat protection extending from November 15 to March 14. These actions will protect a diversity of species during critical time periods throughout the year and help ensure the protection of wildlife and their associated habitat by limiting human physical presence and associated disturbances. Surface disturbing activities and human presence may result in alterations of wildlife habitat selections, specifically during migration and sensitive time periods such as nesting or brood-rearing. These alterations can negatively impact wildlife by disturbing them; however, surface disturbing activities will be managed in migration and travel corridors. It should be noted that stipulations are utilized when surface disturbing and disruptive activities occur to reduce impacts during these time periods. However, after projects are implemented there may be some disturbance to habitat use, alterations from traditional migration and dispersal routes, avoidance of crucial or preferred habitats, and limitation on the uses of important habitat areas for species throughout various life stages within the year after project implementation. Monitoring would be required to assess the impacts these disturbances would have on wildlife, and BMPs would be utilized to reduce and/or remove these impacts.

Summary

This alternative has more restrictive management of minerals activities that affect wildlife habitat than continuing existing management. All impacts associated with surface disturbing and disruptive activities would be minimized through intensive management and implementation of BMPs. Designation of Jep Canyon ACEC as a WHMA would not be a significant change from Alternative 1. Overall, impacts on the potential Jep Canyon WHMA from other management actions would not be significant to the crucial elk winter range and the productivity of raptor nesting pairs. The relevant and important values of the WHMA would be protected under this alternative.

4.13.5 Shamrock Hills ACEC/WHMA

4.13.5.1 Impacts Common to All Alternatives

Management actions would be designed to minimize conflicts with adjacent landowners and to enhance the natural resource values of the area to meet management objectives. Air quality management, cultural resource management, forest management, livestock management, OHV management, paleontology management, other SD/MAs, socioeconomics, transportation and access management, vegetation management, VRM, water quality, watershed and soils management, and wild horse management would have little or no impacts on the Shamrock Hills area.

The checkerboard land ownership pattern in the area reduces BLM’s ability to effectively manage for wildlife habitat. Surface disturbing activities on private lands are not subject to the same restrictions and stipulations for preservation of wildlife habitat as are similar activities on public land. The impacts of these actions on private lands might carry over to adjacent BLM lands and reduce the quality of wildlife habitat and forage.

Wildland fire suppression would reduce the acreage burned during times of the year when fire is the most damaging to vegetation and soils. Some wildland fires would have the potential to completely remove vegetation that protects the soil from increased surface flows and erosion, kill root crowns of sprouting

species, and in some cases sterilize soils for extended periods. Designing fire and fuels management actions to manipulate vegetation in a more controlled, predictable manner would decrease the potential for catastrophic wildland fires. Treatments would be conducted periodically to create or increase the mosaic pattern of vegetation that would minimize the size of wildland fires. Treatments would also be designed to diversify shrub communities, which would improve vegetation health, forage production, and soil stability resulting in reduced potential for erosion and an increase in quality of wildlife habitat in the area.

Land and realty actions would be intensively managed within the management area. In situations where these areas could not be avoided, BMPs and mitigation measures would minimize disturbance to the values of the RCA. These measures would ensure protection of nesting substrates for raptors, vegetative communities, and other wildlife species by eliminating the potential for surface disturbance from land and realty actions.

Areas with rock outcrops, thick stands of sagebrush or uneven topography are suitable types of habitat for nesting raptors. If ROW actions crossed areas, suitable nesting substrates would be removed and/or compromised, increasing the potential for nestling and fledgling mortality. Sage-grouse and pronghorn rely on large thick stands of sage, uneven topography, and rock outcrops for winter cover and food. Removal of winter cover (i.e., rock outcrops) and food from realty actions would increase mortality rates, especially for young and older animals.

The Shamrock Hills ACEC lies within areas of low potential for oil and gas development, but the area is currently leased. The likelihood of the area being developed is moderate, based on current industry proposals adjacent to the area. The primary type of gas extraction within the area would be CBNG. In most cases, CBNG extraction would require 80-acre well spacing with minimal potential for directional drilling because of the shallow depths of the gas-bearing coals. Conventional gas drilling would not necessarily require 80-acre spacing of gas wells, and there would be opportunities for directional drilling. There would also be opportunities to collocate conventional gas wells with coalbed natural gas wells. Oil and gas development would include direct loss of raptor and pronghorn habitat because of well pads, roads and related infrastructure, degradation of adjacent habitats from wind-borne dust, and fragmentation of habitat and displacement of wildlife species from areas disturbed by authorized oil and gas activities and related human presence. Intensive management of new and existing oil and gas leases would provide some protections to nesting raptors, sage-grouse, wintering pronghorn, and other wildlife species.

Although the Shamrock Hills ACEC/RCA is in the checkerboard land pattern, the area still experiences some recreational use. Recreational activities such as hiking, camping, hunting, shed-antler hunting, and sightseeing that result in human presence would increase the potential for wildlife displacement. Owing to the high number of wildlife species that the habitat supports, there is a high likelihood of human presence within the ACEC. Recreation activities would occur throughout the year and would result in displacement and heightened stress or flight response that would preclude animals from normal activities that allow for maintenance of optimum body condition. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Geist 1978).

Wildlife and fisheries management activities would intensively manage surface disturbing and disruptive activities within the Shamrock Hills ACEC/RCA. This would ensure protections to a diversity of wildlife and their associated habitat. The application of BMPs (Appendix 15) and the Biological Opinion (Appendix 14) would protect the habitat of raptors, sage-grouse, and pronghorn, as well as other species that inhabit the area.

4.13.5.2 Impacts Under Alternative 1: Continuation of Existing Management

The Shamrock Hills ACEC (18,400 acres) (Map 2-7) would be maintained under this alternative. Air quality management, cultural resource management, forest management, livestock management, paleontology management, recreation management, other SD/MAs, socioeconomics, transportation and access management, VRM, water quality, watershed and soils management, and wild horse management would have no or negligible impacts on the Shamrock Hills ACEC. Management under this alternative would maintain the productivity of nesting raptor pairs, especially ferruginous hawks, and other wildlife species. This would ensure the reproductive viability of wildlife species within the ACEC.

Wildland fires would be managed for AMR, which would most often result in suppression. In areas where agreements have been reached with private landowners, however, the use of wildland fire for resource benefit would be implemented. This would reduce the likelihood of catastrophic wildland fire, enhance vegetation diversity, create structural and seral stage mosaic, and reduce decadent stands of sagebrush and upland shrubs. Reaching agreements to use fire to benefit wildlife would improve vegetation health, forage production, and increase the overall quality of wildlife habitat within the area. In addition, fire and fuels management would be the same as adjacent lands.

Exclusion of wind power facilities or avoidance of linear transportation facilities would retain the relevant and important values for which the ACEC was designated. Important wildlife habitats and the wildlife which inhabit the area would not be disturbed. The topography of the Shamrock Hills ACEC would, in most cases, preclude the consideration of large linear facilities. Small, linear ROWs required to access oil and gas development facilities would result in surface disturbance and loss of habitat similar to that described in impacts from oil and gas development in the Impacts Common to All Alternatives section above and Alternative 1 oil and gas development impacts described below.

Geophysical exploration within the designated ACEC would temporarily displace wildlife species, increase dust and noise, and increase human presence and vehicle traffic. In addition, offroad vehicular travel would compact soils and crush minor amounts of vegetation. These actions would temporarily reduce the quality of the vegetation communities and thereby temporarily degrade the big game crucial winter range and raptor and grouse nesting habitats. Timing restrictions on geophysical activities would preclude activity during those times of the year when wildlife are most susceptible to disturbance, thereby reducing the overall impact of the actions.

The Shamrock Hills ACEC is open to locatable mineral entry and mineral material disposals. A plan of operation would be required for locatable mineral exploration and development (except casual use) which would provide the BLM with the opportunity to influence how exploration activities occur. Any surface disturbance connected with minor locatable mineral activity would increase the potential for introducing noxious or invasive plant species. Permitting invasive plants would degrade crucial winter range habitat by introducing plants that have lower quality or nutritional value than native forage plants. Mineral material disposals are discretionary actions and would not be considered if the actions were to negatively affect sensitive resources.

Impacts associated with vehicle use for “necessary tasks” would be the same as those described for vehicular traffic associated with oil and gas management in the above minerals discussion. Impacts associated with OHV use on existing roads, over-the snow vehicle use, big game retrieval, and to access campsites would result in displacement and increase stress to wildlife when these activities occur in crucial habitat or during critical time periods. Use of OHVs during wet periods would remove vegetative cover and create scars on moderate to steep slopes that would become erosional channels and increase sediment delivery into drainages. Noise associated with OHV use would result in increased nest abandonment and decreased nestling survival, potentially resulting in declassification as an RCA.

Vegetation management actions would result in some weed treatments. Noxious and invasive species control during critical times would cause disturbance and stress to wildlife. Most control programs are initiated during late spring through the summer when juvenile animals are most vulnerable. However, the control of weed species would maintain native vegetation that provides critical habitat for wildlife species. Impacts to the ACEC would be minimal because of the lack of current weed populations, application of BMPs, and current seasonal restrictions.

Spatial buffers, timing restrictions, and other BMPs designed to address both general wildlife needs and critical seasonal requirements would influence the timing and location of surface disturbing and disruptive activities within the ACEC. Intensive management for sensitive species and habitats would indirectly protect a diversity of species in the area throughout the year by limiting human presence and associated surface disturbing and disruptive activities. These management actions would support the diversity of wildlife species present in the ACEC that contributes to the relevant and important values.

Summary

Surface disturbing activities resulting from lands and realty management, minerals management, and OHV management would potentially remove and degrade portions of the vegetation communities that support numerous raptor pairs, pronghorn during critical times, and grouse. Intensive management of these activities would help reduce, but would not eliminate, these impacts. The restrictions on surface disturbing and disruptive activities under this alternative would allow for degradation of wildlife habitats resulting in displacement from large segments of the area. Recreation activities would cause displacement and increase energy costs that result in reduced animal fitness and reproductive potential.

Some aspects of livestock grazing management, vegetation management, and wildlife management would help preserve some of the vegetation communities that support the abundance of wildlife in the area for which the area was originally designated as an ACEC.

4.13.5.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The area would be managed as a WHMA. Air quality management, cultural resources management, forest management, livestock management, paleontology management, recreation management, other SD/MAs, socioeconomics, transportation and access management, VRM, water quality, watershed and soils management, and wild horse management would have little or no impacts on the Shamrock Hills ACEC.

Impacts from fire and fuels and OHV management would be the same as those described under Alternative 1.

While the area would be an avoidance area for wind energy development, communication sites, and utility/transportation systems, the potential still exists for development to occur because portions of the WHMA lie within outstanding potential for wind energy (Map 3-2). These actions would create hazards to wildlife and produce visual intrusions to the setting. In addition, actions would remove portions of the vegetation community and thereby degrade the big game crucial winter range and for the raptor and grouse habitats provided by this vegetation community. In situations where these areas could not be avoided, BMPs and mitigation measures would minimize disturbance to the values of the RCA. These measures would ensure protection of nesting substrates for raptors, protection of other wildlife species, and protection of vegetative communities by eliminating the potential for surface disturbance from land and realty actions.

Impacts from minerals management and associated lands and realty management actions would be the same as those described in Alternative 1. However, development actions would not be seasonally

restricted resulting in a greater impact to wildlife and associated habitat than Alternative 1. Development would be allowed to occur within pronghorn crucial winter range during the winter months, within big game parturition areas, adjacent to sage-grouse leks, and within raptor nesting areas. BMPs would not be applied to development projects; there would be a greater degree of loss, degradation, and fragmentation within the important sagebrush, mountain shrub, and aspen habitats. Degradation of critical habitats, increased wildlife stress, displacement of species to lower quality or less preferred habitat, lower reproductive success, and increased mortality of wildlife would result in loss of the values that would qualify the Shamrock Hills area as a WHMA.

A plan of operation for locatable mineral exploration and development would be required only for surface disturbance of 5 acres or more. This would result in small-scale loss of habitat in discrete locations that would collectively affect the qualities of the area as a WHMA. However, the reasonably foreseeable development for these types of actions is low, thus impacts would be minimal. In addition, areas open to locatable mineral entry would also be open to mineral material disposals. However, these actions are discretionary and the BLM would not authorize actions that would negatively impacts resources such as raptors, sage-grouse, and pronghorn.

The priority for noxious and invasive species control on BLM lands would be concentrated in areas where commodity benefits would be enhanced. Because of the lack of current weed population management, actions would be the same as those described in Alternative 1.

Reducing or eliminating timing and distance stipulations from wildlife and fisheries management would have a significant impact on wildlife populations within the area. An increase in surface disturbing and disruptive activities within critical areas or during crucial periods would disturb and disrupt wildlife species. Raptor and sage-grouse nest abandonment/failure, increased amounts of stress to wintering pronghorn, and wildlife displacement would cause declines in population numbers. Therefore, this unique area would see a decline in the characteristics that qualify it as a WHMA/RCA.

Summary

Because of less restrictive wildlife protection measures (i.e., lack of timing and spacing restrictions), impacts from lands and realty management, and minerals management (including oil and gas development) would be increased compared with Alternative 1. These impacts would escalate to significant levels if development and other disruptive activities removed or degraded wildlife habitat to levels that render it uninhabitable for species of concern. The actions proposed in this alternative would result in a loss of the values that would qualify the Shamrock Hills area as a WHMA.

4.13.5.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, cultural resource management, forest management, livestock management, paleontology management, recreation management, other SD/MAs, socioeconomics, transportation and access management, VRM, water quality, watershed and soils management, and wild horse management would have no or negligible impacts on the Shamrock Hills RCA.

Impacts from fire and fuels management and vegetation management would be the same as those described under Alternative 1.

Closure of the area from operation of the public land laws would not allow any type of realty action to occur. The vegetation communities that provide wildlife habitat would by protected from disturbance associated with wind energy development, communication site development, and all other types of realty

actions. No lands and realty development projects would be allowed within the RCA, ensuring that there would be no disturbances to wildlife species and associated habitat from these types of actions.

Impacts from minerals management would be the same as those described in Alternative 1, except the Shamrock Hills RCA would be closed to locatable mineral entry and mineral material disposals. Closure of the area to locatable mineral entry would reduce habitat loss and fragmentation, degradation of adjacent habitat from wind-borne dust, and displacement of wildlife species from surface disturbing and disruptive activities.

Prevention of offroad vehicular travel for "necessary tasks," retrieval of big game kills, and to access campsites would result in fewer disturbances to wildlife habitat and forage. This action would maintain forage and habitat for raptors, grouse, and big game. Because there would be less human disturbance to wildlife, there would be decreased energy costs and improved animal fitness and reproductive potential compared to Alternative 1.

The area would be managed as a raptor concentration area (Table 2-1). The land ownership pattern of the area reduces the BLM's ability to effectively manage for wildlife habitat under the ACEC designation. Management prescriptions outlined in Table 2-1 for wildlife protection and intensive management of all surface disturbing and disruptive activities would adequately protect the values of the area under the RCA designation. Prevention of offroad vehicular travel for "necessary tasks" would result in fewer disturbances to wildlife habitat and forage. There would be a decrease in the amount of forage and habitat lost, thereby maintaining raptor and grouse nesting habitats and big game crucial winter range. Because there would be less human disturbance to wildlife, there would be decreased energy costs and improved animal fitness and reproductive potential compared to Alternative 1.

Impacts on the Shamrock Hills RCA from wildlife management would be the same as those under Alternative 1, except that more restrictive management actions to protect wildlife habitat (e.g., increasing buffer zones around greater sage-grouse and Columbian sharp-tailed grouse leks, greater seasonal restrictions and prohibitions on surface disturbing and disruptive activities) would provide a greater benefit to big game, raptor, and sage-grouse species and their associated habitats.

Summary

Actions related to lands and realty management, minerals management, and OHV management would impact the vegetation communities that support an array of wildlife within the RCA. Additional restrictions applied to surface disturbing and disruptive activities would result in the maintenance of wildlife habitat values. Vegetation management, wildlife and fisheries management, and some aspects of livestock grazing management would help maintain the vegetation communities that support the diversity of wildlife within the area.

4.13.5.5 Impacts Under Alternative 4: Proposed Plan

Air quality management, cultural resource management, forest management, livestock management, paleontology management, recreation management, other SD/MAs, socioeconomics, transportation and access management, VRM, water quality, watershed and soils management, and wild horse management would have no or negligible impacts on the Shamrock Hills RCA.

Fire and fuels management, OHV management and vegetation management would have the same impacts as those described under Alternative 1.

Impacts from minerals management would be the same as those described in Alternative 1, except for locatable mineral entry. Impacts from locatable mineral entry would be the same as those described in Alternative 2.

Impacts from lands and realty management would be the same as those described in Alternative 2.

Management of the Shamrock Hills RCA would be the same as those described for Alternative 3.

Impacts on the RCA from wildlife management would be the same as those identified under Alternative 1, except that more protective stipulations in the form of longer timing restrictions would be required for greater sage-grouse, sharp-tailed grouse, and raptors. The longer restrictions would better reflect breeding and nesting periods and would reduce potential disturbance and habitat loss and increase reproductive success of grouse within the RCA. Implementation of BMPs within big game crucial winter range would reduce stress to pronghorn. Raptor timing restrictions would also be altered to better reflect individual species' requirements. Such altered restrictions would increase protection for raptors during critical periods. Such measures would protect wildlife species and associated habitat and increase the overall quality of this unique area.

Summary

Management measures for the raptor concentration area would afford sufficient protection to relevant and important values identified for this area and for the associated wildlife species involved. Surface disturbing activities from lands and realty management, minerals management, and OHV management would remove and degrade portions of the vegetation communities that support numerous raptor pairs, pronghorn during critical times, and grouse. Intensive management of these activities would help reduce, but would not eliminate, these impacts. The limited restrictions on surface disturbing and disruptive activities under this alternative would allow for degradation of wildlife habitats resulting in displacement from large segments of the area.

Some aspects of vegetation management and wildlife and fisheries management would help preserve the vegetation communities that support the abundance of wildlife for which the area was originally designated as an RCA.

4.13.6 Stratton Sagebrush Steppe Research Area Potential ACEC

4.13.6.1 Impacts Common to All Alternatives

Air quality, forest management, paleontology, socioeconomics, other SD/MAs, visual resource, and wild horse management actions common to all alternatives would not likely impact management of the Stratton Sagebrush Steppe research area.

Cultural management actions for the avoidance, protection, or preservation of cultural sites and/or settings would influence the location of research sites or infrastructure in some cases. It is unlikely that research sites or infrastructure would coincide with cultural sites. Were that to occur, however, research sites would likely be relocated to new locations that would meet research goals while avoiding direct impacts.

The Stratton Sagebrush Steppe research area would be managed as an AMR suppression area because of the intermixed landownership within the area (BLM lands surround Wyoming state land along Beaver Creek). If wildland fires were to occur, suppression activities would possibly compromise vegetation plots and damage infrastructure such as snow fences or instrumentation used for studies. These impacts would be reduced by the presence of a resource advisor familiar with the values and infrastructure within

the Stratton area during wildland fire suppression The fuel types in the Stratton area are mostly herbaceous and shrub species; therefore, suppression efforts would most likely be successful and the impacts from fire and fuels would likely be negligible. Because of the low potential for wildland fires damaging to resources, fire and fuels management actions that use wildland fire (i.e., non-suppression within AMR) to reduce fuel loads would not likely occur in this area.

Lands and realty management actions include the avoidance of the Stratton area when locating utility/transportation systems and wind power projects. Avoidance of surface disturbing activities not connected to or involved with ongoing research would maintain baseline vegetative conditions and improve the reliability and predictability of research data.

Livestock grazing is one of the multiple uses being studied in the Stratton research area; therefore, the ability to authorize livestock grazing is advantageous for achieving research goals. Exclosures built around facilities and weirs used to measure streamflow would limit disturbance to the buildings and weir ponds from livestock hoof action and rubbing. Authorized livestock grazing may result in damage to some research equipment and grazing in locations not useful for research projects because of the failure of some pasture or allotment fences. With proper maintenance of range improvements, this impact would be minimal.

OHV management would limit road use to designated roads and vehicle routes and would provide the most control of public travel and mitigate potential erosion and surface disturbance. Roads and vehicle routes closed in response to OHV activities that compromise the integrity of the research area would reduce erosion and resource damage that can result from poorly maintained roads and use of roads when soil conditions exacerbate problems.

Recreation management actions that facilitate dispersed recreation activities throughout the RMPPA would increase the potential for disturbance to the vegetation resources in the Stratton Sagebrush Steppe research area. Although impacts are expected to be minimal, the increased use of designated roads and vehicle routes may cause some localized vegetation removal and increased erosion to occur.

Stratton Sagebrush Steppe SD/MA actions would include the closure of the area to mineral material disposal. Vehicle travel limited to designated roads and vehicle routes under special management of the Stratton Sagebrush Steppe research area would protect the research qualities of the area by reducing future surface disturbance unrelated to research objectives. Limiting vehicle use to designated roads would apply to casual use by the public and not to offroad travel for “necessary tasks” such as fence maintenance or access to research plots. Changing the designation of roads with resource problems would allow for seasonal or permanent closures of roads and vehicle routes if necessary for the protection of research qualities of the area.

No other SD/MAs overlap the Stratton Sagebrush Steppe research area; therefore, management actions associated with other SD/MAs would have little or no impacts on the Stratton Sagebrush Steppe research area.

Transportation and access management actions that maintain BLM road #3422, the main access road into the area, would allow researchers access to the site. Proper maintenance of this road would reduce watershed damage from rutting, road surface damage, and increased erosion and sedimentation that would occur without road maintenance.

Vegetation management actions would include vegetation treatments. The study and quantification of impacts to soil and water resources resulting from vegetation treatments is part of ongoing research and, therefore, meets the goals of the Stratton Sagebrush Steppe research area. In 2005 a prescribed fire was

set as a vegetation management action to achieve the allotment goals for the Middlewood Hill livestock grazing allotment and for Stratton area research objectives. Effects of this prescribed fire, which included removal of vegetative ground cover, exposure of soils to wind and water erosion, and increased runoff potential, were documented as part of ongoing research looking at livestock grazing after prescribed fire.

Water quality, watershed, and soils management actions that contribute to meeting Wyoming Standards for Healthy Rangelands and which avoid surface disturbance in sensitive areas (wetlands, 500 feet from perennial waters and springs) would maintain the water quality and soil conditions necessary as baseline conditions favorable to research and study.

4.13.6.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality management, fire and fuels management, forest management, lands and realty management, paleontology management, recreation resource management, socioeconomics, transportation and access management, vegetation management, visual resource management, water quality, watershed, and soils management, and wild horse management would have impacts similar to those described in the Impacts Common to All Alternatives section.

Cultural management actions that include the avoidance of surface disturbing activities within 1/4 mile of historic properties where the setting contributes to the NRHP eligibility would preclude most surface disturbance-related impacts on the sagebrush steppe vegetation community in these areas. Where conflicts with cultural resources arise, research sites or infrastructure would be relocated to new locations that would meet research goals.

Livestock grazing systems within the Stratton Sagebrush Steppe research area would be designed to achieve management goals for livestock grazing and vegetation health and may not meet the research goals for the Stratton Area. Livestock grazing management strategies would be determined by the Allotment Management Plan (AMP) for the Middlewood Hill livestock grazing allotment. This AMP would not necessarily allow flexibility in the design of grazing systems to adequately meet research objectives, thereby making it difficult to quantify and study livestock-related disturbances. If livestock grazing use levels and grazing strategies are not predictable and consistent, it is likely that livestock grazing would not meet research goals for the Stratton area.

Oil and gas leasing with an NSO stipulation for the Stratton area would avoid the direct impacts of surface disturbance from oil and gas development in this area. Impacts include increased erosion and sedimentation, changed surface hydrology resulting from intercepting and concentrating shallow groundwater flows, and vegetation type conversion. Impacts would be unlikely because this area is currently unleased and there are no known oil and gas resources (Map 4-7). However, there is an oil field to the north of the Stratton area and that area would likely continue to be developed. There may also be additional oil and gas resource identified in the future. Oil and gas development in the area surrounding the Stratton research area may complicate or bias wildlife studies where wildlife frequent areas that would be developed. Wildlife that spends a portion of the year in the Stratton area that loses wintering habitat or nesting habitat because of minerals development would potentially bias long-term research projects. All of the headwaters for the Stratton area are located within the Stratton area; therefore, mineral exploration and development activities are not likely to bias research on water or vegetation.

Offroad vehicular travel for “necessary tasks” would be allowed. Most locations that would need to be accessed for “necessary tasks”—which include fences, water projects, and rain gauges—can be accessed from existing two-track roads. Because the frequency of offroad travel is expected to be low and most places are readily accessed via existing roads, impacts associated with OHV use would be minimal.

No other SD/MAs overlap the Stratton Sagebrush Steppe research area; therefore, management actions associated with other SD/MAs would have little or no impacts on the Stratton Sagebrush Steppe research area.

Management of the Stratton area to support research demands would provide an arena in which to initiate and conduct proactive management of issues affecting management of BLM lands across the RMPPA. The Stratton area would be responsive to existing and future research needs; however, some other multiple use management actions, such as livestock grazing, may complicate research proposals or study. The exclusion of most surface disturbing activities would greatly reduce actions that may compromise research or study.

Wildlife and fish management actions that include the intensive management of surface disturbing and disruptive activities in sensitive wildlife habitats, both inside and outside the Stratton area, would afford protection to wildlife that are an important component of existing research efforts. Intensive management for sensitive species, mountain plover, sage-grouse, neo-tropical and other migratory birds, upland game bird species, amphibian species, reptile species, and habitats would protect a diversity of species during critical time periods throughout the year by limiting human presence and associated surface disturbing and disruptive activities. These management actions would support the diversity of wildlife species present in the area that contribute to a thriving ecologically rich environment that would be important as baseline conditions for any research effort.

Summary

The research potential of the Stratton area would, for the most part, be realized under this Alternative. Some potential of the area could be compromised if livestock grazing actions were incompatible with the research objectives for the area. The majority of surface disturbing activities are precluded within the Stratton area. Some indirect impacts from minerals development activities in other areas may occur if wildlife migrating into or out of the Stratton area change patterns of use because of exploration and development activities.

4.13.6.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality management, fire and fuels management, forest management, paleontology management, recreation resource management, transportation and access management, vegetation management, visual resource management, water quality, watershed, and soils management, and wild horse management would not be likely to impact management of the Stratton Sagebrush Steppe research area or would have the same impacts as those given in the Impacts Common to All Alternatives section.

Impacts on the Stratton Sagebrush Steppe research area from cultural management, lands and realty management, livestock grazing management, OHV management, other SD/MAs, and wildlife and fisheries management would be the same as those identified under Alternative 1.

Impacts on the Stratton Sagebrush Steppe research area from minerals management would be similar to those identified under Alternative 1, except that an NSO stipulation would not be required for new oil and gas leases. Surface disturbance associated with oil and gas exploration and development is unlikely given that this area has been identified as having no oil and gas potential.

Summary

For the most part, the research potential of the Stratton area would be realized. Some potential of the area would be compromised if livestock grazing actions were incompatible with the research objectives for the

area. The majority of surface disturbing activities are precluded with the Stratton area. Some indirect impacts from minerals development activities in other areas may occur if wildlife migrating into or out of the Stratton area change patterns of use because of exploration and development activities.

4.13.6.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, fire and fuels management, forest management, lands and realty management, paleontology management, recreation resource, other SD/MAs, transportation and access management, vegetation management, visual resource management, water quality, watershed, and soils management, and wild horse management would have impacts similar to those described in Alternative 1.

Cultural resource management would prohibit surface disturbing activities within 1/4 mile of historic properties where the setting contributes to the NRHP eligibility and therefore would eliminate all surface disturbance-related impacts on the sagebrush steppe vegetation community in these areas. Where conflicts with cultural resources arise, research sites or infrastructure would be relocated to new locations that would meet research goals.

Impacts from livestock grazing management would be similar to those identified under Alternative 1, except that grazing strategies would not necessarily be determined on the basis of the AMP for the Middlewood Hill Allotment, and only activities that support research objectives of the area would be allowed. This would reduce related undesirable livestock grazing use levels and enhance the research potential of the area.

Impacts from minerals management would be similar to those identified under Alternative 1. However, no new federal leases would be offered for this area. There is State of Wyoming mineral estate adjacent and within Stratton's boundaries; however, because there is no known minerals potential, these state lands are unlikely to be developed for oil and gas resources.

Impacts from OHV use management would be similar to those identified under Alternative 1, except that offroad vehicular travel for "necessary tasks" would not be allowed. This would preclude the potential for crushing or damaging vegetative cover, increasing soil compaction, or increasing erosion or sedimentation that would diminish research opportunities.

Impacts from wildlife and fisheries management would be similar to those identified under Alternative 1, except that more restrictive management actions to protect wildlife habitat (e.g., increased buffer zones around lek habitat, greater seasonal restrictions, and increased controls and prohibitions on surface disturbing activities in wildlife habitat) would help maintain current levels of wildlife that may frequent the Stratton area. Maintaining stable populations of wildlife in and surrounding the Stratton area is important to ongoing research because wildlife is an integral component of the baseline conditions important to any research proposal or project.

Summary

Only minor impacts are expected to occur under this alternative. The research facilities and qualities of the area would be protected by selected management actions. Livestock grazing would be managed to meet the objectives of the research area and no new leasing would be offered for oil and gas activities.

4.13.6.5 Impacts Under Alternative 4: Proposed Plan

Impacts on the Stratton Sagebrush Steppe research area from air quality management, fire and fuels management, forest management, lands and realty management, OHV use management, paleontology

management, recreation resources management, other SD/MAs, transportation and access management, vegetation management, visual resource management, water quality, watershed, and soils management, and wild horse management would be the same as those identified under Alternative 1 or in the Impacts Common to All Alternatives section.

Impacts on the Stratton Sagebrush Steppe research area from livestock grazing management would be similar to those identified under Alternative 1, except that grazing strategies would be determined on the basis of the AMP goals for the Middlewood Hill Allotment and the research objectives for the area. This would benefit the research area by supporting existing or future long-term vegetation studies through quantifiable grazing disturbance.

Impacts on the Stratton Sagebrush Steppe research area from cultural resource management and minerals management would be the same as those identified under Alternative 3.

Impacts on the Stratton Sagebrush Steppe research area from wildlife and fisheries management would be similar to those identified under Alternative 1, except that more restrictive management actions to protect wildlife habitat (e.g., increased buffer zones around lek habitat, greater seasonal restrictions, and increased controls and prohibitions on surface disturbing activities in wildlife habitat) would reduce surface disturbing and disruptive activities to wildlife that move between the Stratton area and adjacent habitats. Maintaining stable wildlife populations in and surrounding the Stratton area is important to ongoing research because wildlife is an integral component of the baseline conditions important to any research proposal or project.

Summary

The research qualities of the area would likely be protected by selected management actions in Alternative 4. Livestock grazing would be managed to meet the objectives of the research area, and no new leasing would be offered for oil and gas activities.

4.13.7 Chain Lakes Potential ACEC/WHMA

4.13.7.1 Impacts Common to All Alternatives

Management actions associated with air quality management, cultural resources management, forest management, paleontology management, recreation resources management, socioeconomics, other SD/MAs, and visual resource management would have little or no impacts.

Fire and fuels management would be managed for AMR in association with the private and state lands, which would most often result in suppression and would reduce impacts from wildland fire, in both the short and long term. Short-term effects would include reduced areas burned and associated erosion, forage loss, and habitat degradation. Long-term effects would include fuels buildup, increasing the possibility of wildland fires, and increasing the amount of older sagebrush stands. In some areas, limited suppression would be implemented to enhance vegetation diversity, reduce older sagebrush stands, improve shrub communities' age class structure, maintain livestock forage, improve livestock management options, and benefit wildlife species.

The Chain Lakes WHMA has fair potential for wind energy development. The WHMA is an avoidance area to wind energy development, utility and transportation systems, and communication sites to protect the important resource values (unique alkaline wetland system, pronghorn and other wildlife) of the WHMA. Increased traffic associated with these developments would increase the potential for conflicts between wildlife species and vehicles. Development of wind energy would result in displacement of

wildlife. Surface disturbance would potentially lead to degradation of the alkaline wetland system. BMPs would be implemented to reduce erosion and sedimentation which would reduce degradation of the alkaline wetland system (Appendix 13).

Livestock management and range improvements would be designed to promote vegetation conditions in conformance with Standards for Healthy Rangelands (USDI, BLM 1997) and would ensure maintenance of the alkaline desert lake wetlands and upland sagebrush communities. The MOU between the BLM and the WGFD provides for the use of livestock grazing as a management tool, maintenance of an optimum population of antelope, maintenance of public ownership, administration of the area in a practical and economical way, and for discouraging new fences.

Currently all of the federal minerals have been leased for oil and gas development within the Chain Lakes area. The southwestern portion of the WHMA has moderate potential for oil and gas development. The rest of the WHMA has a low potential for oil and gas development. Mineral development activity that modifies the unique alkali wetlands would potentially alter water quality and quantity sufficiently to reduce the ability of system to support the unique plant community. Mineral development activities that include water use would potentially withdraw water from aquifers or surface waters. Mud pots have been identified in the area which indicates that deeper water sources play some part in the hydrology of the wetlands. CBNG development would potentially reduce groundwater recharge to the wetlands. There is low to moderate potential for locatable minerals. A notice is required for any disturbance of 5 acres or less, a plan of operations is required for any disturbance of 5 acres or more. If the area is managed as an ACEC, a plan of operations would be required for any activity greater than casual use. Both a notice and a plan require that a reclamation bond be posted with BLM and the State of Wyoming Department of Environmental Quality. Reclamation of any disturbance is required. Mineral material permits are discretionary and, therefore, any request would be evaluated individually. If the potential action is deemed incompatible with management objectives for the area, it would be denied.

Impacts from OHV management actions to the Chain Lakes area would limit vehicle use to existing roads and vehicle routes until the designation process is completed and roads are identified as opened, limited, or closed. Travel limited to existing routes would reduce the potential disturbance of wetlands in the area. However, where wetlands have developed along existing routes, disturbance of vegetation or loss of the hydrologic function of wetlands would potentially occur. Temporary or permanent OHV route closures would occur following analysis. Closure of OHV routes would reduce stress to wildlife and habitat fragmentation. This would mitigate or reduce disturbance to the alkaline desert lake system and wildlife habitat.

Transportation and access management for maintenance of BLM roads such as the Chain Lakes, Continental Divide, Riner Cutoff, Sooner, and Stratton would result in potential construction disturbance and would potentially lead to damage to the wetland area from road use during wet seasons. However, road maintenance would reduce impacts in the long run from these roads.

Vegetation management actions would maintain, restore, and enhance riparian, wetland, and upland vegetation which would meet Wyoming Standards for Healthy Rangelands. Therefore, these actions would provide for a healthy ecosystem to support a diversity of plant and animal species. Vegetation treatments that control noxious or invasive species would reduce or where possible, eliminate small new infestations and control large infestations. Noxious and invasive weed occurrences and possible weed infestations would be reduced, unique wetland habitat would be protected, and wildlife habitat and livestock forage would be preserved.

Water quality, watershed, and soil management actions that include avoidance of surface disturbing activities within 500 feet of wetlands and the application of BMPs (Appendix 13) would be likely to reduce damage to wetland plants and to the hydrologic conditions necessary to maintain the wetlands.

This area is outside all designated wild horse HMAs, and there is no agreement with the Wyoming Game and Fish Commission to allow wild horses on private land. Wild horse gathers would occur in the area if wild horses move in from herd management areas. Wild horse use would alter vegetation cover necessary for visual security of bird species which use the alkaline lakes area for nesting and brood-rearing.

Wildlife and fisheries habitat management actions that contribute to meeting Standards for Healthy Rangelands would maintain or improve wildlife habitat within the Chain Lakes WHMA.

4.13.7.2 Impacts Under Alternative 1: Continuation of Existing Management

This area would be managed as a WHMA. Impacts from air quality management, cultural resource management, forest management, paleontology management, recreation resources management, socioeconomics, other SD/MAs, and VRM would have little to no impacts.

Fire and fuels management, lands and realty management, vegetation management, wild horse management, and wildlife and fisheries habitat management would have the same impacts as described under Common to All Alternatives.

Impacts from livestock management actions would be similar to those described under Common to All Alternatives, except new fence construction would mitigate affects to antelope through location and design of projects and existing fences were to be modified to meet existing BLM standards as reconstruction is needed.

Minerals management actions would include the development of current leases with intensive management of surface disturbing activities in and around the wetland complex, which would disturb upland sites by road and pad construction adjacent to the wetlands. Gas development is occurring within the area (west and south ends) and is expected to expand. Surface disturbing activities would use BMPs (Appendices 1, 13, and 15) to reduce some of these impacts. Disturbance from oil and gas development from existing leases would increase the potential for introduction of invasive weeds, compromise the visual integrity of the area, increase human traffic, increase dust and noise, and possibly disturb individuals engaged in recreation. Wildlife species would be displaced and habitat would be lost, degraded, or fragmented. Continuous noise from gas development activities would reduce the reproductive success of female greater sage-grouse and interfere with their ability to locate leks (Holloran, 2005). Wildlife species would be displaced to the north and east unless or until gas development expands to these areas. Mitigation measures would further minimize impacts on wildlife species by creating buffer zones around critical habitat and restricting surface disturbing activities during critical times. Additional roads would increase the opportunities for the public to access the area; decrease livestock forage, wildlife habitat, and areas of contiguous wildlife habitat; and increase habitat fragmentation.

Mineral development activities that include water use for drilling and construction activities would potentially withdraw water from aquifers or surface waters in the Chain Lakes area. CBNG development would potentially reduce groundwater recharge to the wetlands. Mud pots have been identified in the area which would indicate that deeper water sources play some part in the hydrology of the wetlands and that therefore CBNG would potentially impact these wetlands (Appendix 11).

Locatable mineral potential is low with the exception of uranium. There are currently 3 approved plans of operation and one approved notice to explore for and delineate uranium ore bodies, none of which are in this area. Uranium exploration using in situ techniques would potentially impact the quality of groundwater resources important for wetlands in the area.

Potential for mineral material disposal is low because of the lack of suitable deposits. Mineral material disposals are discretionary and permits would be denied if conflicts were identified.

Occasionally, OHV use would occur for “necessary tasks” potentially causing temporary displacement and increased stress to wildlife. This OHV use would disturb avian species in nesting and brood-rearing habitat; cause possible loss of smaller, less mobile wildlife; crush vegetation; produce ruts in soils; increase erosion; and increase the potential for development of new vehicle routes where offroad travel is repeated.

OHV actions to allow offroad motorized use within the Chain Lakes WHMA to access camping sites or retrieve big game kills would crush plants and increase the number of primitive routes within the WHMA. OHV use would have the potential to introduce weeds into the WHMA, which would create competition between invasive weeds and native vegetation which would modify the habitat and reduce the available forage for wildlife.

Transportation and access management would not consider the acquisition of adjacent lands or easements to improve public access within the Chain Lakes WHMA. Currently, the WGFD owns every other section within the unit, and public access would be maintained. In the event that WGFD considers the disposal of any of its lands within or adjacent to the WHMA, acquisition would ensure the ability to continue appropriate management to improve or maintain the protection of the unique, rare alkaline desert lake system and habitat for pronghorn and other wildlife.

Water, watershed, and soils management would allow reinjection of produced water from federal leases, treatment and/or surface discharge into ephemeral channels, and/or discharge into evaporation-percolation reservoirs. Reinjection of produced waters is unlikely to impact the Chain Lakes ecosystem. Surface discharge with an approved Wyoming Pollutant Discharge Elimination System (WYPDES) permit into ephemeral channels contributing to the Chain Lakes system from CBNG development would potentially add to the flow of the Chain Lakes wetland complex. This activity would potentially contribute to salt and sediment loading and would change the chemistry of the wetlands. Impacts on the wetlands from produced water, in the contributing watershed, would be significant depending on the volume of water discharged. Discharge into evaporation-percolation reservoirs would potentially contribute ground water to the wetlands and would potentially result in surface disturbance near the wetland complexes.

Summary

The area would be managed for multiple use activities, while maintaining natural resources. Mineral development activities, including surface discharge of produced water and associated infrastructure, would potentially alter the relevant and important values, including wildlife habitat and the unique alkaline wetland system of the WHMA.

4.13.7.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Actions associated with air quality management, cultural resources management, forest management, paleontology management, recreation resources management, socioeconomics, other SD/MAs, and visual resource management would have little or no impacts.

Fire and fuels management, land and realty management, vegetation management, and wild horse management would have the same impacts as described under Common to All Alternatives.

The area would continue to be managed as a WHMA. Impacts from livestock management, minerals management, OHV management, transportation and access management, and water quality, watershed, and soils management would be the same as described in Alternative 1.

Wildlife habitat management practices for surface disturbing activities would be similar to those identified in Alternative 1; however, there are no seasonal or temporal timing stipulations for species that are essential for protecting a diversity of species during critical periods throughout the year. Protective measures including NSOs for raptor nests and greater sage-grouse leks; and BMPs for neo-tropical and other migratory birds, upland game bird species, amphibian species, reptile species, sensitive species and their habitats, crucial winter range and parturition timing stipulations for big game species and winter timing stipulations for greater sage-grouse would not be implemented, and surface disturbing and disruptive activities would be allowed in these habitat types. These protection measures are greatly decreased compared to those identified in Alternative 1; therefore, the potential for impacts on wildlife, specifically raptors and big game species, during certain times of the year would increase and disrupt wildlife during critical time periods. Human presence would result in movements of wildlife to lesser quality habitats or alterations from traditional migration and dispersal routes.

Summary

The area would be managed for multiple use activities, while maintaining natural resources. Mineral development activities, including surface discharge of produced water, and associated infrastructure, would potentially alter the relevant and important values, including wildlife habitat and the unique alkaline wetland system of the WHMA. There would be more impacts under this alternative as compared with Alternative 1.

4.13.7.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Management actions associated with air quality management, cultural resources management, forest management, land and realty management, paleontology management, recreation resources management, socioeconomics, other SD/MAs, and visual resource management would have little or no impacts.

Fire and fuels management, wild horse management, and wildlife and fisheries management would have the same impacts as described under Common to All Alternatives.

The Chain Lakes area would be designated an ACEC. Impacts, transportation, and access management would be the same as described under Alternative 1.

The Chain Lakes ACEC has fair potential for wind energy development. The ACEC is an exclusion area for wind energy development, utility and transportation systems, and communication sites to protect the important resource values (unique alkaline wetland system, pronghorn and other wildlife) of the ACEC. Closure of the ACEC would reduce potential conflicts between wildlife species and vehicles, reduce disturbance and displacement of wildlife, and reduce erosion and sedimentation within the alkaline wetland system. Lands and realty management actions would not allow for disposal of public lands. Authorization of new ROWs would be limited to situations where valid existing rights would be upheld. This would reduce the acreage of surface disturbing activities and thereby protect pronghorn and other wildlife habitat and the unique, rare alkaline desert lake system.

Impacts from livestock management actions would be similar to those described under Alternative 1, except new fence construction would be prohibited in big game migration corridors eliminating new barriers to animal movements. All new and existing fences would be modified to meet existing BLM standards, which would reduce stress, energy loss, injury, and mortality to antelope and other big game species.

The ACEC would be closed to new oil and gas leasing, to locatable mineral entry, and mineral material disposals. These action would reduce disturbance and associated impacts to pronghorn and other wildlife habitat within ACEC and adjacent to the wetland system. Existing leases would continue to be intensively managed through the use of BMPs (Appendix 15), which would have the same impacts as those described under Alternative 1. Offroad motor vehicle use for "necessary tasks" would not be allowed. This would eliminate impacts associated with these activities, including habitat degradation, loss of vegetation and forage, damage to sensitive riparian and wetland areas and disturbance to wildlife species.

Offroad motor vehicle use for big game retrieval and to access campsites would not be allowed. This would eliminate impacts associated with these activities, including habitat fragmentation, loss of vegetation and forage, damage to sensitive riparian and wetland areas, and disturbance to wildlife species.

Management of Chain Lakes ACEC would include intensive management. For this area, intensive management would mean that any BLM approved activities that would be detrimental to the management goals and objectives for Chain Lakes would not be allowed. Changes in water levels, water quality, or other values of the Chain Lakes would not be approved for activities that are part of minerals development. In addition, the closure of the ACEC to the operation of public land laws, including sale, would occur. Therefore, these actions would result in reduced impacts to the unique, rare alkaline desert lake system and habitat for pronghorn and other wildlife.

Vegetation treatment actions would contribute to the maintenance, restoration, and enhancement of riparian, wetland, and upland vegetation which would meet Wyoming Standards for Healthy Rangelands. However, in this alternative DPC is required and these actions would provide for a healthy ecosystem that supports a diversity of plant and animal species while meeting the needs of the desert alkaline wetland system. Vegetation treatments that control noxious or invasive species and reduce competition with native vegetation would maintain or improve upland and riparian habitat health, vigor, and diversity.

Water quality, watershed, and soils management actions require that surface discharges of produced water meet ACEC land use objectives. Because the objectives of this area would be to protect the wetlands and wildlife present, it is unlikely that surface discharges of federal waters would be allowed in the contributing watershed to these wetlands. Therefore, reinjection would be the preferred method for produced water disposal and there would be negligible impacts to this unique desert alkaline wetland community from surface discharge of produced water.

Summary

The Chain Lakes area would be designated an ACEC. The ACEC management would limit lands and realty actions; new mineral activity, except on existing leases; surface discharge of produced water; and OHV use for "necessary tasks," big game retrieval, and campsite access, which would reduce new surface disturbance and maintain wildlife habitat values, and unique alkaline desert wetland function. Intensive management of existing oil and gas leases would provide protections to the vegetation communities.

4.13.7.5 Impacts Under Alternative 4: Proposed Plan

Management actions associated with air quality management, cultural resources management, forest management, paleontology management, recreation resources management, socioeconomics, other SD/MAs, and visual resource management would have little or no impacts.

The fire and fuels management, land and realty management, wild horse management, and wildlife and fisheries management would be the same as described under Common to All Alternatives.

The area would continue to be managed as a WHMA. Impacts from mineral management, transportation and access management, and water quality, watershed, and soils management would be the same as described under Alternative 1.

Vegetation management actions would be the same as Alternative 3.

Impacts from livestock management actions would be similar to those described under Alternative 1, except new fence construction would mitigate affects to antelope through location and design of projects. In addition, existing fences would be modified to meet existing BLM standards while meeting the needs of both wildlife and livestock, which would improve wildlife passage and reduce stress to migrating animals and still meet the needs of livestock management and control.

The impacts to the Chain Lakes WHMA from OHV management would be similar to those described in Alternative 1. OHV management would allow motor vehicle use 300 feet off existing roads and vehicle routes to retrieve big game and to access campsites, which would minimize dispersed habitat fragmentation, but would potentially concentrate surface disturbance from OHV use to localized areas near existing roads and vehicle routes.

Utility/transportation systems, communication sites, and wind energy development would be avoided where possible. Development would be intensively managed through the use of BMPs (Appendix 15). Therefore, the potential for impacts described under Alternative 1 would be reduced.

Summary

Impacts would be similar to those described in Alternative 1; however, management actions from Chain Lakes WHMA would include intensive management of surface disturbing and disruptive activities. This would result in reduced impacts to pronghorn and other wildlife, along with their associated habitats, as well as the unique alkaline wetland system.

4.13.8 Laramie Peak Potential ACEC/WHMA

4.13.8.1 Impacts Common to All Alternatives

Air quality management, cultural resources management, forest management, paleontology management, SD/MAs (except the Laramie Peak WHMA), socioeconomics, transportation and access management, visual resource management, wild horse management, and water quality and soils management would have little or no impact on the Laramie Peak WHMA.

The lands and realty program would have minimal impacts on the area, because development is not anticipated. There would potentially be minimal habitat degradation, fragmentation or loss, or species displacement from facility development and construction.

Livestock grazing would result in direct competition for forage, water, and space, as well as result in disturbance from the maintenance of existing range improvements. Livestock grazing would reduce the overall availability of forage, primarily grass and forbs, for wildlife species, but would in some cases increase forage palatability for big game species. These impacts would be tempered through the conformance with the Standards for Healthy Rangelands (USDI, BLM 1997) which would assure that the forage use by all grazing animals would not result in impairment of wildlife habitat. The development of livestock grazing systems and the development of new range improvements would provide the opportunity for improvement or maintenance of desired range conditions that support a diversity of wildlife and fish.

The prohibition of domestic sheep and goats on grazing allotments within the bighorn sheep WHMA would reduce the potential for the spread of disease to bighorn sheep populations and contribute to maintaining the health of those populations. Management actions would be designed to minimize conflicts with adjacent landowners and enhance the natural resource values of the area to meet management objectives. Any grazing systems or range improvements would consider WHMA objectives. This would provide for the maintenance of habitat for bighorn sheep, elk, and mule deer in the Laramie Peak WHMA. However, the intermixed land ownership reduces BLM's ability to effectively manage for wildlife habitat.

In the immediate vicinity of any new water developments, livestock use would reduce available forage for wildlife and shift livestock use from adjacent locations. Additional dependable water sources would provide the opportunity to defer or rest certain habitats from livestock grazing to allow forage species to improve in vigor and production, increase litter, and complete reproductive cycles.

The area would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities through the application of BMPs (Appendix 15). This would reduce disturbance to crucial winter habitat. However, this area is also in a low oil and gas potential area which would result in minimal impacts to wildlife. There is low to moderate potential for locatable minerals. A notice is required for any disturbance of 5 acres or less, a plan of operations is required for any disturbance of 5 acres or more. If the area is managed as an ACEC, a plan of operations would be required for any activity greater than casual use. Both a notice and a plan require a reclamation bond be posted with BLM and the State of Wyoming Department of Environmental Quality. Reclamation of any disturbance is required.

Recreational activities such as hiking, biking, camping, fishing, hunting, and sightseeing that result in increased human presence would have a moderate localized impact on wildlife species. Human disturbance of wildlife results in increased energy costs to the alerted animal and would result in reduced animal fitness and reproductive potential (Geist 1978). This area is used extensively during the hunting season because of the limited public lands in the surrounding area.

Maintenance or enhancement of wildlife habitat with the WHMA, in coordination with the WGFD, United States Forest Service (USFS), USFWS, and other agencies, would benefit big game species by improving forage quality and quantity, increasing hiding cover, and reducing stress during critical time periods. Impacts to threatened, endangered, proposed, and candidate species have been analyzed in the Biological Assessment (USDI, BLM 2007a).

4.13.8.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality management, cultural resources management, forest management, minerals management, paleontology management, SD/MAs (except the Laramie Peak WHMA), socioeconomics, transportation and access management, visual resource management, wild horse management, and water quality and soils management would have little or no impact on the Laramie Peak WHMA.

Fire and fuels management actions within the Laramie Peak WHMA would consist of suppression of all wildland fires, regardless of ignition source. This would maintain the existing wildlife habitat and increase fuel loading. Much of the woodland vegetation, however, is in late seral stage, decadent, and involves heavy fuel loads already. The area also has a high incidence of lightening strikes and a tendency for large wildland fires. Large areas of habitat conversion to early seral stage would reduce the amount and quality of crucial winter habitat available for big game species, primarily elk and deer. However, these large burned areas would provide excellent habitat for bighorn sheep.

Lands and realty management actions would consider acquisition of nonfederal lands which would potentially improve public access in the intermingled land ownership pattern. Increased land under federal management would facilitate managing for the amount and quality of crucial winter habitat available for big game species. This area has excellent potential for wind energy development. Increased traffic associated with wind energy development would increase the potential for conflicts between big game species and vehicles. Intensive management within the area would reduce these impacts through mitigation measures and BMPs (Appendix 15). Intensive management would help reduce disturbance of wildlife habitat.

OHV management actions that limit use to designated routes would have minimal impacts to wildlife because of the natural terrain and because the mixed land ownership pattern has already limited the number of vehicle routes available.

Vegetation management would improve the health and function of native plant communities through reclamation of surface disturbing activities, the use of natural fire and management prescriptions (e.g., burning, plantings, seedings, and chemical, mechanical, biological, and grazing treatments). This would increase forage and the diversity of wildlife habitat. However, the existing level of vegetation treatments and primary invasive weed treatments would not be sufficient to meet wildlife habitat objectives in the existing Laramie Peak Bighorn Sheep Habitat Management Plan. The lack of noxious and invasive weed treatments and the proliferation of cheatgrass would result in the continued loss of native forage species and the degradation of wildlife habitat. Guidelines and restrictions would be applied to protect occupied Special Status Species habitat which would prevent loss of this habitat.

Mitigation measures implemented by the wildlife management program to all permitted actions would reduce disturbance to wildlife species, including big game, greater sage-grouse, and raptors during critical time periods and within buffers of wildlife habitat. Guidelines and restrictions would be applied to protect Special Status fish species (e.g., hornyhead chub) and their habitat. This would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected.

Summary

The area would be managed as a WHMA and surface disturbing and disruptive activities would be restricted or intensively managed to protect habitat conditions. The proliferation of cheatgrass would result in a reduction in quantity and nutritional value of herbaceous species, which would reduce overall habitat quality. The natural topography and low mineral potential would limit development and minimize overall impacts.

4.13.8.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality management, cultural resources management, forest management, paleontology management, SD/MAs (except the Laramie Peak WHMA), socioeconomics, transportation and access management, visual resource management, wild horse management, and water quality and soils management would have little or no impact on the Laramie Peak WHMA.

Impacts from fire and fuels management, livestock grazing management, and OHV management would be the same as describe under Alternative 1.

The impact from mineral management would be similar to the Alternative 1, except that mitigation measures would be reduced. This would increase disturbance to wildlife species, including big game, greater sage-grouse, and raptors during critical time periods and within buffers of wildlife habitat. Therefore, the potential for impacts to wildlife during certain times of the year would increase.

The impacts from vegetation management actions would be similar to Alternative 1, except that the increase in weed treatments—specifically, invasive weeds such as cheatgrass—would minimize proliferation of weed species into native plant communities and increase the abundance and production of native vegetation important for wildlife habitat and forage. Guidelines and restrictions would be applied to protect occupied Special Status Species habitat, which would prevent loss of this habitat.

Mitigation measures implemented under the wildlife management program for all permitted actions would be reduced. This would increase disturbance to wildlife species, including big game, greater sage-grouse, and raptors during critical time periods and within buffers of wildlife habitat. Decreased mitigation measures and seasonal disturbance restrictions would potentially increase disturbance to big game parturition areas, migration corridors, and transitional ranges. Guidelines and restrictions would be applied to protect Special Status Species (e.g., hornyhead chub) and their habitat. These would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected.

Summary

Increased vegetation and weed treatments would maintain and/or enhance forage and habitat for wildlife and livestock. Reduced restrictions on surface disturbing activities would increase the potential for forage loss, human induced stress to wildlife species, and habitat fragmentation.

4.13.8.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, cultural resources management, fire and fuels management, forest management, paleontology management, SD/MAs (except the Laramie Peak WHMA), socioeconomics, transportation and access management, visual resource management, wild horse management, and water quality and soils management would be the same as describe under Alternative 1.

Impacts from livestock management would be the same as describe in Common to All Alternatives and would be managed in accordance with Standards for Healthy Rangelands (USDI, BLM 1997) and, in addition, achieve DPC. Grazing systems and rangeland improvement projects would emphasize desired range conditions that support a diversity of wildlife and fish. This would provide the maintenance and improvement of habitat for bighorn sheep, elk, and mule deer.

Lands and realty management actions for utility and transportation systems and wind energy development would not occur because the ACEC would be an exclusion area.

The impact from mineral management would similar to Alternative 1. The area would be closed to mineral material disposal and locatable mineral disposal, which would remove the potential for surface disturbing and disruptive activities from these actions. Mitigation measures would be increased. This would decrease disturbance to wildlife species, including big game, greater sage-grouse and raptors during critical time periods and within buffers of wildlife habitat. Therefore, the potential for impacts to wildlife during certain times of the year would decrease.

Offroad motor vehicle use for “necessary tasks” would not be allowed, which would result in no impacts to wildlife or their habitats. Other OHV impacts are the same as those described under Alternative 1.

Impacts from vegetation management would be similar to Alternative 1, except that the increase in weed treatments with an emphasis on achieving and maintaining native plant communities would result in weed control for cheatgrass. This would minimize proliferation into and increase native plant communities thereby increasing available forage and cover for wildlife. Priority would be given to achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). This priority would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected. Vegetation treatments in mature and decadent vegetation communities would result in an improved mosaic of early, mid, and late seral conditions that would achieve objectives for the area. Mature and decadent communities would still provide the thermal cover necessary in harsh winters. Creation of an adequate mosaic of age classes provides the mix of forage and cover appropriate for maintenance and survival of large ungulates. Guidelines and restrictions would be applied to protect occupied Special Status Species habitat which would prevent loss of this habitat.

Mitigation measures implemented under the wildlife management program to all permitted actions would increase timing stipulations. This would restore, improve, and enhance habitat conditions for big game species through increased restrictions on surface disturbing activities. Surface disturbing or disruptive activities within big game crucial winter range would require use of BMPs designed to reduce the amount of human presence and activity during the winter months (Appendix 15). Surface disturbing activities in parturition areas would not be allowed resulting in reduced stress and increased survival rates during birthing and calving periods. Water developments would not be allowed in crucial winter range, which would reduce the potential for disturbance to wildlife. This would also reduce the potential modification of these habitats for elk, mule deer, and bighorn sheep used during critical time periods. All existing fences would be modified to current BLM standards and new fences would not be allowed in migration corridors. These actions would reduce stress and entanglement of, and death to, big game species. Guidelines and restrictions would be applied to protect Special Status Species (e.g., hornyhead chub) and their habitat. This would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected.

Summary

Laramie Peak would be designated as an ACEC. Crucial habitat for bighorn sheep, elk, and mule deer would be afforded the greatest protection because of restrictions on surface disturbing activities. Relevant and important values would be preserved through management actions of other resource programs.

4.13.8.5 Impacts Under Alternative 4: Proposed Plan

Laramie Peak area would be managed as a WHMA. Impacts from air quality management, cultural resources management, fire and fuels management, forest management, lands and realty management, minerals management, paleontology management, SD/MAs (except the Laramie Peak WHMA), socioeconomics, transportation and access management, visual resource management, wild horse management, and water quality and soils management would be similar to Alternative 1.

Impacts from livestock management and OHV management would be the same as describe in Alternative 3.

Vegetation treatments for noxious and invasive species would be conducted, which would improve big game crucial winter range. Vegetation management and treatment actions to achieve DPC would increase native vegetation communities and as such improve forage quality and quantity wildlife habitat.

Guidelines and restrictions would be applied to protect occupied Special Status Species habitat, which would prevent loss of this habitat.

Mitigation measures implemented on all surface disturbing or disruptive activities during critical time periods and within buffers of wildlife habitat would reduce disturbance to wildlife species, including big game, greater sage-grouse, and raptors.

Surface disturbing or disruptive activities within big game crucial winter range would require using BMPs designed to reduce the amount of human presence and activity during the winter months (Appendix 15). Wildlife habitat objectives would be considered for all surface disturbing activities. Priority would be given to achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). Guidelines and restrictions would be applied to protect Special Status Species (e.g., hornyhead chub) and their habitat. These would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected.

Summary

Management of the Laramie Peak WHMA would result in protection of big game crucial winter range and allow multiple use. Vegetation treatments designed to achieve DPC, restrictions on surface disturbing activities, and restrictions on offroad motorized vehicle use would benefit wildlife and livestock species through enhanced forage, reduction in habitat loss, and decreases in human induced stress.

4.13.9 Red Rim-Daley Potential ACEC/WHMA

4.13.9.1 Impacts Common to All Alternatives

The Red Rim-Daley WHMA/ACEC, which consists of 11,100 acres, would be managed to emphasize protection of antelope crucial winter range and raptor nesting habitats. Air quality, cultural resources, forestry, paleontology, recreation, SD/MAs (with the exception of the Red Rim-Daley WHMA/ACEC), transportation and access management, visual resource management, and wild horses would have little or no impact on the Red Rim-Daley WHMA/ACEC.

Suppression of wildland fires within the checkerboard lands of the Red Rim-Daley WHMA/ACEC would result in retention of the present mix of vegetation communities which are in predominantly mature to decadent conditions. Small acreages burned would provide some increased herbaceous production where the shrub overstory has been removed. Wildland fire management, in association with private and state land managers, would provide opportunities for the use of wildland fire for resource benefit and prescribed fires to improve rangeland vegetation condition. When needed, wildland fire rehabilitation and restoration efforts would reduce the time required for burned rangeland to return to a productive state and decrease the likelihood of weed infestations.

Livestock management would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. Livestock grazing is managed cooperatively between the BLM and WGFD to meet wildlife and habitat objectives while still accommodating livestock use. This grazing use results in direct competition with wildlife for forage, water, and space as well as resulting in minor disruption of normal wildlife activities during maintenance of existing range improvements. Livestock grazing would reduce the overall availability of forage, primarily grasses and forbs but would, in some cases, increase forage palatability for big game species, such as elk. Cattle feed primarily on grasses, whereas antelope feed on shrubs; therefore, direct competition would be minimal because of limited dietary overlap between the two species. Removal of herbaceous vegetation by livestock grazing would also reduce visual security for grouse nesting. This area has been evaluated for Standards for Healthy

Rangelands (USDI, BLM 1997) (Appendix 8). Conservative livestock grazing use levels would perpetuate herbaceous vegetation production necessary for maintenance of healthy rangelands.

Intensive management of lands, realty actions, and oil and gas development would prevent loss of significant amounts of antelope winter range or rock outcrops important as raptor nest sites. BMPs (Appendix 15) would be implemented to protect important wildlife habitats, including antelope crucial winter range, specifically, and big game migration routes and feeding requirements, generally, as well as nesting substrates for raptors. Careful consideration would be given to lands and realty and oil and gas facility placement to avoid large areas of undisturbed antelope habitat. Careful considerations also would be given to rock outcrops and adequate undisturbed habitat around potential or existing raptor nest sites. Such acts would retain the value of these areas to wildlife. The majority of the Red Rim-Daley WHMA/ACEC-Daley WHMA is currently leased for oil and gas exploration and development. The southeast portion of this management area is within the Atlantic Rim CBNG area. This entire portion has high, moderate, or low potential for oil and gas development. Appropriate application of reclamation practices (Appendix 36) would speed recovery of plant communities and forage production, both in quality and quantity, that are important for sustained wildlife habitat.

Lack of industry mitigation and BMP commitment on WGFD private and state lands would result in weed infestation on public, private, and state lands. In addition, lack of road standards on private and state lands would contribute to increased erosion and habitat degradation. Where industry follows BLM road standards on nonfederal lands, the impacts would be reduced.

Geophysical exploration would result in minor, short-term increased stress, displacement, and disruption of normal wildlife activities resulting from human presence, noise, equipment, and aircraft present during geophysical activities. Healthy wildlife during the summer months would have little difficulty avoiding geophysical activities and returning to normal foraging activities important to maintenance of body condition and fitness.

The Red Rim-Daley area is closed to non-metalliferous, locatable, mineral entry, but would be open to metalliferous, locatable, mineral entry. It currently has several uranium claims. No exploration or development proposals have been submitted. Mineral materials potential is low, and sales are discretionary. Therefore, if conflicts are identified, the permit would be denied.

The Red Rim-Daley area may have seasonal restrictions or travel limitations applied, as necessary, for the protection of wildlife resources. Temporary, winter closures to vehicle travel would eliminate human use and presence in areas important as winter, or crucial winter, wildlife ranges. OHV seasonal restrictions would also reduce visual and audible disturbances to wildlife that often result in rapid escape or avoidance. Wildlife may flee or move to lower quality habitats and expend energy needed for normal winter maintenance. Human presence and activity-related stresses to wildlife would be anticipated to be more frequent in the Red Rim-Daley area because of its proximity to one of the larger communities in the RMPPA.

SD/MA actions would minimize surface disturbing and disruptive activities within the Red Rim-Daley area. These actions would prevent the loss of or disruption to the function of important antelope crucial winter range or raptor nesting habitat. BMPs (Appendix 14, 15, and 18) and appropriate reclamation of surface disturbance (Appendix 36) applied to individual project proposals case-by-case would result in impacts similar to those resulting from management of oil and gas development above.

Vegetation treatments would be implemented to create more diverse plant communities and improve values for wildlife. Application of all forms of control of noxious and invasive plant species (Appendix 19) would address the widest range of noxious and invasive weed problems. Rapid, vigorous, and site-

specific control of noxious and invasive species would prevent weeds that colonize new surface disturbance from expanding into native range. Adequate control of weed patches maintains the diversity, density, and productivity of native range forage species that are important to both wildlife and livestock.

Water quality, watershed, and soil management actions that include intensive management of surface disturbing activities in unstable areas and steep slopes, and applying BMPs in areas with poor soils, would likely reduce impacts from some surface disturbing activities (Appendix 13).

Wildlife and fisheries habitat management would include intensive management of surface disturbing and disruptive activities in RCA to avoid or reduce physical habitat loss, and disruption of normal raptor activity. Reduced disturbance to nesting habitat or raptors promotes maintenance of or improvement in nesting and fledgling success rates. Distance and timing restrictions on human activity protects rock outcrop nest substrates, and assures adequate opportunity for raptors to propagate successfully. In addition, incorporating wildlife habitat objectives in reclamation activities and maintaining or returning connectivity between large contiguous blocks of undisturbed habitat would maintain the winter habitat quality and quantity necessary to sustain WGFD herd objectives within the WHMA.

4.13.9.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, cultural resources, forestry, paleontology, recreation, SD/MAs other than the Red Rim-Daley WHMA/ACEC, visual resource management, and wild horses would have little or no impacts on the Red Rim-Daley WHMA/ACEC.

Fire and fuels management impacts would be the same as those in the Impacts Common to All Alternatives section.

Wind energy facilities, utility/transportation systems, and communication sites would avoid areas of important resource values where possible to retain the relevant and important values for which the WHMA was designated. Should situations arise where the WHMA would not be avoided, additional BMPs would be applied to minimize disturbance. The topography of the Red Rim-Daley WHMA would, in most cases, preclude the consideration of large linear facilities. Small, linear ROWs required to access oil and gas development facilities would result in surface disturbance and loss of habitat.

Grazing systems and range improvements designed to meet standards for rangeland health would provide the opportunity for maintenance or improvement of desired range conditions that support a diversity of wildlife. Improvement of existing water sources and, potentially, new fencing would provide increased control of livestock grazing use levels on antelope crucial winter range. Fences and water developments that consider antelope requirements would ensure that antelope retain access and travel routes to crucial ranges, and that livestock use levels are controlled to retain adequate vegetation on crucial winter ranges when antelope arrive. The majority of the fencing in the Red Rim-Daley already complies with BLM standards for wildlife passage. The exceptions are the two smaller pastures on the north end of the WHMA, which are being converted. Some minimal loss of individual animals would be anticipated where fences cross drainages or weather creates situations or conditions that put animals at additional risk when crossing fences.

Intensive management of oil and gas development would prevent loss of significant amounts of antelope winter range or rock outcrops important as raptor nest sites. BMPs (Appendix 15) would be implemented to protect important wildlife habitats, including antelope crucial winter range specifically, and big game migration and feeding requirements generally, as well as nesting substrates for raptors. Careful consideration of oil and gas facility siting to avoid large areas of undisturbed antelope habitat, as well as rock outcrops and adequate undisturbed habitat around potential or existing raptor nest sites, would retain

the value of these areas to wildlife. The majority of the Red Rim-Daley WHMA/ACEC-Daley WHMA is currently leased for oil and gas exploration and development. The southeast portion of this management area is within the Atlantic Rim CBNG area and all of it is high, moderate, or low potential for oil and gas development. Appropriate application of reclamation practices (Appendix 36) would speed recovery of plant communities and forage production, quality, and quantity important for sustained wildlife habitat.

Lack of industry mitigation and BMP commitment on WGFD private and state lands would result in weed infestation on public, private, and state lands. In addition, lack of road standards on private and state lands would contribute to increased erosion and habitat degradation. Where industry follows BLM road standards on nonfederal lands, the impacts would be reduced.

Geophysical exploration subject to appropriate BMPs, wildlife-related spatial and temporal restrictions, and adherence to State of Wyoming standards for geophysical operations would result in minor, short-term increased stress, displacement, and disruption of normal wildlife activities resulting from human presence, noise, equipment, and aircraft present during geophysical activities. Healthy wildlife during the summer months would have little difficulty avoiding geophysical activities and returning to normal foraging activities important to maintenance of body condition and fitness.

The Red Rim-Daley area is closed to non-metalliferous, locatable, mineral entry, but would be open to metalliferous, locatable, mineral entry. Currently it has several uranium claims located. There have been no exploration or development proposals submitted. Mineral materials potential is low, and sales are discretionary. Therefore, if conflicts are identified, the permit would be denied.

Surface disturbance would increase the potential for introduction of invasive plant species, which could invade crucial winter range habitat, reducing habitat quality and forage availability. The possible lack of operator commitment on private and state lands to implement stipulations and/or BMPs would result in increased habitat disturbance, wildlife disruption, and weed infestation on public, private, and state lands.

Impacts from OHV-related actions would be similar to those described under Impacts Common to All Alternatives above. In addition, off-road vehicular travel for “necessary tasks” would result in minor vehicle damage to native plants and some displacement or disruption of normal wildlife activity. These impacts would be isolated and primarily occur during the summer months when disturbance to wildlife would have a much lower effect. Retrieval of big game kills would result in similar impacts; however, the impacts would only occur for a short period during the fall hunting season.

Because this unit has been cooperatively managed as a WHMA for more than 15 years, continuation of this designation would continue intensive management opportunities. Management efforts have been directed toward wildlife and improving wildlife habitat while balancing multiple-use goals and objectives for public land.

The acquisition of adjacent lands or easements to improve public access within the Red Rim-Daley WHMA/ACEC would not be considered. Currently the WGFD owns every other section in the unit, and public access is assured through an easement from I-80.

Vegetation treatment includes prescribed burning, plantings, and seedings, and chemical, mechanical, biological and grazing treatments. Such treatment of native rangeland would improve the health and function of native plant communities. Improvement of wildlife habitats is being pursued cooperatively with the WGFD through treatments that may include mechanical or chemical treatment, vegetative plantings, and prescribed burning. These vegetation treatments would have short-term impacts on the WHMA by reducing vegetation cover and increasing localized soil erosion. Any vegetation treatment

would be designed to increase forage and habitat for wildlife species and to maintain rangeland health and the desired plant communities of the area.

Application of all forms of control of noxious and invasive plant species (Appendix 19) would address the widest range of noxious and invasive weed problems. Rapid, vigorous, and site-specific control of noxious and invasive species would prevent weeds that colonize new surface disturbance from expanding into native range. Adequate control of weed patches maintains the diversity, density, and productivity of native range forage species, factors that are important to both wildlife and livestock.

Water Quality, Watershed, and Soils Management actions for the Great Divide Basin, in which all of the Red Rim SD/MA is entirely contained, would allow surface discharge of produced water with approved WYPDES permits. Authorizing surface discharge of produced water during natural gas or oil extraction would change the physical hydrology of receiving waters, impact water quality, and would possibly create additional temporary water sources or evaporation/percolation pits that would require reclamation upon project completion.

Spatial buffers and timing restrictions and other BMPs applied to surface disturbing and disruptive activities for raptors, RCAs, and big game would all contribute to the maintenance of adequate habitat to support relevant and important wildlife values within the Red Rim-Daley WHMA. Various restrictions and BMPs designed to address both general wildlife needs and critical seasonal requirements would influence the timing and location of surface disturbing and disruptive activities. Surface disturbing and disruptive activities allowed in big game migration and transitional ranges could disrupt normal wildlife movement between seasonal ranges. Recreational use controlled by limited access to private land would result in only minor disruption of normal wildlife activity, except during established hunting seasons.

Intensive management for sensitive species, mountain plover, sage-grouse, neo-tropical, and other migratory birds, upland game bird species, amphibian species, reptile species, and habitats would indirectly and directly protect a diversity of species during critical periods throughout the year by limiting human presence or implementing BMPs. (See the Wildlife and Fisheries Section 4.19 for additional impact analysis related to specific wildlife management actions.) These management actions would support the diversity of wildlife species present in the area that contribute to a thriving ecologically rich environment.

Summary

Under this alternative, the area would be managed as a WHMA. Most management actions would not be detrimental to the antelope crucial winter range and the productivity of raptor nesting pairs. Oil and gas exploration and development activities on both public and private checkerboard lands has the most likelihood of resulting in significant impacts if development levels push antelope out of crucial habitats and into lower quality environments. Future effects on big game and raptor populations depend on the level and extent of successful oil and gas exploration and development. Livestock management would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation.

4.13.9.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, cultural resources, forestry, lands and realty, paleontology, recreation, SD/MAs other than the Red Rim-Daley WHMA/ACEC, transportation and access management, visual resource management, and wild horse management would have the same impacts as those described in Alternative 1.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives. Water Quality, Watershed, and Soils Management actions would have similar impacts to those described in Alternative 1.

The acquisition of adjacent lands or easements to improve public access within the Red Rim-Daley WHMA/ACEC would not be considered, and is similar to Alternative 1.

Impacts related to development of wind power facilities or linear transportation facilities could disturb both crucial antelope winter range, elk wintering habitat, and raptor nesting habitat. Proposals to build wind power facilities in the nearby areas have already been received. If approved, they would create collision hazards for raptors using the area for nesting, traveling, or hunting. Construction and maintenance of these facilities would result in long-term stress, disruption, and/or complete avoidance of elk along ridge tops that are important winter range on the southern end of the unit. Although the topography of most of the Red Rim-Daley WHMA/ACEC would preclude, in most cases, the consideration of large linear facilities, smaller ROWs could be proposed. These linear ROWs, which are required to access oil and gas development facilities, would result in surface disturbance and loss of habitat, as described in impacts from oil and gas development in the Impacts Common to All Alternatives section above, and Alternative 2's oil and gas development impacts, described below.

Impacts from livestock grazing would be similar to those under Alternative 1. However, there would be more emphasis on livestock production. This would result in additional water developments and fencing to accommodate larger numbers of livestock. WGFD objectives for wildlife habitat would be affected, and the cooperative relationship would be compromised. In addition, increased livestock use would also reduce herbaceous forage available to small mammals that are important for the raptor's food base. Fencing would create additional barriers to movement of wildlife, thus increasing stress, energy loss, and mortality.

Impacts from oil and gas leasing would be in addition to those described in Alternative 1. Intensive development of conventional oil and gas would mean important habitats necessary for big game populations, especially antelope during the critical winter period, would not be sustained. In addition, there are no timing stipulations to protect crucial winter range for big game, and no restrictions in migration corridors. Further, BMPs would not be implemented for neotropical migratory birds, upland game birds, amphibians, and reptiles. Therefore, wildlife species would suffer increased stress, displacement, and lower reproductive success.

More surface disturbance would increase the potential for introduction of invasive plant species, which could invade crucial winter range habitat, reducing habitat quality and forage availability. The possible lack of operator commitment on private and state lands to implement stipulations and/or BMPs would result in increased habitat disturbance, wildlife disruption, and weed infestation on public, private, and state lands.

Although locatable mineral entry would be allowed, impacts would be similar to that described in Alternative 1.

Impacts from OHV use would be similar to Alternative 1, with the exception of increased vehicular traffic related to increasing oil and gas development. Oil and gas activity related to maintenance would be necessary during critical periods, and would result in wildlife displacement. The area would be open to over-the-snow vehicles, further increasing disturbance to wintering wildlife. On private lands, impacts from OHV use would potentially increase with production activities and cause disturbance to wildlife during sensitive periods. As has happened in this area in the past, more traffic on roads tends to increase the number of roads and the formation of new roads on private lands, as well as on adjacent public lands.

Vegetation treatment would be increased under this alternative to provide more herbaceous forage for livestock. Converting large areas from sagebrush-dominated areas to grassland would negatively impact antelope and reduce their crucial winter range. Weed control would be the same as described in Alternative 1.

The Red Rim WHMA would be maintained. However, it would be compromised as a WHMA because of an increased focus on resource production and lack of stipulations and BMPs. Maximum use by livestock and increased development of oil and gas would complicate cooperative wildlife habitat management of the unit with WGFD.

Wildlife habitat management practices for surface disturbing activities would be similar to those identified in Alternative 1. However, there are not any seasonal or temporal timing stipulations for species that are essential to protect a diversity of species during critical periods throughout the year. Protective measures would not be implemented. These include NSO for raptor nests, greater sage-grouse leks, BMPs for neo-tropical and other migratory birds, upland game bird species, amphibian species, reptile species, sensitive species and their habitats, crucial winter range, parturition timing stipulations for big game species, and winter timing stipulations for greater sage-grouse. Moreover, surface disturbing and disruptive activities would be allowed in these habitats. These protection measures are greatly decreased compared to Alternative 1. Therefore, the potential for impacts on wildlife, specifically raptors and big game species, during certain times of the year would increase. These impacts would disrupt wildlife during critical times. Human presence may result in movements of wildlife to lesser quality habitats or alterations from traditional migration and dispersal routes.

Summary

Under this alternative, the area would be managed as a WHMA. However, the reduction in restrictions would decrease protection of crucial antelope winter habitat, and productivity of raptor nesting pairs. Impacts from surface disturbing activities would include habitat loss, degradation, fragmentation, and displacement of wildlife. The lack of intensive management and use of stipulations and BMPs in the area under this alternative would reduce the ability to protect wildlife and habitat types required for population stability and/or growth.

4.13.9.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, cultural resources, forestry, livestock grazing, paleontology, recreation, SD/MAs other than the Red Rim-Daley WHMA/ACEC, vegetation, visual resource management, and wild horse management would have the same impacts as described in Alternative 1.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives.

Exclusion of wind energy facilities, utility/transportation systems, and communication sites would result in no impacts to antelope crucial winter and raptor nesting habitats. Impacts would potentially occur in the event that a utility/transportation system would be required for existing oil and gas development or access to private land within the ACEC. Additional BMPs would be applied to minimize disturbance within the ACEC.

The area would be closed to new oil and gas leasing. Surface disturbing and disruptive activities on existing leases would be intensively managed to meet the objectives of the WHMA. Intensive management and use of BMPs within the area would minimize impacts to wildlife on public lands, although they would not completely eliminate them.

Public lands would be closed to metalliferous, locatable, mineral entry and operation of the public land laws, including sale. Withdrawals would be pursued. Those areas closed to locatable mineral entry would also be closed to mineral material disposals, thereby resulting in no impacts to wildlife habitat

Off-road vehicular travel for "necessary tasks" would not be allowed. Exceptions would be considered on a case-by-case basis. OHV use would be limited to designated roads and vehicular routes. Disturbance or removal of vegetation would not occur, new roads would not be created, and wildlife would spend less energy avoiding the human presence. These limitations would reduce displacement of wildlife and damage to forage and habitat, and limit disturbance or stress during crucial periods.

The Red Rim-Daley WHMA would not be maintained, and the area would become an ACEC. This designation would continue cooperative management in the area with the WGFD, while providing further protection from conflicting resource production measures.

The acquisition of adjacent lands or easements to improve public access within the ACEC would be considered. However, currently the WGFD owns every other section, and public access is assured through an easement from I-80. In the event that WGFD considers the disposal of any of its lands within or adjacent to the ACEC, acquisition would ensure the ability to continue appropriate management to improve or maintain antelope crucial winter and raptor nesting habitats.

Vegetation treatments would be similar to Alternative 1, with more emphasis on achieving DPC related to wildlife. Antelope crucial winter range would be treated to improve plant vigor and diversify age classes to ensure sustainability of important forage. Diversifying the raptor nesting habitat would improve raptor attendance. Other wildlife such as sage-grouse would also benefit, if treatment resulted in diversification and subsequent increased production of riparian and upland forb communities.

Impacts for water quality, watershed, and soils management would be the same as actions common to all, except that actions for surface discharges of produced water would only be allowed if they meet BLM land use objectives. These include providing livestock or wildlife water sources or providing water to maintain wetland function during droughts. Only surface discharges within the natural variability and durations of surface water flows would likely be approved. Separation Creek flows from south to north through the project area and contains some portions with wetland features. Surface discharges could occur, but off-channel reservoirs or pits would not likely occur on public lands for CBNG water disposal.

Wildlife and fisheries management actions would be similar to Alternative 1; however, this alternative would implement additional measures for wildlife protection. Raptor protection measures with a 1.5-mile buffer would be extended from February 1 to September 15 and would be species-dependent; and the raptor NSO to protect nests would extends to a 1/4-mile buffer protection. RCAs would be closed to oil and gas leasing, and activities on existing leases would be intensively managed. Surface disturbing and disruptive activities would be prohibited within big game parturition areas and sensitive species habitat, managed in migration and transitional ranges. BMPs would be implemented in crucial winter range, and water developments would not be authorized in crucial winter range. Further, greater sage-grouse breeding and nesting habitat protection would be extended from March 1 to July 15, with additional programs and winter habitat protection extending from November 15 to March 14. These management actions decrease and/or remove negative impacts to species during critical periods.

These actions also would protect diverse species during critical periods throughout the year. Further, they would help ensure the protection of wildlife and their associated habitat by limiting human physical presence and associated disturbances. Surface disturbing activities and human presence may result in alterations of wildlife habitat selections, specifically during migration and sensitive periods, such as nesting or brood-rearing, which would negatively impact wildlife by disturbing them. However, surface

disturbing activities would be managed in migration and travel corridors. After projects are implemented, there may continue to be disturbance to habitat use by wildlife because of needed maintenance under the project. These impacts would include alterations from traditional migration and dispersal routes caused by disturbance to habitat and/or disturbance from human activities in the area. They also would include avoidance of crucial or preferred habitats, and limitation on the uses of important habitat areas for species throughout various life stages within a year. Monitoring would be required to assess the impacts these disturbances would have on wildlife. BMPs would be used to reduce and/or remove these impacts.

Summary

Under this alternative, the Red Rim-Daley would be designated as an ACEC. Overall, antelope winter range and raptor nesting habitat would be afforded greater protection. This alternative has more restrictive management of minerals activities and off-road vehicular travel for "necessary tasks." Livestock management would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. In addition, all impacts associated with surface disturbing and disruptive activities would be minimized through intensive management and implementation of BMPs. Therefore, impacts to wildlife and habitat within the Red Rim-Daley WHMA/ACEC from other management actions would not be significant to the crucial antelope winter range, and the productivity of raptor nesting pairs and the relevant and important values of the WHMA would be protected under this alternative.

4.13.9.5 Impacts Under Alternative 4: Proposed Plan

Air quality, cultural resources, forestry, lands and realty, paleontology, recreation, SD/MAs other than the Red Rim-Daley WHMA/ACEC, transportation and access management, visual resource management, and the wild horse programs would have the same impacts as those described in Alternative 1.

Fire and fuels management impacts would be the same as those described under Impacts Common to All Alternatives. Water Quality, Watershed, and Soils Management actions would have similar impacts to those described in Alternative 1. Vegetation management actions would be similar to Alternative 3.

Livestock grazing management and associated impacts, oil and gas leasing, geophysical exploration, and locatable and common variety minerals, and off-road vehicular travel for "necessary tasks" would be the same as Alternative 1.

Wildlife and fisheries management actions would include species-specific buffers and seasonal or temporal timing stipulations for wildlife species similar to Alternative 1. However, additional measures for wildlife protection would be implemented under this alternative. Raptor protection measures would be extended from February 1 to September 15; surface disturbing and disruptive activities would be managed in migration and transitional ranges. BMPs would be implemented in crucial winter range and greater sage-grouse breeding and nesting habitat. Greater sage-grouse breeding and nesting habitat protection would be extended from March 1 to July 15, with additional programs and winter habitat protection extending from November 15 to March 14.

These actions will protect a diversity of species during critical periods throughout the year. They also will help ensure the protection of wildlife and their associated habitat by limiting human physical presence and associated disturbances. Surface disturbing activities and human presence may result in alterations of wildlife habitat selections, specifically during migration and sensitive periods, such as nesting or brood-rearing, which can negatively impact wildlife by disturbing them. However, surface disturbing activities will be managed in migration and travel corridors. It should be noted that stipulations could be used when surface disturbing and disruptive activities occur to reduce impacts during these periods. Still, after projects have been implemented, there could be some disturbance to habitat use, alterations from

traditional migration and dispersal routes, avoidance of crucial or preferred habitats, and limitation on the uses of important habitat areas for species throughout various life stages within the year after project implementation. Monitoring would be required to assess the impacts these disturbances would have on wildlife. BMPs would be used to reduce and/or remove these impacts.

Summary

Under this alternative, the area would be managed as a WHMA. Surface disturbing and disruptive activities would be restricted or intensively managed to protect wildlife habitat conditions. This alternative has more restrictive management of minerals activities that affect wildlife habitat than does continuing existing management. Livestock management would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. Overall, impacts on the Red Rim-Daley WHMA/ACEC from other management actions would not be significant to the crucial antelope winter range and the productivity of raptor nesting pairs. This alternative would protect the relevant and important values of the WHMA.

4.13.10 Pennock Mountain WHMA

4.13.10.1 Impacts Common to All Alternatives

Air quality, cultural resources, forestry, paleontology, SD/MAs (except the Pennock Mountain WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the Pennock Mountain WHMA.

Fire and fuels management actions within the Pennock Mountain WHMA would be the similar to the impacts in the rest of the RMPPA. They would serve to maintain the existing wildlife habitat of the area by reducing fuel loading and controlling wildland fires.

The lands and realty program would have minimal impacts on the Pennock Mountain WHMA, as a result of the lack of projected lands and realty actions anticipated in this area. Actions such as land tenure adjustments, including acquisition, easements, or exchange, are not anticipated to occur to a great extent within this WHMA. This is because the WGFD owns or controls most of the nonfederal surface lands, and would have minimal effects on wildlife.

Livestock management actions would be designed to enhance the natural resource values of the area to meet management objectives. Livestock grazing would result in direct competition for forage, water, and space, as well as disturbance from the maintenance of existing range improvements. Livestock grazing would reduce the overall availability of forage, primarily grass and forbs, for wildlife species, but would in some cases increase forage palatability for big game species. These impacts would be tempered through the conformance with the Standards for Healthy Rangelands (USDI, BLM 1997), which would assure that forage use by all grazing animals would not result in impairment of wildlife habitat.

Impacts from mineral management would be minimal because the potential for development is so low within the WHMA (Map 4-7). The area is open to locatable and common variety mineral actions which would potentially lead to the disturbance or loss of habitat values within the unit.

OHV management would result in minimal impacts to wildlife species and sensitive habitats. Impacts that might occur from OHV use would include wildlife stress and displacement, but these impacts would be temporary in nature. The low number of roads and restricted use of off-road motor vehicles for “necessary tasks” minimize the fragmentation of wildlife habitat and lower the stress and energy loss by wildlife, particularly elk and mule deer using winter ranges.

Recreation management activities such as hiking, biking, camping, fishing, hunting and sightseeing that result in increased human presence would have a moderate localized impact on wildlife and fish species. Human disturbance of wildlife results in increased energy costs to the alerted animal. It can result in reduced animal fitness and reproductive potential (Geist 1978). However, the prohibition on motorized vehicles, including over-the-snow vehicles, between December 1 and April 30 would limit vehicle and noise disturbance during critical winter months.

Pennock Mountain WHMA management is guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation to protect and enhance the values for which this WHMA was established.

Vegetation management would improve the health and function of native plant communities through reclamation of surface disturbing activities, the use of natural fire, and management prescriptions (e.g., burning, plantings, seedings, and chemical, mechanical, biological, and grazing treatments). This would increase the diversity of forage, cover, and structure of wildlife habitat to benefit all wildlife species.

Water Quality, Watershed, and Soils Management actions would avoid surface disturbance near water resources, wetlands, steep slopes, and sensitive soils. These management actions would limit surface disturbance in these areas to projects that cannot avoid them and require mitigation and BMPs (Appendix 13) to address the resource values of the area.

Maintenance or enhancement of wildlife habitat with the WHMA, in coordination with the WGFD, USFS, USFWS, and other agencies, would benefit wildlife species by improving forage quality and quantity, increasing hiding cover, and reducing stress during critical periods. Conservation measures for T&E species, proposed and candidate species, sensitive species, and other wildlife would be implemented to promote sound management to conserve and preserve the species and their associated habitat, comply with Section 9 of the ESA, and promote recovery as identified in the provisions of the ESA and BLM policies relating to sensitive species. Impacts to threatened, endangered, proposed, and candidate species have been analyzed in the Biological Assessment (USDI, BLM 2007a).

4.13.10.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, cultural resources, forestry, paleontology, SD/MAs (except the Pennock Mountain WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the Pennock Mountain WHMA.

Impacts from fire and fuels management, lands and realty, OHV, recreation, Pennock Mountain WHMA, vegetation, and water quality, watershed, and soils management would be the same as described in Impacts Common to All Alternatives.

Livestock management actions would involve the development of grazing systems and range improvements in compliance with the objectives of the WHMA. These actions would provide the opportunity for improvement or maintenance of range conditions that support and sustain a diversity of wildlife and fish, and particularly winter habitat for elk and mule deer. In the immediate vicinity of any new water developments, livestock use would reduce available forage for wildlife and would shift livestock use from adjacent locations. Additional, dependable water sources would provide the opportunity to defer or rest certain habitats from livestock grazing. This would allow forage species to improve in vigor and production, increase litter, and complete reproductive cycles.

Mitigation measures implemented under the wildlife management program to all permitted actions would reduce disturbance to wildlife species, including big game, greater sage-grouse and raptors during critical periods and within specified distances of wildlife habitat.

Summary

Under this alternative, the area would be managed as a WHMA. Surface disturbing and disruptive activities would be restricted and managed to protect wildlife habitat conditions. Livestock management and other actions would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. Land and realty actions would have minimal impacts because they are unlikely to occur. Off-road motor vehicle travel would only be allowed for "necessary tasks" between May 1 and November 30. This would result in minor impacts, such as displacement of wildlife while completing maintenance and during monitoring.

4.13.10.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, cultural resources, forestry, paleontology, SD/MAs (except the Pennock Mountain WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the Pennock Mountain WHMA.

Impacts from fire and fuels management, lands and realty, livestock grazing management, OHV, recreation, Pennock Mountain WHMA, vegetation, and water quality, watershed, and soils management would be the same as described in Alternative 1.

Wildlife management-related mitigation measures implemented under this program for all permitted actions would be reduced under this alterative. This would increase disturbance to wildlife species, including big game, greater sage-grouse, and raptors during critical periods and within buffers of wildlife habitat. Particular resources that potentially would be negatively impacted are big game parturition areas, migration corridors, and transitional ranges as a result of decreased mitigation measure and seasonal disturbance restrictions.

Summary

Under this alternative, Pennock Mountain would not be managed as a WHMA. Surface disturbing and disruptive activities would have reduced restrictions that would increase the potential for forage loss, human-induced stress to wildlife species, and habitat fragmentation. Livestock management and other actions would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. Off-road motor vehicle travel would only be allowed for "necessary tasks" between May 1 and November 30. This would result in minor impacts, such as displacement of wildlife while completing maintenance and during monitoring. Increased vegetation and weed treatments would maintain and/or enhance forage and habitat for wildlife and livestock.

4.13.10.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, cultural resources, forestry, paleontology, SD/MAs (except the Pennock Mountain WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the Pennock Mountain WHMA.

Impacts from fire and fuels, lands and realty, minerals, OHV, recreation, and water quality, watershed, and soils management would be similar to those described under Alternative 1, except for fire and fuels, where opportunities to manage wildland fires for resource benefit would be considered.

Impacts from livestock management would be similar to impacts described under Alternative 1, with the exception that management would achieve DPC in addition to meeting the Standards for Healthy Rangelands (USDI, BLM 1997).

Pennock Mountain WHMA management would have similar impacts to what is described under Alternative 1. The exception is that the WHMA would be an avoidance area for utility/transportation systems and wind energy development. This would limit but not preclude placement of these facilities. They would potentially result in trampling, disturbance, or loss of wildlife habitat, and displace, disturb, or cause stress, energy loss, injury, or mortality to wildlife. Closure to locatable mineral entry and mineral material disposals, as well as pursuing withdrawals from locatable mineral entry, would add further protections against the potential loss or disturbance of wildlife habitat and the displacement and other impacts to big game that use this habitat. Vehicle travel for "necessary tasks" which would result in reduced wildlife stress and displacement would be prohibited. Activities like fence maintenance would require additional time and expense to complete. People who participate in non-motorized activities would continue to use the area, but those who prefer to use vehicles may be displaced to other areas.

Impacts from vegetation management would be similar to Alternative 1, except there would be greater emphasis to obtain mosaic patterns of treatment and an increase in weed treatments with an emphasis on noxious and invasive weeds. This would increase forage production and diversity and minimize proliferation of weeds into native plant communities. Emphasis also would be placed on achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). This priority would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are maintained or enhanced. Vegetation treatments in mature, overmature, and decadent vegetation communities would result in an improved mosaic of early-, mid-, and late-seral conditions that would achieve objectives for the area. Overmature and decadent shrub communities usually lack the understory herbaceous species that make up early- and mid-season forage for many species. Mature and overmature communities may still provide the thermal cover necessary in harsh winters. Creation of an adequate mosaic of age classes provides the mix of forage and cover appropriate for maintenance and survival of large ungulates.

Mitigation measures implemented under the wildlife management program to all permitted actions would be increased under this alterative. Wildlife management actions including increased mitigation measures and timing stipulations would restore, improve, and enhance habitat conditions for big game species through increased restrictions on surface disturbing activities. Surface disturbing or disruptive activities within big game crucial winter range would require the use of BMPs designed to reduce the amount of human presence and activity during the winter months (Appendix 15). Surface disturbing activities in parturition areas would be seasonally restricted and would result in reduced stress and increased survival rates during birthing and calving periods

Summary

Under this alternative, Pennock Mountain would be managed as a WHMA. Crucial habitat for elk and mule deer would be afforded the greatest protection because of restrictions on surface disturbing activities. Livestock management and other actions would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. Closing the area to locatable mineral entry and mineral material disposals, in addition to restrictions on OHV use, would reduce the potential for forage loss and stress to elk and mule deer populations from human presence. Avoiding placement of utility/transportation systems and wind energy facilities would also protect wildlife habitat and populations. Relevant and important values would be conserved through the management actions of other resource programs.

4.13.10.5 Impacts Under Alternative 4: Proposed Plan

Air quality, cultural resources, forestry, paleontology, SD/MAs (except the Pennock Mountain WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the Pennock Mountain WHMA.

Impacts from fire and fuels, and livestock management, would be the same as described under Alternative 3.

Impacts from lands and realty, minerals, OHV, recreation, Pennock Mountain WHMA, and water quality, watershed, and soils management would be similar to those described under Alternative 1. The exception is that the WHMA would continue to be an avoidance area for utility/transportation and wind energy facilities as described under Alternative 3.

Impacts from vegetation management would be similar to impacts described under Alternative 3, except more treatments for noxious and invasive species would be conducted, which would improve big game crucial winter range. Vegetation management and treatment actions to achieve DPC would improve native vegetation communities in terms of forage quality and diversity of species, cover, and age-class structure.

Wildlife management actions would apply mitigation measures to all permitted actions during critical periods and with in buffers of wildlife habitat would reduce disturbance to wildlife species, including big game, greater sage-grouse, and raptors. Surface disturbing or disruptive activities within big game crucial winter range would require the use of BMPs designed to reduce the amount of human presence and activity during the winter months. This would result in reduced stress, energy loss, and in combination with other factors, reduced mortality among mule deer and elk (Appendix 15).

Summary

Under this alternative, Pennock Mountain would be managed as a WHMA. Surface disturbing and disruptive activities would be restricted and managed to protect wildlife habitat conditions. Livestock management and other actions would be guided by the existing MOU between the BLM and WGFD along with additional coordination and consultation. Avoiding placement of utility/transportation systems and wind energy facilities would also protect wildlife habitat and populations. Off-road motor vehicle travel would only be allowed for “necessary tasks” between May 1 and November 30. This would result in minor impacts, such as displacement of wildlife while completing maintenance and monitoring. Vegetation treatments would emphasize achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). This priority would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected and/or enhanced.

4.13.11 Wick-Beumee WHMA

4.13.11.1 Impacts Common to All Alternatives

There would be negligible impacts from any BLM program on the unit. The area would continue to be managed, with WGFD, in accordance with the MOU. Under the MOU between the BLM and the WGFD, the 280-acre parcel of BLM surface associated with the Wick-Beumee WHMA would be managed for wildlife habitat, primarily elk.

The BLM surface within the unit has no public access and would have no effects from OHV or Recreation. The WHMA is closed during the winter to motorized vehicle use, including over-the-snow vehicles, an action which would minimize disturbance to wildlife from OHV use.

Livestock grazing is used on most of the unit as a tool to improve forage quality for wildlife, primarily elk. Livestock grazing would be used on the BLM parcel as well to meet Standards for Rangeland Health. This would increase the quality of habitat for elk and increase the numbers of elk using the area.

The area contains less than 20 percent of federal mineral. None of the federal mineral is currently leased, and it has low potential for development. As a result, this area would experience negligible impacts from mineral development.

4.13.11.2 Impacts Under Alternative 1: Continuation of Existing Management

There would be negligible impacts from any BLM program on the unit. The area would continue to be managed with the WGFD in accordance with the MOU.

4.13.11.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts would be the same as Alternative 1.

4.13.11.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Additional protections added to this WHMA—as a result of closure to locatable mineral entry, pursuit of withdrawals, closure to operation of the public land laws, closure to mineral material disposals, closure to oil and gas leasing with intensive management of existing leases, and avoidance of surface disturbing activities in aspen communities—would eliminate the potential for disturbance from these activities. Because WGFD owns the majority of the land within the WHMA, acquisition of adjacent parcels would not be considered at this time. In the event that WGFD considers the disposal of any of its lands within the WHMA, acquisitions would ensure the ability to continue appropriate management to improve or maintain elk crucial winter range. Water developments would not be allowed in crucial winter range, which would further reduce the potential for disturbance to elk crucial winter habitat, maintaining the values of the WHMA.

Summary

Impacts would be similar to those under Alternative 1, except that additional protections would be provided as a result of mitigation measures on this isolated parcel.

4.13.11.5 Impacts Under Alternative 4: Proposed Plan

All impacts would be the same as those described under Alternative 1.

Summary

Impacts would be the same as those described under Alternative 1.

4.13.12 Cave Creek Cave Potential ACEC

4.13.12.1 Impacts Common to All Alternatives

The Cave Creek Cave Potential ACEC would be managed to protect bat habitat within the cave ecosystem. It also would provide public access and recreational opportunities. Management actions related to air quality management, cultural resources management, minerals management, OHV management, paleontology management, SD/MAs, vegetation management, visual resources management, wild horses management, and wildlife and fisheries management would have little or no impact on Cave Creek Cave.

Suppression of wildland fire within the Cave Creek area would protect the existing vegetative communities in the watershed that provide shade and soil stabilization, and that reduce sedimentation and runoff into Cave Creek. Increased sedimentation and exposure of Cave Creek to direct solar radiation would increase stream temperatures. They also would potentially affect suitability of the cave for bat habitation. The potential for a catastrophic wildland fire in the vicinity of the bat cave would be lessened by mechanical fuel reduction treatments (or prescribed fires, where applicable). Areas within the Shirley Mountains have high-standing dead timber fuel loads as a result of insect and disease infestations. Cooperation and coordination with private landowners would provide opportunities for fuel reduction treatments to help reduce the possibility of a catastrophic wildland fire, and thereby maintain watershed conditions and qualities necessary to support the Cave Creek Cave bat habitat.

Harvest of forest products that would potentially affect the water temperature within the cave ecosystem would be carefully designed with adequate setbacks from the water course and associated riparian area to protect the natural resource values of Cave Creek Cave, especially for bat species. Forest management activities on BLM-administered lands would be limited to small, commercial, and noncommercial harvest of minor wood products such as fuelwood, posts and poles, and Christmas trees. Harvest of wood products would only occur within designated areas. This would prevent harvests from occurring in unauthorized areas where timber resources are inadequate to support product removal. Minor harvest activities would not result in adverse impacts to forest health, stream quality, watershed integrity, or wildlife habitat. Small commercial or noncommercial harvests would not contribute to erosion, sedimentation, or removal of shade at levels sufficient to directly or indirectly degrade Cave Creek or the supporting watershed.

Forest management activities conducted in accordance with guidelines, along with implementation of BMPs and reclamation, would allow for both harvesting of forest products and maintenance of the overall health and function of the forest relative to the Cave Creek Cave.

Lands and realty program authorizations on access roads would affect Cave Creek Cave riparian habitat located upstream from the cave. The creek crosses through the intermingled land ownership pattern, which reduces BLM's ability to effectively manage the cave environment. Surface disturbing activities located on adjacent private lands are not subject to the same restrictions and stipulations for preservation of wildlife habitat. Actions on private lands near the riparian areas that are associated with Cave Creek, such as timber harvest, prescribed burns, or road construction, would potentially affect the Cave Creek Cave system and wildlife species, especially bats, that depend on specific environmental conditions of temperature and humidity within the cave system. Acquisitions of nonfederal lands would facilitate improved public access to the cave for recreational or scientific purposes. Acquisitions would benefit the cave system by enabling conservative management and mitigation actions over a larger land area within the Cave Creek Cave system and supporting watershed.

Livestock grazing use levels that are consistent with grazing management strategies that meet Wyoming Standards for Healthy Rangelands would preclude removal of herbaceous vegetation that would increase sediment levels or water temperatures entering Cave Creek. Any grazing use levels that result in abnormal fluctuations in water temperature, water quantity, or other water parameters necessary for maintenance of temperature and humidity within the cave would be avoided. Riparian areas along Cave Creek would receive the greatest pressure from livestock grazing. However, livestock grazing is limited in the vicinity of Cave Creek because most of the area is heavily timbered. Proper livestock grazing use levels would preclude deterioration of watershed function, sustain surface flow regimes, and maintain water temperature within the cave. Water quality and protection of the supporting watershed is important to the long-term sustainability of Cave Creek Cave as suitable bat habitat.

Recreational activity in Cave Creek Cave would lead to encounters with bat species and alterations to the cave environment. Human presence would cause bats to experience unnatural levels of stress during sensitive periods related to breeding or natal care. Bat species are sensitive to changes in their environment including temperature and humidity. The presence of humans would alter environmental conditions in the cave by contributing body heat and respiration. Even small changes in cave environmental factors would negatively affect bat species and lead to abandonment, if environmental conditions were degraded sufficiently. The installation of a bat-accessible gate would reduce human disturbance to bat species within Cave Creek cave during the critical winter hibernaculum periods, spring breeding, and maternity roosting periods.

The Shirley Mountain SRMA action would limit vehicle use to designated roads and vehicle routes. This would reduce disturbance to wildlife species and protect sensitive habitats, plants, and erosive soils on steep terrain. Closure of some redundant or poorly located roads and vehicle routes would reduce the compaction and erosion associated with OHV traffic. Any reduction in damage to vegetation or soils in steep terrain is important to maintain stream quality associated with Cave Creek. Motorized travel restrictions in the form of permanent and seasonal road closures within the SRMA would provide greater conservation of the Cave Creek Cave ecosystem. These actions would reduce the potential for sedimentation or reduced water flow into the cave system, and thereby maintain temperature and humidity in the cave environment. Pursuit of land tenure adjustments to block up federal lands within the SRMA would improve management options and flexibility to address cave issues.

Shirley Mountain SRMA management actions that include consolidation of public lands within the SRMA would favor consolidation in the Cave Creek Cave area. If a land exchange included private lands adjacent to, or upstream from, the cave, it would allow the BLM to manage additional and/or contiguous riparian portions of the Cave Creek watershed. Acquiring lands within the immediate watershed surrounding Cave Creek would enable the BLM to provide increased protection of water quantity and quality and greater control over access to the cave. Impacts that occur on nonfederal lands, particularly those actions that occur upstream, have the greatest potential to influence the Cave Creek ecosystem.

There is currently public access near the Cave Creek Cave via the Shirley Mountain loop road. However, at this time there is no public access to Cave Creek Cave, and visitation to the cave is low. Recreationists and scientific cavers are required to request permission from the private landowner to gain access to the cave. A lack of legal public access to the cave makes it difficult to use the cave for recreational or scientific purposes. Public use easements across private land, or land tenure adjustments, would improve the public's opportunity to experience the cave resource and improve the BLM ability to effectively manage the cave complex. If acquisitions of private lands or easements to facilitate public access are pursued, visitation would increase, and would potentially reduce the quality of the cave for bat habitat. Human presence and activities would contribute to disturbance and harassment of bat species that result in unnecessary energy expenditures by the bats or disruption of natural activities such as roosting or natal care. Further, cave environments are susceptible to changes in temperature and humidity that result from

human body heat and respiration. To minimize human effects, a bat-accessible gate would be installed and locked during sensitive periods such as hibernation, breeding, or maternity roosting.

Water Quality, Watershed, and Soils Management would generally enhance watershed quality, sustain surface flow regimes, and maintain water temperature within the cave. Water quality and protection of the supporting watershed is important to the long-term sustainability of Cave Creek Cave as a suitable bat habitat. Management towards compliance with Wyoming Healthy Rangeland Standards would promote proper function of streams, riparian areas, and wetlands to maintain water quality and water temperature in Cave Creek Cave. Surface disturbing activities ones—that avoid unstable areas, slopes greater than 25 percent, and floodplains within 500 feet of perennial waters, springs, wetlands and riparian zones that support Cave Creek—would further contribute to the maintenance of the Cave Creek system.

4.13.12.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality management, cultural resources management, livestock grazing management, paleontology management, recreation management (with the exception of the Shirley Mountain SRMA), SD/MAs (with the exception of the Cave Creek Cave area), transportation and access management, vegetation management, visual resources management, water quality, watershed, and soils management, and wild horses management would have little or no impacts on Cave Creek Cave.

Fire and fuels management would have impacts similar to or the same as those described under Impacts Common to All Alternatives.

Commercial timber harvest would be conducted in accordance with the Healthy Forest Initiative and Healthy Forest Restoration Act of 2003. The Cave Creek riparian area, included in the 6,700 acres on Shirley Mountain that contain steep slopes and riparian areas, would be open to commercial timber harvest with appropriate mitigation and BMPs (Appendix 19). Small, selective harvests would not affect water temperature as a result of lost shade, solar heating of exposed soils and water, or reduced quantity of water flowing into the cave as a result of woody debris or other blockages to surface flow. The limited timber volume and small public acreage within the watershed upstream of the cave would further limit the impacts from commercial harvest.

Although public lands would be open to operation of the public land laws, including land sales, it is unlikely that public lands in the watershed above Cave Creek Cave would meet exchange requirements under the RFO land exchange criteria (Appendix 6). The mixed public-private land ownership pattern on Shirley Mountain currently reduces the BLM's ability to ensure maintenance of the cave ecosystem. Any loss of additional public land within the cave ecosystem would only exacerbate management opportunities. Avoidance of linear transportation facilities and wind power projects on Shirley Mountain and the Cave Creek cave area would preclude associated surface disturbance and the addition of structures or facilities that create obstacles to flying bats. In situations where these areas would not be avoided, additional BMPs would minimize disturbance to these values, and in only the rarest of situations lands and realty actions would be precluded.

The Cave Creek watershed would be open to locatable mineral entry; however, the reasonably foreseeable development of locatable minerals in the RFO is low. The existing values within the vicinity of Cave Creek cave would preclude mineral material disposals. In addition, the Cave Creek Cave area would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. At this time, no oil and gas development is occurring in the area, and none is anticipated in the future because of the low oil and gas potential (Map 4-7). Should mineral development of any kind occur, the BLM would require the use of BMPs (Appendix 15) and appropriate reclamation (Appendix 36) to reduce or eliminate impacts to the cave ecosystem. Impacts from mineral development would include increased

road development, stream crossings, and related erosion and sediment load that would enter Cave Creek following surface disturbance.

Off-road vehicle use for "necessary tasks," big game retrieval, and camp site access would be allowed. However, with limited potential for mineral development, little if any damage to vegetation or soils is anticipated. Minor impacts would include crushing of vegetation or creation of two track trails and some related erosion. To date, there have not been any known impacts from OHV use that have affected the Cave Creek cave or associated watershed. Steep and wooded terrain limit OHV use and associated impacts because OHV users tend to adhere to two-tracks and existing roads.

Shirley Mountain SRMA actions would open lands to oil and natural gas leasing, with intensive management of surface disturbing and disruptive activities. These activities would have the potential to disturb bat species within the cave area during sensitive periods.

The Cave Creek Cave area would be managed to provide protection and enjoyment of the cave system while other resource uses would be allowed aboveground. Surface disturbing activities, such as road construction, timber harvest, vegetation treatments, and prescribed fires would cause sedimentation and alterations in the flow of water through the cave system. Even small changes in the system would affect wildlife habitat, especially bat hibernacula and maternity roosts. Human presence during critical periods, such as winter hibernation and parturition periods for female bats species, would lead to increased stress, and alter the temperatures and/or humidity. Mitigation (Appendix 1, Appendix 15, and Appendix 18) and BMPs would be applied to surface disturbing activities to reduce or eliminate impacts to these resources.

Water Quality, Watershed, and Soils Management would implement mitigation in the 6,700 acres of riparian and unstable areas for commercial logging, some of which would be upstream of the Cave Creek cave. Impacts would be similar to those described for impacts in the Common to All Alternatives.

Wildlife and fisheries management would include seasonal closure of the Cave Creek Cave gate from November 1 through March 31 for the protection of the bat species and habitat. However, bats that begin hibernation earlier in the fall, or end hibernation later in the spring, would not be fully protected. Bat species are sensitive to microclimate changes within caves, and so restricting human presence within the cave is an important protective action. Human presence within the cave for recreational or scientific visits would result in increased temperature and humidity from body temperature and respiration. The extent human presence affects the internal environment within a cave is related to the number of persons, duration of visits, and frequency of visits. Additional affects of human visitation within a cave are related to disturbances from noise, light, and movement from human travel and exploration within caves. The extent to which bat species within Cave Creek Cave would not positively tolerate human presence is difficult to ascertain. However, bat species are less tolerant of disturbance during sensitive periods including breeding, hibernating, and natal care. Unregulated disturbances would contribute to stress and energy expenditures associated with avoiding human presence or activities. Installation of a bat gate would provide greater protection for the bat species, particularly during sensitive periods.

Summary

Alternative 1 would not fully protect the Cave Creek Cave ecosystem from surface disturbing activities, including forest management, lands and realty actions, and minerals management. Bats within cave systems are extremely sensitive to even minimal changes in air temperature that result from human presence, and sensitive to changes to water temperature resulting from upstream surface disturbing activities. Forestry surface disturbing activities would potentially alter the riparian system that regulates environmental conditions of the caves. The seasonal closure to human activity would benefit bats that are

either hibernating within and/or using the cave as a maternity roost. Seasonal closure of Cave Creek Cave to human presence would permit most bat species to complete important life cycle activities.

4.13.12.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality management, cultural resources management, livestock grazing management, paleontology management, recreation management, SD/MAs (with the exception of the Cave Creek Cave Potential ACEC), vegetation management, wildlife and fisheries management, and wild horse management would be the same as Alternative 1.

Lands and realty management, OHV, transportation and access management, water quality, watershed, and soils management, and wildlife and fisheries management actions would result in impacts similar to those described under Alternative 1.

Fire and fuels management would have impacts similar to those described under Impacts Common to All Alternatives. However, the limitation on the use of heavy equipment during fire suppression operations would potentially increase the size and intensity of wildland fires. The heavy equipment limitation also would result in the need to increase fuel reduction treatments to reduce the chance of a large, wildland fire in the future. Both the larger wildland fires and the increased fuel treatments would modify the overstory tree canopy that contributes to regulation and moderation of water temperatures entering the cave system, as well as increase the surface flow of water and sediment entering Cave Creek cave. Consideration of the cave resources during planning for any wildland fire-related activity would reduce the impacts to the cave system.

Commercial timber harvest would alter the Cave Creek Cave environment if large, complex timber harvests occurred within 1/4 mile of the cave complex, even with intensive management. The short-term impacts would include noise from machinery, vehicles, temporary road improvements, cutting, and timber hauling in close proximity to the cave. Upstream commercial timber harvests, especially clearcuts, would jeopardize the watershed and water quality flowing into Cave Creek. Excessive or sustained noise levels would contribute to disturbance to bat species, particularly during sensitive periods. Although small-scale timber cuts would improve the overall stand diversity of a forest area, the removal of overstory sawtimber and other low story vegetation would alter how the environment influences site-specific stream conditions. Increased water and soil temperatures caused by direct solar heating following overstory canopy removal would translate into direct changes to the water entering the cave. Upstream timber harvests would potentially create harvest debris or other obstructions in the creek channel.

Closure of the public lands to locatable mineral entry (240 acres) and mineral material disposals would preclude the surface disturbance related to mineral development that in turn would change the environmental conditions within the cave. Intensive management for oil and natural gas development would provide for the protection of the riparian habitat that provides water resources to the cave system, as well as the protection to the cave system itself. This intensive management and mitigation would be implemented to reduce and/or remove impacts to wildlife species that depend on this ecosystem. At this time, no oil and gas development is occurring in the area, and none is anticipated in the near future because of the low oil and gas potential in the area. However, if development occurred, BMPs would be implemented to reduce erosion and soil sedimentation into Cave Creek.

The Cave Creek Cave would not be managed as an ACEC. Impacts from management of the Cave Creek area would be similar to the impacts described under Alternative 1. However, the closures to locatable mineral entry and mineral material disposal, the intensive management of timber harvest, and the limitation on use of heavy equipment during wildland fire suppression activities would all reduce direct surface disturbance within the watershed of Cave Creek upstream from the cave. The intensive

management of commercial timber harvest and limitation on heavy equipment use during fire suppression activities would both contribute to indirect increases in water quantity, quality, and water temperature entering Cave Creek.

The visual resource management objective in this area would be managed as a Class III, which is to partially retain the existing character of the landscape. This would allow surface disturbing activities to be more visible or evident to the casual observer.

Summary

Forest management actions within 1/4 mile of Cave Creek Cave would alter the environment of the riparian ecosystem, even with intensive management. Minor changes to water quantity, water quality, and water temperature entering the Cave Creek cave would occur. Closure to locatable mineral entry (240 acres) and mineral material disposals would protect the cave from mining or mineral disposal-related surface disturbance and noise, and would maintain associated wildlife populations that depend on this ecosystem. The Shirley Mountains would not be managed as an SRMA. However, the implementation of intensive management, stipulations, and BMPs would reduce some impacts to the cave system. The cave system itself would not be altered, which would provide for continued recreational activities for scientists and recreationists. Seasonal closure of Cave Creek Cave to human presence would provide for most bat species to complete important life cycle activities.

4.13.12.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, cultural resources management, livestock grazing management, minerals management, paleontology management, recreation management (with the exception of the Shirley Mountain SRMA), SD/MAs (with the exception of the Cave Creek Cave Potential ACEC), transportation and access management, vegetation management, water quality, watershed, and soils management, wildlife and fisheries management, and wild horses management would be the same as Alternative 1. Although the Shirley Mountain SRMA would be open to oil and natural gas leasing with an NSO stipulation, and existing leases would be intensively managed, the impacts, the impacts of these activities would be the same as those identified under Alternative 1.

Fire and fuels management and visual resource management impacts would be the same as those identified under Alternative 2.

Prohibition of timber harvest within a 1/2 mile of the cave complex would greatly reduce impacts from forest management activities. However, sedimentation and alteration in the flow and temperature of water through the cave system would still occur. Protection of the Cave Creek riparian area, included in the 6,700 acres on Shirley Mountain that contain steep slopes and riparian areas, would maintain tree canopy and understory vegetation necessary for maintenance of the cave environment. Even small changes in the riparian system that flows into the cave would affect wildlife habitat, especially bat hibernaculums and maternity roosts, and cause abandonment of the cave during critical life cycles of these species. Therefore, protecting these water resources would protect the cave and maintain the hydrological system on which it depends. Forest management actions which contribute to overall forest health (Appendix 19) would further assure maintenance of bat habitat within the cave system.

Off-road vehicular travel for “necessary tasks,” big game retrieval, and camp site access would not be allowed in the ACEC. This action would protect the riparian ecosystem that regulates the cave resources, specifically air flow and water temperature. In turn this would protect the numerous wildlife species that depend on the entire cave system, or a portion of the system, for their natural life cycles.

Closure of the Cave Creek Cave ACEC (520 acres) to operation of the public land laws, including sale and closure of the area to locatable mineral entry, mineral material disposal, and oil and gas leasing, would provide for the protection of the riparian habitat that provides water resources to the cave system. It also would benefit the cave and associated wildlife species that depend on this ecosystem. The entire range of management actions within the ACEC would ensure that the cave system itself and the public land upstream of the cave entrance would not be altered. This would provide for the maintenance of the cave environment and the upstream watershed and the continued use of the cave system for scientific and recreational purposes. Impacts from seasonal closure of the cave to human activity would be the same as Alternative 1. Avoidance of linear transportation facilities and wind power projects on Shirley Mountain and the Cave Creek cave area would preclude associated surface disturbance and the addition of structures or facilities that create obstacles to flying bats.

The Cave Creek Cave ACEC would be managed to provide for protection and enjoyment of the cave system. Surface disturbing activities, such as road construction, timber harvest, fuel reduction treatments, and prescribed fires, would be intensively managed to avoid sedimentation and alterations in the flow of water through the cave system. Human presence during critical periods, such as winter hibernation and parturition periods for female bats species, would lead to increased stress, and alter the temperatures or humidity within the cave system. Mitigation measures (Appendix 1, Appendix 15, and Appendix 18) and BMPs would be applied to surface disturbing activities to reduce and/or eliminate impacts to these resources.

Summary

Timber harvest activities, although restricted within 1/2 mile of the cave complex, would still potentially alter temperature and humidity within the cave ecosystem. These impacts would be detrimental to wildlife habitat, especially bat hibernaculums and maternity roosts. Public lands would be closed to land tenure adjustments (including sale). Public lands also would be closed to locatable mineral entry (520 acres) and mineral material disposals. The area would be closed to oil and gas leasing, and off-road vehicular travel for “necessary tasks” would not be allowed. Surface disturbing activities would be restricted within the Cave Creek Cave watershed. Activities would be avoided on unstable areas, slopes greater than 25 percent, floodplains within 500 feet of waters and springs, and wetland riparian areas. Collectively, these actions would reduce or remove most impacts to the Cave Creek Cave and adjacent riparian habitat. Thus the actions would sustain the cave resource and associated wildlife species that depend on this ecosystem.

4.13.12.5 Impacts Under Alternative 4: Proposed Plan

Air quality management, cultural resources management, livestock grazing management, paleontology management, recreation management (with the exception of the Shirley Mountain SRMA), SD/MAs (with the exception of the Cave Creek Cave Potential ACEC), transportation and access management, vegetation management, water quality, watershed, and soils management, and wild horses management would be the same as Alternative 1. Although OHV actions would allow off-road OHV use 300 feet from existing or designated roads and vehicle routes within this alternative, the impacts would be the same as Alternative 1.

Fire and fuels management, minerals management, and visual resource management impacts would be the same as those identified under Alternative 2.

Impacts from Shirley Mountain SRMA management actions would be the same as those identified under Alternative 3.

Closure of the area within 1/4 mile of the cave system to commercial timber harvest would prohibit timber harvests from occurring within close proximity to the cave. However, this would not eliminate changes to the cave system from actions outside close proximity. All surface activities on BLM-administered lands would employ mitigation and BMPs to reduce impacts to Cave Creek and the supporting watershed. Land use activities such as temporary road improvements, stream crossings, and timber hauling would be allowed outside the buffer, and would lead to soil and vegetation disturbances. This would alter the quality, quantity, and temperature of water that flows through the cave system. Even with harvests conducted in association with the Healthy Forest Initiative and Healthy Forest Restoration Act of 2003, these actions would affect the cave system. Small changes in the cave system would affect wildlife habitat, bat hibernaculums, and maternity roosts, and possibly lead to abandonment of the cave during the critical life cycles of bat species.

Closure of the Cave Creek Cave ACEC to land tenure adjustments, including sale, would retain this valuable cave resource and a portion of the upstream watershed under federal management. Avoidance of the ACEC during placement of ROWs required to access adjacent private property reduces the likelihood that surface disturbance would lead to reductions in water quality and quantity. Avoidance of major linear transportation facilities and wind power projects on Shirley Mountain and the Cave Creek Cave ACEC would preclude associated surface disturbance and the addition of structures or facilities that create obstacles to flying bats.

Public lands would be closed to locatable mineral entry (240 acres) and mineral material disposals. The area would be open to oil and gas leasing. However, surface disturbing activities would be intensively managed to meet the objectives of the ACEC.

The Cave Creek Cave would be managed as an ACEC. Impacts from management of the Cave Creek area would be similar to the impacts described under Alternative 3.

A seasonal closure of the Cave Creek Cave gate from October 15 through April 30 for the protection of the bat hibernaculum would protect a greater diversity of bat species, including several sensitive bat species, during a longer time period. The protection of the bat species would take effect approximately 15 days earlier in the fall and 30 days later in the spring. This would provide for optimal protection without unnecessary closure of the cave to human presence and recreational activities. Wildlife habitat improvement projects that would be implemented within the area would potentially disturb wildlife in the short term. However, monitoring would be required to assess the impacts these disturbances would have on wildlife, and BMPs would be used to reduce or remove these impacts.

Summary

The 1/4-mile buffer would prevent surface disturbing activities from occurring in close proximity to the cave system. However, this distance would not completely eliminate all potential alterations to the cave system as a result of land use activities. Public lands would be closed to land tenure adjustments (including sale), and withdrawals would be pursued. Public lands would be closed to locatable mineral entry (240 acres), and mineral material disposals and withdrawals from locatable mineral entry would be pursued. In addition, although the area would be open to oil and gas leasing, surface disturbing activities would be intensively managed to meet the objectives of the ACEC. These actions would greatly reduce or prevent alterations to the Cave Creek Cave ecosystem and adjacent riparian habitat, which would benefit the cave resource and associated wildlife species that depend on this ecosystem. In addition, avoidance of unstable areas, slopes greater than 25 percent, floodplains within 500 feet of waters and springs, and wetland riparian areas during any surface disturbing activity would contribute to the maintenance and health of the Cave Creek Cave Potential ACEC. Lastly, increasing the seasonal gate closure would afford additional protection of the bat species.

4.13.13 Laramie Plains Lakes Potential ACEC/WHMA

4.13.13.1 Impacts Common to All

Air quality, cultural resources, forestry, minerals, OHV, paleontology, SD/MAs (with the exception of the Laramie Plains Lakes Potential ACEC), socioeconomics, transportation and access management, visual resource management, and wild horse management would have little or no impact on the Laramie Plains Lakes area.

Management actions associated with the Laramie Plains Lakes area would be designed to minimize conflicts with adjacent landowners and enhance the natural resource values of the area to meet management objectives. However, the intermixed land ownership reduces BLM's ability to effectively manage wildlife habitat. Surface disturbing activities located on private lands are not subject to the same restrictions and stipulations for preservation of wildlife habitat. These actions would in some cases have impacts that carry over to the adjacent BLM lands and reduce the quality of wildlife habitat and forage.

Fire management activities would have minimal impact on the unique values of the area. Wildland fire would be managed for AMR, which, because of the amount of private lands in the area, would most often result in suppression. Because of the close proximity of the area to Laramie, Wyoming, the large blocks of private land adjacent to public lands within the Laramie Plains Lakes area, and the sensitivity of the riparian/wetland habitat type, fire suppression would be an appropriate response to protect wildlife species or habitats. Any wildland fires in the vicinity of potential Wyoming toad habitat would not only temporarily remove habitat and cover, but also would potentially kill individuals of the species once, or if, they are introduced into the area. Wildland fire suppression would also keep fires to the smallest possible size and reduce the input of ash and sediment into the lake systems and pond environments necessary for the existence and survival of the Wyoming toad.

Livestock grazing use would be managed to meet multiple-use objectives for the area as well as to meet Standards for Healthy Rangeland. Any grazing use adjustments necessary to achieve such standards would consider vegetation utilization levels, physical animal impact, and seasonal precipitation events (duration of saturation) that would enhance the health and diversity of plants and habitats, specifically those important to the Wyoming toad.

Dispersed recreation within the Laramie Plains Lakes Potential ACEC would increase the potential for habitat degradation through human activities within the area. Activities which include, but are not limited to, camping, hiking, boating, and shore fishing, would have the potential to degrade habitat for species, specifically the Wyoming toad.

Management actions related to the Laramie Plains Lakes SRMA would ensure the continued availability of outdoor recreational opportunities. Specific actions within the Laramie Plains Lakes SRMA include the reconstruction of the Lake Hattie campground, the pursuit of land tenure adjustments to improve recreational opportunities, and the development of interpretive recreational opportunities. The Lake Hattie campground would be outside of riparian/wetland habitat, which would avoid impacts to riparian wildlife, specifically, the Wyoming toad potential habitat. However, associated recreation would lead to additional use in the riparian area. This would impact wildlife through direct or indirect physical harm (e.g. trampling), or through introduction of harmful fungi from other wetland/riparian areas.

Public education about wildlife, specifically the Wyoming toad, and the potential habitat within the Laramie Plains Lakes area would ensure protection of wildlife-related values, while providing for recreation opportunity. Although recreation use may increase, reclamation of unnecessary or undesirable

routes would reduce fragmentation of habitats and improve connectivity between various segments of the riparian/wetland complex.

Management actions related to vegetation would emphasize weed management. The use of all forms of control of noxious and invasive weed species would ensure native plant diversity, frequency, and production important to maintaining a proper functioning riparian/wetland complex. Noxious and invasive species compete for nutrients and space, and in some cases create physical soil conditions that inhibit growth of native plants. Amphibians are sensitive to negative impact by pesticides and herbicides. Any control methods would consider the life cycle requirements of amphibians and other riparian/wetland or aquatic species.

Management actions related to water quality, watershed, and soils management would emphasize the protection and improvement of potential Wyoming toad habitat. Avoidance of the riparian/wetland vegetation complex during any surface disturbing activity would assure continued viability of the area as potential Wyoming toad habitat. Amphibian species are extremely sensitive to changes in water quality and chemistry. Thus, BMPs would be incorporated into any surface disturbance adjacent to the riparian/wetland complexes to prevent disruption of the water cycle, water chemistry, and volume. The rehabilitation and reclamation of the Laramie Plains Lakes Potential ACEC area provides an opportunity to improve habitat for wildlife, especially the endangered Wyoming toad.

Wildlife habitat management actions to meet Wyoming Standards for Healthy Rangelands and objectives for reclamation practices would benefit riparian/wetland habitats. Wyoming toad habitat objectives would be considered for all surface disturbing activities. Surface disturbance within the riparian/wetland vegetation complex would result in habitat loss, degradation, and fragmentation as well as direct loss of individual toads or displacement of potential Wyoming toad populations. Surface disturbance would increase the potential for the introduction and proliferation of invasive plant species, and harm riparian vegetation critical for Wyoming toad populations. Reclamation of surface disturbing activities would aid in restoring functioning native plant communities.

4.13.13.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, cultural resources, fire and fuels, forestry, paleontology, recreation (with the exception of the Laramie Plains Lakes SRMA), SD/MAs (with the exception of the Laramie Plains Lakes Potential ACEC), transportation and access management, visual resource management, and wild horse management would have little or no impact on the Laramie Plains Lakes area.

The Laramie Plains Lakes area would not be designated as an ACEC, but would be managed as a WHMA. Actions would be implemented to maintain, restore, or protect potential habitat for a diversity of waterfowl species, as well as the endangered Wyoming toad. Partnerships with adjacent landowners would be pursued to achieve cooperative management, and improve riparian habitat for a diversity of wildlife species, especially the toad. Increased cooperation would identify areas where management would be implemented to maintain, restore, and protect potential Wyoming toad habitat.

Public lands open to operation of the public land laws, including sale, which would potentially introduce new ROWs through portions of the Laramie Plains Lakes area. Sensitive riparian/wetland vegetation complexes and potential Wyoming toad habitat would be avoided by standard buffer distances but activity adjacent to these habitats would introduce sediment or chemicals into the system that would be detrimental to amphibian or aquatic species. Management actions would be designed to minimize conflicts with adjacent landowners and enhance the natural resource values of the area. The intermingled land ownership pattern complicates the BLM’s ability to effectively manage for wildlife habitat in isolation from the private lands. Therefore, management requires a coordinated effort with adjacent

landowners. Surface disturbing activities located on adjacent private lands are not subject to the same restrictions and stipulations for preservation of wildlife habitat. Still, increasing partnerships with adjacent landowners, and increasing or improving the riparian/wetland vegetation complex, would improve habitat for wildlife species, specifically the endangered Wyoming toad.

Potential sale or exchange of public lands that met FLPMA disposal criteria within the Laramie Plains Lakes area (Map 2-10) would eliminate the opportunity to maintain or enhance the riparian/wetland complex to improve potential Wyoming toad habitat. Consideration and evaluation of the relative value of resources on lands considered for exchange (Appendix 6) would reduce or eliminate the likelihood that this would occur. Any exchange that consolidates public lands in the area would potentially improve manageability of connected riparian/wetland habitats. Avoidance of riparian/wetland habitats in planning for linear transportation facilities and wind energy development projects would preclude loss of, or disturbance to, these important habitats.

Livestock management actions, including those described under the Common to All Alternatives, would emphasize the values of riparian/wetland vegetation that provide habitat for a diversity of wildlife species, including the Wyoming toad. Grazing systems would be altered through duration, season, and levels of use to minimize adverse affects to riparian/wetland habitat. Range improvement projects would be constructed to implement these grazing systems, including development of off-site water sources to avoid livestock use in riparian/wetland habitat to improve vegetation vigor, cover, and species composition. This would provide adequate rest periods for growing plants and for deferring use when plants are most vulnerable to grazing, which would improve the water table and overall hydrologic function.

Minerals actions would open public lands to locatable mineral entry and mineral material disposals within and adjacent to the Laramie Plains Lakes area. The RFD for locatable minerals is low (25 acres of disturbance a year), and mineral materials disposal is discretionary. Therefore, these activities would have minimal to no impact to potential Wyoming toad habitat. In addition, the area would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. Upland habitat impacts would include habitat loss, degradation, fragmentation, and displacement of potential wildlife from the construction of linear features and other permitted facilities. These actions may alter the ecosystem that may affect downslope riparian habitat and may negatively affect a diversity of species, especially the endangered Wyoming toad. Although the potential for development within this area is low, intensive management would be required to reduce or eliminate these impacts.

Off-road vehicular use for “necessary tasks” would be allowed throughout the area, which may negatively impact riparian habitat. Impacts would include increased surface disturbance, soil and vegetation compaction, and a potential increase in two-tracks, which would result in the direct loss of some habitat as well as the potential dewatering or fragmentation of riparian/wetland habitats. These actions would result in negative impacts to the hydrologic and biotic functions of the riparian systems in the area.

The acquisition of lands or easements to enhance access to the public lands within the Laramie Plains Lakes area, and/or to expand habitat to meet the objectives of the management area, would have both positive and negative impacts. The acquisition of additional lands for habitat improvement projects would provide protection for a diversity of species and habitat types and increase the opportunity to expand BLM jurisdiction in potential Wyoming toad habitat. Conversely, an increase in public use of the area would lead to more disturbance to the area in general, such as an increase in unauthorized two-tracks and increased trampling of vegetation.

Specific actions within the Laramie Plains Lakes SRMA area include the restriction of OHV use to existing roads or vehicle routes. Allowing OHV use on existing roads and vehicle routes would impact

wildlife through direct or indirect physical harm (e.g., trampling), or introduction of harmful fungi from other wetland/riparian areas.

Vegetation management prescriptions, including burning, plantings, seedings, and use of chemical and/or mechanical treatments, would be designed to enhance the health and diversity of potential Wyoming toad habitat. Priority areas for control of noxious and invasive species would include all SD/MAs. This would allow for the discovery and treatment of small infestations before they increased in size and began to influence native species composition, production, diversity, etc. Any chemical treatments would consider the life history requirements of amphibian and other riparian/wetland or aquatic species and appropriate application of BMPs for herbicide application.

Management actions related to water quality, watershed, and soils management would emphasize the protection and improvement of wildlife habitat. Surface disturbing and disruptive activities would be avoided in identified 100-year floodplains, areas within 500 feet from perennial waters, springs, and wetlands, and areas 100 feet from the inner gorge of ephemeral channels. This would protect a diversity of species and habitats, including the Wyoming toad, during critical periods by maintaining the integrity of these habitats.

Wildlife and fisheries management would include intensive management of surface disturbing and disruptive activities to maintain or enhance habitat for amphibian species. Surface disturbing activities in upland areas adjacent to riparian/wetland habitats would include the use of BMPs (Appendix 14 and 15) designed to reduce or preclude any habitat degradation caused by possible sediment inputs into riparian/wetland systems, fragmentation of habitats from linear disturbances between riparian/wetland communities, or displacement of potential Wyoming toad populations. Habitat and species conservation measures for T&E species (Appendix 14), including the endangered Wyoming toad, would be applied to all surface disturbing and disruptive activities to reduce or eliminate these potential impacts. This would protect a diversity of species and habitats during critical periods.

Summary

Lands and realty actions would open public lands to the operation of public land laws, including sale, or exchanges, which would protect sensitive riparian/wetland habitat and associated species. Application of RFO land exchange criteria would likely preclude transfer of sensitive riparian/wetland habitat out of public control. The acquisition of lands or easements to enhance access to the public lands, and increased partnerships with adjacent land-owners, would expand and improve habitat for wildlife, specifically the endangered Wyoming toad. Mineral actions and off-road vehicular use may alter the riparian habitat and negatively affect a diversity of species, especially the endangered Wyoming toad. Limited mineral potential in the area would minimize these impacts. The Laramie Plains Lakes area would not be designated as an ACEC, but would be managed as a WHMA, which would improve the riparian habitat. Water quality, watershed, and soils and wildlife and fisheries management would emphasize the protection and improvement of wildlife habitat, including habitat for the endangered Wyoming toad.

4.13.13.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, cultural resources, fire and fuels, forestry, lands and realty, livestock grazing, minerals, OHV, Laramie Plains Lakes Potential ACEC (except acquisition), Laramie Plains Lakes SRMA, paleontology, recreation, SD/MAs transportation and access management, visual resource management, vegetation, and water quality, watershed, and soils programs, as well as wild horse management, would be the same as Alternative 1.

The acquisition of lands or easements to expand habitat and/or enhance access to the public lands within the Laramie Plains Lakes area would not be pursued. Presently, Wyoming toads are found only in Mortenson Lake. Any time a species is confined by limited habitat, the possibility exists for the rapid loss of individuals as a result of catastrophic events caused by nature or man, such as wildland fire or chemical spills. Any decline in habitat quality caused by decline in water quality or riparian/wetland habitat quality would lead to a long-term decline in Wyoming toad habitat and population numbers. Without additional potential habitat development or acquisition, the species may become dependent on captive breeding. Conversely, the potential to improve recreational visitation through easement acquisition would not be pursued, thereby reducing disturbance to Wyoming toad habitat.

Wildlife and fisheries management would include habitat and species conservation measures for T&E species, and would be applied to all surface disturbing and disruptive activities to reduce and/or eliminate impacts. Protecting Wyoming toad habitat would protect a diversity of species using this habitat type. However, actions would not include intensive management of surface disturbing and disruptive activities. This would result in potential habitat loss, degradation, and fragmentation of wetland/riparian sites that would support Wyoming toad populations. Because the Wyoming toad is currently restricted to a single location, management for other locations with suitable habitat is crucial for the survival of this species.

Summary

Impacts from the lands and realty (except acquisition), livestock grazing, minerals, OHV, Laramie Plains Lakes Potential ACEC, and Laramie Plains Lakes SRMA programs would be the same as those under Alternative 1. The acquisition of lands or easements to enhance access to the public lands, and increasing partnerships with adjacent land-owners, would not be pursued within the Laramie Plains Lakes Area. This would limit management opportunities for the benefit of riparian habitat species, specifically the Wyoming toad. Wildlife and fisheries management would not include intensive management of surface disturbing and disruptive activities, which would result in habitat loss, degradation, fragmentation, and displacement of potential Wyoming toad populations.

4.13.13.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, cultural resources, fire and fuels management, forestry, livestock, paleontology, recreation (with the exception of the Laramie Plains Lakes SRMA), SD/MAs (with the exception of the Laramie Plains Lakes Potential ACEC), socioeconomics, transportation and access management, vegetation, visual resource management, and wild horse management would be the same as Alternative 1.

Lands closed to operation of public land laws, including sale, would preclude access to the riparian/wetland areas. This action would protect sensitive riparian/wetland habitats and the species that depend on this type of ecosystem, specifically the Wyoming toad. This would lead to additional space for habitat improvement projects and areas protected for a diversity of species and habitat types.

The acquisition of private land or easements across private land to expand habitat and/or enhance access to the public lands within the Laramie Plains Lakes area to meet the objectives of the ACEC would be pursued. This action would have both positive and negative impacts. An increase in public use of the area would lead to more recreational visitation, an increase in two-tracks, and more disturbances to the area. Mitigation would be implemented to avoid disturbance to riparian/wetland habitat. Increasing partnerships with adjacent landowners and improving riparian habitat would provide habitat for a diversity of wildlife species, specifically the Wyoming toad. Intensive management in these new areas would avoid or restrict surface disturbing activities (including seasonal restrictions), make use of buffers that protect sensitive species (such as the Wyoming toad), and implement BMPs which would minimize and/or reduce loss or fragmentation of riparian/wetland habitats in this area.

Minerals actions would close public lands to locatable mineral entry and mineral material disposals within the Laramie Plains Lakes area. In addition, the area would be closed to oil and gas leasing and surface disturbing activities. Existing leases would be intensively managed to meet the objective of the wildlife habitat area. Although the potential for development within this area is low, intensive management would decrease and/or eliminate habitat loss, degradation and fragmentation of potential habitat, or displacement of wildlife caused by construction of linear features and other permitted facilities.

Off-road vehicular travel for “necessary tasks” would not be allowed, but exceptions would be considered on a case-by-case basis. These OHV restrictions would reduce impacts to wildlife habitat by limiting surface disturbance and potential channeling of water away from riparian/wetland areas, as well as soil and vegetation compaction. Therefore, these actions would help reduce OHV-related impacts.

The Laramie Plains Lakes SRMA would be managed as an ACEC. Management actions would be designed to maintain, restore, and protect potential habitat for the endangered Wyoming toad, and to develop partnerships with adjacent landowners for cooperative management to improve riparian habitat for a diversity of wildlife species. This designation allows the BLM to implement additional management requirements to protect sensitive resource areas, such as wetland/riparian areas.

The Laramie Plains Lakes SRMA would be managed to provide water-related recreational opportunities, and restrict OHV use to limited to designated roads or vehicle routes. Although associated recreation may lead to additional use in the riparian area and would impact wildlife through direct or indirect physical harm (e.g., through trampling), or introduction of harmful fungi from other wetland/riparian areas, such impacts would not be as prevalent as those discussed under Alternative 1.

Management actions related to water quality, watershed, and soils management would be the same as those identified under Alternative 1. This would protect a diversity of species and habitats, including the endangered Wyoming toad, during critical periods.

Wildlife and fisheries management would include intensive management of surface disturbing and disruptive activities to maintain or enhance amphibian species and their habitats. Surface disturbing activities can result in habitat loss, degradation, fragmentation, and displacement of potential Wyoming toad populations. This would also increase the potential for the introduction and proliferation of invasive plant species, potentially harmful to riparian vegetation. Habitat and T&E species conservation measures would be applied to all surface disturbing and disruptive activities to reduce or eliminate these potential impacts. Surface disturbing and disruptive activities would not be allowed within 500 feet of riparian habitat. These management actions would protect sensitive riparian habitats within the Laramie Plains Lakes area for the purpose of protecting the diversity of wildlife species. Such protection would include periods of time associated with essential life history requirements of species.

Summary

Closure of the ACEC to operation of the public land laws, locatable minerals, new oil and gas leasing, and mineral material disposals would protect wildlife habitat, specifically that required to protect the Wyoming toad. Actively pursuing acquisition of lands or easements to enhance access to the area under this alternative would increase the public land available for management of potential Wyoming toad habitat, but also would increase human presence. However, the use of BMPs and mitigation for habitat improvement or protection would reduce negative impacts.

4.13.13.5 Impacts Under Alternative 4: Proposed Plan

Air quality, cultural resources, fire and fuels, forestry, lands and realty, livestock, paleontology, recreation (with the exception of the Laramie Plains Lakes SRMA), SD/MAs (with the exception of the Laramie Plains Lakes Potential ACEC), socioeconomics, transportation and access management, vegetation, visual resource management, and wild horse management would be the same as Alternative 1.

OHV management within the Laramie Plains Lakes WHMA and management of the Laramie Plains Lakes SRMA would have the same impacts as those identified under Alternative 3.

Mineral actions would close public lands to locatable mineral entry and mineral material disposals within the Laramie Plains Lakes area. These actions would decrease or eliminate habitat loss, degradation, and fragmentation of potential wildlife habitat or displacement of wildlife from these sensitive habitats. Public lands would be open to oil and gas leasing with an NSO stipulation. Existing oil and gas leases would be intensively managed. Impacts would include habitat loss, degradation and fragmentation of potential wildlife habitat, and displacement of wildlife caused by construction of linear features and other permitted facilities. These actions may alter the ecosystem within the riparian habitat and negatively affect a diversity of species, especially the Wyoming toad. Although the potential for development within this area is low, intensive management of surface disturbing activities within or adjacent to the riparian/wetland vegetation complex would reduce or eliminate these impacts.

The Laramie Plains Lakes WHMA would not be designated as an ACEC, but would be managed as a WHMA. Impacts would be the same as those identified under Alternative 1.

Management actions related to water quality, watershed, and soils management would emphasize the protection and improvement of wildlife habitat. They would have the same impacts identified under Alternative 1.

Wildlife and fisheries management would include intensive management of surface disturbing and disruptive activities to maintain or enhance amphibian species and their habitats. Priority would be given to achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). This would result in the maintenance or enhancement of the vegetation component necessary, during critical periods, for a diversity of species and habitats, including the endangered Wyoming toad.

Summary

Impacts would be similar to Alternative 1. However, limiting OHV use and mineral entry activity would help maintain habitat for a diversity of species and habitats, including the endangered Wyoming toad. Closure of the ACEC to locatable minerals, and mineral material disposals, would protect wildlife habitat and reduce potential loss of habitat by reducing the probability of surface disturbing activities. Actively pursuing acquisition of lands or easements to enhance access to the area under this alternative would increase human presence. The use of BMPs and mitigation for habitat improvements or protection would be implemented to reduce negative impacts.

4.13.14 Historic Trails Potential ACEC

4.13.14.1 Impacts Common to All Alternatives

Little or no impacts to the historic trails are anticipated from management actions common to all alternatives associated with air quality, forestry, paleontology, transportation and access, or visual resource management.

Management actions associated with cultural resources would provide direct protection to the historic trails from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity (Appendix 5). They include measures such as cultural resource inventory, evaluation of NRHP eligibility, and mitigation of potential effects, generally through avoidance. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve the historic trails, mitigation measures would be prescribed case-by-case, depending upon the nature of the action. Mitigation measures would reduce the potential for significant effects to the historic trails. These management actions would apply to any proposed actions that have the potential to impact the trails.

Managing the historic trails in accordance with the cultural resource use allocations would ensure that they are appropriately managed and preserved. The historic trails are specifically identified for public use. As such, they would be managed for long-term preservation and would be interpreted for public education, as appropriate.

Where the integrity of setting contributes to NRHP eligibility, management actions resulting in visual elements that diminish the integrity of the property's setting would be managed in accordance with the Wyoming State Protocol and BMPs (Appendix 5). Potential effects would be determined by comparing the existing environment without the proposed action against the projected environment with the addition of the proposal. Potential effects would be minimized through the use of BMPs as discussed in Appendix 5. Additional mitigation measures would be developed on a case-by-case basis as necessary in consultation with the SHPO and other affected parties. This would provide protection for segments of the historic trails where they are located near these types of cultural properties.

Protective measures would be developed for threatened trail segments determined as a result of Section 110 inventory and monitoring, effectively minimizing any potentially significant impacts. These types of threats would generally involve activities or processes such as natural erosion or dispersed recreational activities. Protective measures would be site-specific, and based on the nature of the threat or impact. They would be developed in consultation with the SHPO and other affected parties, as appropriate.

Disturbance and loss of the historic trails would occur as a result of wildland fires and surface disturbances caused by suppression activities (e.g., construction of fire lines, bulldozing access roads, and general movement of heavy equipment). Loss of vegetation from wildland fires and suppression activities would increase the potential for soil erosion, resulting in the accelerated deterioration of the physical remains of the trails. However, wildland fires would generally enhance surface visibility (at least in the short term), allowing trail segments otherwise obscured by vegetation to be identified and recorded. Cultural resource specialists would provide data regarding historic trails to the fire incident commanders to ensure the trails are protected during suppression activities. In addition, cultural resource specialists would inventory fire lines and access roads where surface disturbance would be anticipated prior to suppression activities to ensure protection of the historic trails. Because of the unplanned nature of wildland fires, impacts to the historic trails from wildland fires and suppression activities are occasionally assessed subsequent to a fire. Post-fire rehabilitation and restoration efforts would help restore the setting of the historic trails damaged during large fire events. Some segments of the historic trails have been identified for special protections, and have been included in the specific fire management plans.

Lands and realty management, livestock grazing management, minerals management, recreation resources management, and wildlife and fisheries management actions resulting in development projects within the setting of the historic trails that contribute to NRHP eligibility would be mitigated to minimize significant effects. Assessment of potential impacts would be conducted through viewshed analysis, on-site inspection, and photo analysis. Mitigation measures would be undertaken to minimize the visual intrusions that would dominate the landscape associated with the historic trails (Appendix 5). These

would include, but not be limited to, decreasing the height of structures, using paint and topography to blend structures into the background, enhancing reclamation of ROW corridors, and using materials that match the existing environment to construct access roads. Mitigation of developments in order to eliminate adverse effects to the setting should take place.

Lands and realty management actions not associated with minerals development would include alternative energy development (specifically wind energy) and transportation and utility ROW corridors. Areas with important resource values such as the historic trails would be avoided. However, because of the nature of these types of developments, significant impacts would be anticipated to the settings of the historic trails. Large-scale projects such as these dominate the landscape, compromising the integrity of the setting and feeling of the historic trails; values which make these resources eligible for the NRHP. Best management practices are generally not sufficient to mitigate such effects.

Acquisition of nonfederal lands (Appendix 6) would benefit the historic trails by potentially consolidating ownership of trail segments. BLM management actions would apply to the acquired portions, providing additional protective measures to maintain or enhance the integrity, setting, feeling, and association of the historic trails. Longer, contiguous segments of historic trails under the jurisdiction of the BLM would enhance public access and provide for better interpretation opportunities.

Implementing the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve soil stability and vegetation cover, thereby protecting the physical integrity and setting of the historic trails. Overuse of an area by livestock, wildlife, and wild horses would potentially accelerate soil erosion, leading to loss of the trail remains. In most instances, these types of impacts would be minimal. However, long-term impacts from grazing would potentially occur from repeated trailing over time, especially along fence lines, near water sources, and in sheltered or shaded areas. Proper construction of water developments and range improvements, and proper placement of salt and mineral supplements, would help minimize adverse impacts to the historic trails. Any potential impacts to the trails would be evaluated prior to the construction of fences, water developments, and other range improvements, and appropriate mitigation measures would be implemented if needed.

Activities associated with minerals management have the greatest potential to directly and indirectly impact the historic trails because of the amount of disturbance proposed for the life of the plan. Unlike many of the other resource management actions, however, the proposed disturbance from minerals management would be limited to specific areas within the RMPPA (Map 4-7). Approximately 174 miles (27 percent of the 635 mile total) of the historic trails overlap high and moderate oil and gas potential areas. Most of the high and moderate oil and gas potential areas that overlap the historic trails areas have been previously leased, and the BLM must honor these existing rights. Significant impacts would occur in areas where the BLM must allow the lease holder to develop the lease and where adverse effects to the historic trails cannot be avoided. In most cases, the use of BMPs would mitigate the impacts, but special mitigation measures may be necessary on a case-by-case basis for specific projects. Impacts to the historic trails from geophysical exploration would be minimal with implementation of BMPs. Impacts from mineral material disposal activity would not occur. Mineral material permits are discretionary and would be denied. Impacts from locatable mineral activity would be minimal as the potential near the designated historic trails is generally low.

OHV use, including that for “necessary tasks,” would be allowed on only on portions of the trails where such use would not result in adverse impacts. Uses that would potentially cause an adverse effect would be evaluated on a case-by-case basis. This effort would ensure the protection of the physical integrity of the historic trails while allowing for appropriate OHV use. Inappropriate use of the historic trails by OHVs would result in physical damage, which may render segments noncontributing to the overall eligibility of the trails. Where impacts to the historic trails from OHV use are identified, closures to

motorized vehicle use may occur to protect the trails. OHV use on improved roads and over-the-snow vehicle use would have negligible effects on the historic trails. Travel, camping, historic reenactments, and other recreational activities would potentially affect the physical integrity of the trails. Impacts might include modification of original ruts and swales and displacement of associated historic artifacts and features. Interpretive signs and markers along the historic trails would be used to reduce these impacts by educating the public about the importance of historic preservation.

The Continental Divide National Scenic Trail SRMA, North Platte River SRMA, and Jelm Mountain SMRA overlap portions of the Historic Trails Area. Management of SRMAs would encourage recreation and development of facilities, which could result in damage to the historic trails directly through ground-disturbing activities, and indirectly through the larger presence of human activity. Cultural resource inventories and mitigation measures would be required prior to any new facility construction. However, management of the SRMAs would also allow providing information and education about historic resources in the area. This would increase community awareness for historic resources and reduce the potential for incidental or purposeful disturbance of cultural resources.

The Sand Hills ACEC and JO Ranch Expansion Area, Jep Canyon Area, Upper Muddy Creek Watershed/Grizzly Area, and Cow Butte/Wild Cow Area overlap portions of the Historic Trails Area. Protections afforded to these SD/MAs (i.e., intensive management of surface disturbing and other disruptive activities) would indirectly protect the historic trails in these areas by limiting the potential for impacts to trail remains or to the integrity of the associated setting. ROW exclusion requirements and NSO stipulations would provide the greatest level of protection by prohibiting surface disturbing activities.

The use of BMPs (Appendices 13, 14, 15, and 19) to minimize disturbance to vegetation would protect the historic trails by minimizing soil erosion, which would help prevent the degradation of the physical integrity of the trails. Achieving the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve vegetation cover and production, species diversity and litter, and soil stability, thereby maintaining the integrity of the setting and feeling of the historic trails. Reclamation practices would help restore the integrity of the setting of the trails in those areas where they have been previously compromised. Closure of areas of known populations of Special Status plant species to locatable mineral entry would protect the physical integrity of the historic trails from surface disturbing activities associated with mining, and also would maintain the integrity of the setting.

Water Quality, Watershed, and Soils Management actions, including intensive management and avoidance of surface disturbing and disruptive activities on unstable areas and near hydrologic features and resources, would indirectly protect the historic trails from physical impacts in those areas where they overlap with unstable areas and near hydrologic features. In addition, these management actions would preserve the integrity of the setting where it extends into these resource areas. Soils management would provide long-term, indirect protection by minimizing soil erosion, thereby preserving the physical remains of historic trails. Water development projects would require standard cultural resource inventory and mitigation measures to minimize impacts on the historic trails.

Impacts to the historic trails from periodic wild horse gathers would be minimal. Any potential for disturbance would be mitigated through standard cultural resource identification and avoidance measures.

Restrictions on surface disturbing and disruptive activities as a result of wildlife and fisheries management actions and from compliance with ESA would provide indirect protections for the historic trails. Intensive management of surface disturbing and disruptive activities in all RCAs (RCAs—18,400 acres) would potentially restrict the amount and size of surface disturbance, decreasing the potential for physical or visual impacts to the historic trails within these areas.

4.13.14.2 Impacts Under Alternative 1: Continuation of Existing Management

Little or no impacts to the historic trails are anticipated from management actions associated with air quality, forestry, paleontology, or wild horse management.

Management actions associated with cultural resources would provide direct protection to the historic trails from restrictions placed on surface disturbing and other disruptive activities. These protective measures are required by law prior to any surface disturbing and other disruptive activity (Appendix 5). They include measures such as cultural resource inventory, evaluation of NRHP eligibility, application of BMPs, and mitigation of potential effects, generally through avoidance. Specifically, areas within 1/4 mile of cultural properties, where the setting contributes to NRHP eligibility, would be avoidance areas for all surface disturbing and other disruptive activities. Where possible, this would protect the physical integrity of the historic trails from surface disturbing and other disruptive activities that may compromise the values making the trails eligible for NRHP. In those areas where inventory, evaluation, and avoidance are not considered adequate to preserve the trails, mitigation measures would be prescribed on a case-by-case basis, depending upon the nature of the action. Mitigation measures would reduce the potential for significant effects to the historic trails.

Land acquisitions to preserve cultural resources would increase protection of the historic trails that would otherwise fall outside of federal jurisdiction. Historic trail segments located within land acquisitions would benefit from protective measures afforded by cultural resource laws and regulations. Trail segments located outside of federal jurisdiction are not afforded the same protection measures and are more likely to be lost.

Wildland fire suppression activities (AMR) would consider protection of natural and cultural resources such as the historic trails. This would help reduce damage to the trails by considering these resources when determining the degree and location of surface disturbing suppression activities.

The lands and realty management program has identified 61,010 acres of lands for disposal under this alternative. Land disposals would potentially place segments of the historic trails outside of federal jurisdiction and protection. Cultural resource inventories and evaluations required prior to transfer of lands from federal jurisdiction would ensure that the historic trails are adequately documented, evaluated, and mitigated prior to ownership changes. Following the exchange criteria (Appendix 6), it is unlikely that parcels of land with historic trail segments would be disposed. BLM may retain or obtain lands containing important cultural and historic resources, such as the trails, and provide protection under federal management policies.

Approximately 63,670 acres would be closed to locatable mineral entry and future disposal actions. This would provide additional protection to the historic trails located within these areas by reducing surface disturbing and other disruptive activities. It also would eliminate the possibility of placing significant segments of the trails outside of federal jurisdiction.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Because of the large-scale nature of these types of developments, there would be the potential to adversely affect the historic trails, where the settings contribute to the properties' NRHP eligibility. Areas with important resource values such as the historic trails would be avoided where possible to reduce the impacts from these types of developments (Map 2-30). Where it becomes necessary to place the developments within the avoidance areas, intensive management would help reduce the impacts. However, large-scale projects such as these dominate the landscape, compromising the integrity of the setting and the feeling of the historic trails, values that make these resources eligible for the NRHP. Best management practices are

generally not sufficient to mitigate these types of effects. This is because many of these developments are visually obtrusive at distances greater than those identified for avoidance which would detract from the contributing setting.

In addition, development activities associated with oil and gas leasing, locatable mineral entry, and mineral material disposals within 1/4 mile of the incorporated boundaries of cities and towns (1,500 total acres) would be intensively managed. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect the historic trails within these areas.

The construction of livestock range improvements, including fences, spring developments, other water developments, and livestock exclosures, would disturb approximately 900 acres. Standard cultural resource inventory, recordation, and mitigation procedures conducted in conjunction with range improvement actions would protect the historic trails from significant damage, both to the physical remains of the trails and associated settings (Appendix 5).

It is anticipated that 8,945 oil and gas wells would be drilled over the life of the plan, disturbing approximately 62,000 acres of land, including all related facilities and pipelines. These numbers include both the federal and nonfederal wells proposed for the life of the plan within the high and moderate oil and gas potential areas. Approximately 174 miles of historic trails cross these high and moderate potential areas. 55 miles have been evaluated as contributing to the NRHP eligibility, and 104 miles have not yet been evaluated (Appendix 5). Standard cultural resource identification and mitigation measures conducted in conjunction with mineral development would protect the segments of the historic trails that are located on federally administered lands, or that are involved in federal actions associated with this development. Special stipulations would be added to new oil and gas leases where the historic trails have been identified to protect the values that make the trails significant.

Those wells proposed on nonfederal lands where there is no federal involvement would adversely affect both the physical remains of the historic trails and the integrity of the setting where it contributes to the NRHP eligibility. Significant impacts are apparent in portions of the checkerboard land pattern where development has obliterated the historic trails on state and private lands and has removed the values which made these segments eligible for the NRHP (Johnson, et al. 2005). In addition, development activities on nonfederal lands where there is no federal involvement would have a significant impact to the integrity of the setting of historic trail segments on adjacent federal lands, to the point where they would no longer contribute to the overall eligibility of the properties. Surface disturbance and well facilities would compromise the feeling of the associated landscape that characterizes the historic trails and makes them important and valuable historic resources.

Plans of operation would not be required for locatable mineral activities that would cause surface disturbances of five acres or less. These types of activities only require a notification. However, because the historic trails are protected by the NHPA, impacts must be considered even at the notice level. Impacts to the historic trails from these types of small exploratory activities would not be anticipated.

OHV use, including off-road travel to access camping sites and to retrieve big game kills, would have the potential to disturb the physical remains of the historic trails, especially under poor soil conditions. No areas open to OHV use overlap the historic trails area. However, areas limited to designated or existing roads and vehicle routes, and areas limited to existing roads and vehicle routes, do overlap the historic trails area. OHV use would be allowed on only those portions of the trails where such use would not result in adverse impacts. Uses that would potentially cause an adverse effect would be evaluated on a case-by-case basis. This effort would ensure the protection of the physical integrity of the historic trails, while allowing for appropriate OHV use. Inappropriate OHV use of the historic trails would result in

physical damage to the trails in the form of rutting and subsequent erosion, which may render segments non-contributing to the overall eligibility of the trails. Where impacts to the historic trails from OHV use are identified, closures to motorized vehicle use may occur to protect the trails.

Recreation areas would be managed to limit surface disturbance. Implementing an NSO stipulation for oil and gas development activities in the Nine Mile Hill and Laramie River recreation sites and intensive management of such activity within 1/4 mile of these sites would limit surface disturbance. These actions would thereby help prevent damage to the historic trails overlapping these areas. Closing developed recreation sites to locatable mineral entry and mineral material disposals would provide further protection from surface disturbing and other disruptive activities.

The Sand Hills ACEC and JO Ranch Expansion Area, Jep Canyon Area, Upper Muddy Creek Watershed/Grizzly Area, and Cow Butte/Wild Cow Area overlap portions of the Historic Trails Area. Surface use restrictions associated with management of SD/MAs would indirectly protect segments of the historic trails located in these areas. The Sand Hills area (7,960 acres), Jep Canyon area (13,810 acres), Upper Muddy Creek Watershed/Grizzly area (26,850 acres), Cow Butte/Wild Cow area (49,570), and North Platte River Area (5,060 acres) would require intensive management of surface disturbing and other disruptive activities. Intensive management would potentially restrict the amount and size of surface disturbance, thereby protecting both the physical remains of the historic trails and the associated setting in these areas.

The Cherokee Trail, Overland Trail, Rawlins to Baggs Road, and Rawlins to Ft. Washakie Road (66,370 acres) would be managed for the preservation of their historic values. The area within 1/4 mile, or the visual horizon, whichever is closer, of the historic trails would be an avoidance area for surface disturbing and other disruptive activities. In most cases, proposed facilities would be relocated outside of the avoidance area, which would protect the physical integrity of the trails throughout the RMPPA. If the location within the avoidance area cannot be avoided, mitigation measures would be required to reduce the potential for impacts to the historic trails (Appendix 5). The historic trails area would be open to locatable mineral entry and mineral material disposals. Even though the area is open, mineral material disposals are discretionary. They would not be allowed if there are resource conflicts, so the very presence of the historic trails could preclude authorization or sale of any mineral materials. Significant impacts would not be anticipated to either the physical remains of the trails or the associated setting.

Transportation and access management would include pursuit of new access to specific areas (Table 2-8) and consolidation of public lands to increase recreational opportunities in these areas. This would increase recreational use of the historic trails where overlap with acquisition occurs. Facilitating use of these areas would result in increased surface disturbing and other disruptive recreational activity and loss of vegetative cover, which would increase the potential for erosion and loss of the physical integrity of the historic trails.

This alternative would have no restrictions on road densities. Visual impacts from road development are typically minor and BMPs easily mitigate them. Where road densities become highly concentrated, the visual impact would accumulate to the point that it would dominate the setting of the historic trails, diminishing the values that make them eligible to the NRHP.

Vegetation and weed treatments would impact approximately 106,000 acres in the RMPPA over the life of the plan. Identification of the trails and mitigation measures conducted in conjunction with vegetation treatments would serve to protect the physical integrity of the historic trails from disturbance resulting from vehicle use and mechanical treatments. Implementing the Standards for Healthy Rangelands (USDI, BLM 1997) would maintain or improve soil stability and vegetation cover, thus protecting the historic trails. Over the long term, vegetation treatments would improve vegetation cover and soil stability and

would protect the physical integrity of the trails. Vegetation treatments would also restore a more natural landscape, which would potentially restore the setting of the trails where it has been previously compromised. In the short term, loss of vegetation from vegetation management actions would increase the potential for soil erosion, potentially altering the character of historic trails, which may render segments non-contributing to the overall NRHP eligibility. Vegetation treatments would generally enhance surface visibility in the short term, allowing otherwise undetected trail segments to be identified

Protections afforded Special Status plant species would indirectly protect the historic trails by restricting the amount and size of development that would disturb the physical trace of the trails. Activities associated with oil and gas leasing would be intensively managed in areas of occupied habitat for threatened, endangered, proposed, and candidate plant species. All surface disturbing activities would be intensively managed in blowout penstemon habitat. Recreational sites would not be authorized in Colorado butterfly plant habitat or in Ute ladies'-tresses plant habitat. These restrictions would help promote the natural vegetation communities, and would indirectly protect the integrity of the setting of the historic trails in these areas.

In all VRM management classes, activities would be mitigated to not compromise the objectives of the VRM class (Appendix 25). No segments of the historic trails occur within VRM Class I areas. Approximately 65.6 miles of the historic trails occur within VRM Class II areas. Structures and facilities located within VRM Class II areas would be required to blend in with the surrounding landscape when possible. This would help reduce the number of developments that would degrade the setting of the historic trails when they fall within these areas. Historic trails located in VRM Class III and IV areas would be subject to a higher level of surface disturbing and other disruptive activity, as these areas allow for moderate and high levels, respectively, of landscape alteration.

Increased erosion caused by surface discharge of produced water in the Colorado River Basin, the North Platte River Basin, and the Great Divide Basin would potentially cause adverse affects to the physical remains of the trails located near the stream channels. Sustained flows in ephemeral drainage systems would degrade the stream channels and accelerate cutbank erosion, which would destroy segments of the historic trails situated on the adjacent floodplains.

Surface use restrictions associated with management of wildlife and fisheries would indirectly protect segments of the historic trails located in specific areas by precluding development activities that would damage the physical remains of the trails or the integrity of the associated setting. Surface disturbing and disruptive activities would be intensively managed in RCAs (18,400 acres), neotropical and other migratory bird habitats, upland game bird habitats, amphibian habitats, reptile habitats, and crucial habitat for other sensitive species. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect the historic trail resources within these areas. In addition, well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence not allowed within 825 feet of active raptor nests (1,200 feet for ferruginous hawks), and avoidance of surface disturbing and disruptive activities within white-tailed and black-tailed prairie dog towns, would indirectly protect segments of the historic trails located within these areas from this type of disturbance.

Summary

Under Alternative 1, development activities where disturbance could not be mitigated through the use of avoidance or other BMPs would result in significant impacts to the historic trails. Development activities associated with wind energy, utility/transportation systems, and communication sites would significantly impact the historic trails where the setting contributes to the properties' NRHP eligibility. Large-scale

projects such as these dominate the landscape and compromise the integrity of the setting and feeling of the historic trails values that make these resources eligible for the NRHP.

Approximately 174 miles of the historic trails overlap high and moderate oil and gas potential areas. Most of the high and moderate oil and gas areas that overlap the historic trails have been previously leased, and the BLM must honor these existing rights. Significant impacts would occur in areas where the BLM must allow the lease holder to develop the lease, and where adverse effects to the historic trails cannot be avoided. It is anticipated that 8,945 oil and gas wells would be drilled, disturbing approximately 62,000 acres of land. Those wells proposed on nonfederal lands where this is no federal involvement would adversely affect both the physical remains of the historic trails and the integrity of the setting where it contributes to the NRHP eligibility, thereby causing a significant impact. In addition, development activities on nonfederal lands where there is no federal involvement would have a significant impact to the integrity of the setting of historic trail segments on adjacent federal lands, to the point that they would no longer contribute to the overall eligibility of the properties.

Restrictions on surface disturbing activities from cultural resource management, lands and realty management, recreation management, vegetation and weeds management, water quality, watershed, and soils management, wildlife and fisheries management, and management of the SD/MAs would indirectly protect the historic trails in these areas by limiting the potential for impacts to the trail remains or the integrity of the associated setting. No surface occupancy restrictions, intensive management, and the use of BMPs to minimize disturbance to sensitive resources would protect the historic trails by minimizing the amount and size of surface disturbance, thus decreasing the potential for physical or visual impacts within these areas. Approximately 185,130 acres would be subject to major constraints such as NSO, and 65,600 acres would be closed to leasing.

The area within 1/4 mile, or the visual horizon—whichever is closer—of the historic trails would be an avoidance area for surface disturbing and other disruptive activities. In most cases, proposed facilities would be relocated outside of the avoidance area, which would protect the physical integrity of the trails. Significant impacts to the trails would still be anticipated in those areas where impacts could not be adequately avoided or mitigated.

Approximately 65.6 miles of the historic trails occur within VRM Class II areas. Structures and facilities located within VRM Class II areas would be required to blend in the surrounding landscape when possible, reducing the number of developments that would degrade the setting of the historic trails when they fall within these areas.

4.13.14.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The impacts to the historic trails from air quality, forestry, OHV use, paleontology, SD/MA, transportation and access, water quality, watershed, and soils management, and wild horse management, would be the same as those identified in Alternative 1.

Impacts to the historic trails from cultural resource management actions would be similar to those identified in Alternative 1. However, land acquisitions to preserve and protect select cultural properties would not be as actively pursued. There would be less opportunity to acquire segments of the historic trails that are at risk or that provide for public use and education.

Impacts to the historic trails from fire and fuels management would be similar to those identified in Alternative 1, except that more wildland fires would be suppressed. Increased suppression and associated surface disturbance would potentially result in impacts to additional segments of the trails.

Impacts to the historic trails from lands and realty management would be similar to those identified in Alternative 1. An exception is that only 6,400 acres would be closed to locatable mineral entry and future disposal actions, thereby reducing the level of protection to the historic trails located in these areas by increasing surface disturbing and other disruptive activities. Further, 14,780 fewer acres of isolated and difficult to manage public lands would be available for disposal. Following the exchange criteria (Appendix 6), it is unlikely that parcels of land with historic trail segments would be disposed.

Impacts of livestock grazing management on the historic trails would be similar to those identified in Alternative 1, except that the construction of livestock range improvements over the life of the plan would disturb approximately 1,140 acres. Standard cultural resource inventory, recordation, and mitigation measures conducted in conjunction with range improvements would still protect the historic trails from significant damage to the physical remains and the integrity of the trail's setting (Appendix 5).

Impacts of oil and gas management actions on the historic trails would be similar to those impacts identified in Alternative 1. An exception is that 92,180 acres would be subject to major constraints such as NSO, and 64,150 acres would be closed to leasing. Overall, 9,198 wells would be drilled over the life of the plan, disturbing approximately 64,000 acres, including all related facilities and pipelines on federal and nonfederal lands. Impacts to the trails from the additional wells located on federally administered lands or that are associated with federal actions would be mitigated through standard identification and mitigation practices. However, this alternative would significantly affect additional segments of the historic trails and the associated setting on state and private lands.

Impacts to the historic trails from recreation management would be similar to impacts identified in Alternative 1, except that intensive management would not be required for surface disturbing activities within 1/4 mile of the North Platte River. Standard cultural resource identification and mitigation measures would protect the historic trails in these areas (Appendix 5).

Impacts from vegetation management actions on the historic trails would be similar to those identified in Alternative 1, except that vegetation and weed treatments would be increased to approximately 1,003,720 acres over the life of the plan. Cultural resource identification and mitigation measures conducted in conjunction with vegetation treatments would protect the historic trails from significant damage. This alternative would afford no additional protections to Special Status plant species. Therefore, there would be no indirect protections for the trails in these areas.

Approximately 42.9 miles of the historic trails occur within VRM Class II areas. As a result, compared to Alternative 1, fewer segments of the historic trails where the setting contributes to their NRHP eligibility would be protected.

Impacts to the historic trails from wildlife and fisheries management would be similar to those identified in Alternative 1, except that intensive mitigation of surface disturbing and disruptive activities would not be required in sensitive wildlife habitat areas. As a result, there would be no indirect protection of the historic trails because of avoidance of active raptor nests and white-tailed and black-tailed prairie dog towns. Standard cultural resource identification and mitigation measures (Appendix 5) would ensure protection of the historic trails in these areas.

Summary

Under Alternative 2, development activities where disturbance could not be mitigated through the use of avoidance or other BMPs would result in significant impacts to the historic trails. Development activities associated with wind energy, utility/transportation systems, and communication sites would significantly impact the historic trails where the setting contributes to the properties' NRHP eligibility. Large-scale

projects such as these dominate the landscape, compromising the integrity of the setting and feeling of the historic trails, values that make these resources eligible for the NRHP.

Approximately 174 miles of the historic trails overlap high and moderate oil and gas potential areas. Most of the high and moderate oil and gas areas that overlap the historic trails have been previously leased, and the BLM must honor these existing rights. Significant impacts would occur in areas where the BLM must allow the lease holder to develop the lease, and adverse effects to the historic trails cannot be avoided. It is anticipated that 9,198 oil and gas wells would be drilled, disturbing approximately 64,000 acres of land. Those wells proposed on nonfederal lands where this is no federal involvement would adversely affect both the physical remains of the historic trails and the integrity of the setting where it contributes to the NRHP eligibility, causing a significant impact. In addition, development activities on nonfederal lands where there is no federal involvement would have a significant impact to the integrity of the setting of historic trail segments on adjacent federal lands, to the point that they would no longer contribute to the overall eligibility of the properties.

Restrictions on surface disturbing activities from cultural resource management, lands and realty management, recreation management, vegetation and weeds management, water quality, watershed, and soils management, wildlife and fisheries management, and management of the SD/MAs would indirectly protect the historic trails in these areas. They would do this by limiting the potential for impacts to the trail remains or to the integrity of the associated setting. No surface occupancy restrictions, intensive management, and the use of BMPs to minimize disturbance to sensitive resources would protect the historic trails by minimizing the amount and size of surface disturbance, thereby decreasing the potential for physical or visual impacts within these areas. Approximately 92,180 acres would be subject to major constraints such as NSO, and 64,150 acres would be closed to leasing.

The area within 1/4 mile, or the visual horizon—whichever is closer—of the historic trails would be an avoidance area for surface disturbing and other disruptive activities. In most cases, proposed facilities would be relocated outside of the avoidance area, which would protect the physical integrity of the trails. Significant impacts to the trails would still be anticipated in those areas where impacts could not be adequately avoided or mitigated.

Approximately 42.9 miles of the historic trails occur within VRM Class II areas. Structures and facilities located within VRM Class II areas would be required to blend in with the surrounding landscape when possible, reducing the number of developments that would degrade the setting of the historic trails when they fall within these areas.

4.13.14.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts to the historic trails from air quality, forestry, paleontology, and wild horse management would be the same as those under Alternative 1.

Impacts from cultural resource management on the historic trails would be similar to those identified in Alternative 1. However, prohibiting surface disturbing and other disruptive activities within 1/4 mile or the visual horizon, whichever is closer, of historic properties where the setting contributes to NRHP eligibility would protect the physical integrity of the trail remains throughout the RMPPA. This would ensure protection from activities that may compromise the values that make them eligible for NRHP.

Fewer wildland fires would be suppressed under this alternative than under Alternative 1, causing fewer disturbances to the historic trails from suppression activities. Wildland fires would likely increase in size, which would result in removal of additional vegetation leading to increased soil erosion and consequential deterioration of the historic trail remains in those areas.

Retention of all lands available for disposal would maintain protections associated with federal management policies. Closure of 271,110 acres to operation of the public land laws and locatable mineral entry would result in additional protection to the historic trails located in these areas by reducing surface disturbing and other disruptive activities, and would eliminate the possibility of placing significant trails segments outside of federal jurisdiction.

The Historic Trails ACEC would be closed to new wind energy development, utility/transportation systems, and communication sites (Map 2-32). Closure of these areas would offer the greatest protection to historic trails from these types of surface disturbing activities. There would still be the potential to adversely affect those trail segments where the setting contributes to the properties' NRHP eligibility because of the large-scale nature of these types of developments. In addition, the area within 1/2 mile of the incorporated boundaries of cities/towns (4,500 total acres), that is open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals, would preclude surface disturbing and disruptive activities associated with minerals development. This action would indirectly protect the trails in these areas.

Impacts to the historic trails from livestock grazing management would be similar to those identified in Alternative 1. However, the emphasis on fence modification as opposed to new fence construction, and the emphasis on small-scale as opposed to large-scale water developments would result in the disturbance of 480 fewer acres. This would result in less potential for impacts to the physical remains or the integrity of the setting of the historic trails.

Impacts to the historic trails from oil and gas development would be similar to those impacts identified in Alternative 1. An exception is that 281,560 acres would be subject to major constraints such as NSO, and 86,210 acres would be closed to leasing. Overall, 8,632 wells would be drilled over the life of the plan, disturbing approximately 56,000 acres (including all related facilities and pipelines on federal and nonfederal lands) within the high and moderate oil and gas potential areas. Impacts to the trails from development located on federally administered lands or that are associated with federal actions would be mitigated through standard cultural resource identification and mitigation practices (Appendix 5). Significant impacts would still occur to the historic trails and associated setting on state and private lands.

Plans of operation would be required for locatable minerals activities that would cause surface disturbance regardless of the size of the disturbance in the Historic Trails ACEC. This action would prevent small exploratory disturbances from adversely impacting the historic trails, and would give the BLM more flexibility when considering the impacts of these types of proposals.

Impacts from OHV management actions on the historic trails would be similar to those identified in Alternative 1. An exception is that OHV use to access camping sites and to retrieve big game kills would be prohibited, thereby eliminating OHV-related impacts to the historic trails from these activities.

Impacts to the historic trails from recreation management would be similar to those identified in Alternative 1. An exception is that the Nine Mile Hill and Laramie River recreation sites, and the surrounding 1/2-mile area, would be open to oil and gas leasing with an NSO stipulation, and closed to locatable mineral entry and mineral material disposals. These actions would serve to reduce the potential for damage to the physical remains and the integrity of the setting of the historic trails in these areas by limiting the level of surface disturbing activities.

Those areas open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals would also preclude surface disturbing and disruptive activities that could potentially adversely affect the historic trails. These restrictions would be included in the North Platte River area (5,060 acres) and Jelm Mountain area (18,100 acres).

Impacts to the historic trails from SD/MAs would be similar to those impacts identified in Alternative 1. An exception is that management of surface disturbing and disruptive activities within the SD/MAs would be more restrictive. Those areas closed to new oil and gas leasing, and closed to locatable mineral entry and mineral material disposals, would preclude new surface disturbing and disruptive activities associated with mineral development. Most of the high and moderate oil and gas potential areas that overlap the historic trails areas have been previously leased, and the BLM must honor these existing rights. Significant impacts would occur in areas where the BLM must allow the lease holder to develop the lease. Adverse effects to the historic trails cannot be avoided. In most cases, impacts would be mitigated through the use of BMPs, but special mitigation measures may be necessary on a case-by-case basis for specific projects. These restrictions would be included in the Sand Hills ACEC and JO Ranch Expansion area (12,680 acres), Jep Canyon area (13,810 acres), Upper Muddy Creek Watershed/Grizzly area (59,720 acres), and Cow Butte/Wild Cow area (49,570 acres) SD/MAs.

Those areas open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals would also preclude surface disturbing and disruptive activities that could potentially adversely affect the historic trails. These restrictions would be included in the Historic Trails area (66,370 acres).

Those areas open to oil and gas leasing with intensive management of surface disturbing and disruptive activities would potentially restrict the amount and size of surface disturbance, decreasing the potential to adversely affect the historic trails located within the SD/MAs. This restriction would be included in the Continental Divide National Scenic Trail (600 acres) SD/MA. This area would also be closed to locatable mineral entry and mineral material disposals, which would preclude surface disturbing and disruptive activities that could potentially adversely affect the trails.

The historic trails would be protected from all surface disturbing activities in the Sand Hills and JO Ranch Expansion area (12,680 acres). Surface disturbance associated with existing oil and gas leases would be intensively managed to mitigate adverse impacts to the trails. There would be no adverse impacts from new fence construction or subsequent animal trailing and concentration in this area. The JO Ranch buildings (18 acres) would be stabilized and used as an interpretive center, providing a venue for public education on 19th century ranching and the roles of historic roads and trails throughout the area. The VRM Class II area around the JO Ranch buildings would indirectly protect the integrity of the setting of the historic trails.

Other restrictions associated with the SD/MAs would provide additional protections to the historic trails from surface disturbing activities not associated with minerals development. Surface disturbing activities would not be allowed within 1/4 mile of the historic trails. Surface disturbing and disruptive activities would be restricted or prohibited in aspen communities in the Upper Muddy Creek Watershed/Grizzly and Jep Canyon areas, and in aspen and mountain shrub communities within the Cow Butte/Wild Cow area. In addition, no new fences would be allowed within the Cow Butte/Wild Cow area.

The Historic Trails ACEC would include the Overland and Cherokee Trails, and the Rawlins to Baggs and Rawlins to Fort Washakie freight roads (66,370 acres). Surface disturbing activities would be prohibited within the ACEC, ensuring the protection of the physical remains of the trails from new disturbance. Surface disturbance associated with existing oil and gas leases would be intensively managed to mitigate adverse impacts to the trails. The trail segments where the setting contributes to NRHP eligibility would also benefit, because management actions would require structures to blend into the landscape, thus minimizing the occurrence of adverse effects to the setting (Appendix 5).

Where impacts from transportation and access activities to the historic trails are identified, road densities would not be allowed to exceed levels that diminish or adversely impact these resources. This would reduce the visual impacts to the integrity of historic trail settings from road proliferation.

Impacts from vegetation management actions on the historic trails would be similar to those identified in Alternative 1, except 806,840 acres would be treated over the life of the plan. Standard cultural resource inventory and recordation procedures would protect sensitive trail segments from significant damage. Managing for DPC would reduce erosion along the historic trails by enhancing specific plant communities that improve soil stability. In addition, occupied habitat for threatened, endangered, proposed, and candidate species would be open to oil and gas leasing with an NSO stipulation. This would provide additional protection to the historic trails by restricting surface disturbing activities that would potentially adversely affect their integrity.

Impacts to the historic trails from VRM management would be similar to those identified under Alternative 1, except approximately 42.9 miles of the historic trails occur within VRM Class II areas. The historic trail segments within these areas where the setting contributes to the NRHP eligibility would be protected from developments that would degrade the integrity of the setting (Appendix 5).

Impacts to the historic trails from water quality, watershed, and soils management would be similar to those identified in Alternative 1. However, water impoundments in the Muddy Creek Watershed (Map 2-20) that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. This would provide additional protection to the trails located in these areas by reducing surface disturbance, inundation, and the associated damage to the integrity of the historic trails and their associated setting.

Impacts to the historic trails from wildlife and fisheries management would be similar to impacts identified in Alternative 1. An exception is that restrictions on surface disturbing and disruptive activities would increase in sensitive wildlife habitat areas. Surface disturbing and disruptive activities with the potential to impact the physical remains of the historic trails and their associated setting would not be allowed within 1/4 mile of active raptor nests, within identified crucial habitat for sensitive species, within 50 meters of identified white-tailed and black-tailed prairie dog towns, and within 1/4 mile of the perimeter of occupied greater sage-grouse and sharp-tailed grouse leks. In addition, high-profile structures would be prohibited within 1 mile of active greater sage-grouse and sharp-tailed grouse leks. These restrictions would eliminate physical damage to the trail remains, and would eliminate disturbance and above ground facilities that would dominate the landscape, degrading the integrity of the setting of the trails.

Preservation of big game migration corridors and prohibiting water developments for livestock and wild horses in crucial winter range would indirectly protect the historic trails from disturbance caused by animal concentration and trailing in these areas. RCAs closed to new oil and gas leasing (18,400 acres) would also provide indirect protections to the trails from disturbance associated with mineral developments.

Summary

Under Alternative 3, development activities where disturbance could not be mitigated through the use of avoidance or other BMPs would result in significant impacts to the historic trails. Development activities associated with wind energy, utility/transportation systems, and communication sites would significantly impact the historic trails where the setting contributes to the properties' NRHP eligibility. Large-scale projects such as these dominate the landscape, compromising the integrity of the setting and feeling of the historic trails, values that make these resources eligible for the NRHP.

Approximately 174 miles of the historic trails overlap high and moderate oil and gas potential areas. Most of such high and moderate oil and gas areas that overlap the historic trails have been previously leased, and the BLM must honor these existing rights. Significant impacts would occur in areas where the BLM must allow the lease holder to develop the lease, and adverse effects to the historic trails cannot be avoided. It is anticipated that 8,632 oil and gas wells would be drilled, disturbing approximately 56,000 acres of land. Those wells proposed on nonfederal lands where this is no federal involvement would adversely affect both the physical remains of the historic trails and the integrity of the setting where it contributes to the NRHP eligibility, causing a significant impact. In addition, development activities on nonfederal lands where there is no federal involvement would have a significant impact to the integrity of the setting of historic trail segments on adjacent federal lands, to the point that they would no longer contribute to the overall eligibility of the properties.

Restrictions on surface disturbing activities from cultural resource management, lands and realty management, recreation management, vegetation and weeds management, water quality, watershed, and soils management, wildlife and fisheries management, and management of the SD/MAs would indirectly protect the historic trails in these areas by limiting the potential for impacts to the trail remains or the integrity of the associated setting. No surface occupancy restrictions, intensive management, and the use of BMPs to minimize disturbance to sensitive resources would protect the historic trails by minimizing the amount and size of surface disturbance, decreasing the potential for physical or visual impacts within these areas. Approximately 281,560 acres would be subject to major constraints such as NSO, and 86,210 acres would be closed to leasing.

Surface disturbing activities would be prohibited within the Historic Trails ACEC, ensuring the protection of the physical remains of the trails from new disturbance. Surface disturbance associated with existing oil and gas leases would be intensively managed to mitigate adverse impacts to the trails. The trail segments where the setting contributes to NRHP eligibility would also benefit, because management actions would require structures to blend into the landscape, thus minimizing the occurrence of adverse effects to the setting.

Approximately 42.9 miles of the historic trails occur within VRM Class II areas. Structures and facilities located within VRM Class II areas would be required to blend in the surrounding landscape when possible, reducing the number of developments that would degrade the setting of the historic trails when they fall within these areas.

4.13.14.5 Impacts Under Alternative 4: Proposed Plan

Impacts on the historic trails from air quality, fire and fuels, forestry, livestock grazing, OHV, paleontology, water quality, watershed, and soils management, and wild horse management, would be the same as those in Alternative 1.

Impacts resulting from cultural resource management would be the same as those in Alternative 1. An exception is that prohibition of surface disturbing and other disruptive activities within 1/4 mile or the visual horizon, whichever is closer, of historic properties where the setting contributes to NRHP eligibility would protect the physical integrity of the trail remains. This would ensure protection from development activities that may compromise the values making them eligible for NRHP.

Impacts to the historic trails from lands and realty management would be similar to those identified in Alternative 1. An exception is that only 16,980 acres closed to locatable mineral entry and future disposal actions would provide less protection to trail segments located in these areas by increasing the potential for surface disturbing and other disruptive activities. It also would eliminate the possibility of placing significant trail segments outside of federal jurisdiction. Further, 14,780 acres would be precluded from

disposal actions, which would keep segments of the historic trails under federal jurisdiction and available for public use. The area within 1/4 mile of the incorporated boundaries of cities/towns (1,500 total acres) open to oil and gas leasing with an NSO stipulation, and closed to locatable mineral entry and mineral material disposals, would preclude surface disturbing and disruptive activities. It also would indirectly protect the physical remains of the historic trails and the associated setting in these areas.

Impacts to the historic trails from oil and gas development would be similar to those identified in Alternative 1. An exception is that 218,750 acres would be subject to major constraints such as NSO, and 73,230 acres would be closed to leasing. Overall, 8,822 wells would be drilled over the life of the plan, disturbing approximately 58,000 acres, including all related facilities and pipelines on federal and nonfederal lands, within the high and moderate oil and gas potential areas. Impacts to the trails from development located on federally administered lands, or that are associated with federal actions, would be mitigated through standard cultural resource identification and mitigation practices (Appendix 5). Significant impacts would still occur to the historic trails and associated setting on state and private lands.

Impacts to the historic trails from recreation management would be similar to Alternative 1. An exception is that the area within 1/4 mile of the Nine Mile Hill and Laramie River recreation sites would be open to oil and gas leasing with an NSO stipulation. This would provide additional protection to the historic trails from disturbance where they overlap these areas.

Impacts to historic trails from management actions associated with the Continental Divide National Scenic Trail area (600 acres), North Platte River area (5,060 acres), and Jelm Mountain area (18,100 acres) would be similar to those identified in Alternative 3. An exception is that these areas would not be closed to locatable mineral entry, which would increase the potential for surface disturbing and disruptive activities that could potentially adversely affect the trails.

Impacts to historic trails from management actions associated with the Jep Canyon area (13,810 acres) would be similar to Alternative 1. In addition, surface disturbing and disruptive activities would be avoided in aspen communities within the Jep Canyon area. This would provide additional protection from adverse effects to the historic trails in these areas, by limiting the potential for impacts to the trail remains or to the integrity of the associated setting. However, this action would move development activities into more open areas, where remains of the trails are more likely to be and where the developments would be more visible, compromising the integrity of setting for the trails.

Impacts to historic trails from management actions associated with the Sand Hills and JO Ranch Expansion area (12,680 acres), Upper Muddy Creek Watershed/Grizzly area (59,720 acres), and Cow Butte/Wild Cow area (49,570 acres) would be similar to those identified in Alternative 3. An exception is that the Upper Muddy Creek Watershed/Grizzly area and Cow Butte/Wild Cow area would not be closed to locatable mineral entry, which would increase the potential for surface disturbing and disruptive activities that could potentially adversely affect the trails. Furthermore, surface disturbing and disruptive activities would be avoided in aspen communities and near riparian and wetland areas within the Upper Muddy Creek Watershed/Grizzly area, and avoided in aspen and mountain shrub communities within the Cow Butte/Wild Cow area. This would provide additional protection from adverse effect to the historic trails in these areas by limiting the potential for impacts to the trail remains or to the integrity of the associated setting. However, this action would move development activities into more open areas where remains of the trails are more likely to be and where the developments would be more visible, compromising the integrity of setting for the trails.

The JO Ranch buildings (18 acres) within the Sand Hills and JO Ranch Expansion area would be stabilized, and an interpretive program would be developed. This would provide the historic trails with a venue for public education on the importance of the historic trails and other historic properties on the

public lands. The VRM Class II area around the JO Ranch buildings would indirectly protect the integrity of the historic trails located nearby.

The Historic Trails area (66,370 acres) would be open to oil and gas leasing with an NSO stipulation and closed to mineral material disposals, which would preclude surface disturbing and disruptive activities that could potentially adversely affect the trails. The historic trails would be protected from other surface disturbing activities not associated with minerals development within 1/4 mile, or the visual horizon, whichever is closer, of the trails.

Impacts to the historic trails from transportation and access management would similar to Alternative 1. However, where impacts from transportation and access activities to the historic trails are identified, road densities would not be allowed to exceed levels that diminish or adversely impact these resources. This would reduce the visual impacts from road proliferation to the integrity of the historic trail setting.

Impacts to the historic trails from vegetation management would be similar to those impacts identified in Alternative 3. Vegetation and weed treatments (mechanical, biological, chemical, and prescribed fire) would include 828,460 acres over the life of the plan. Standard cultural resource inventory and recordation procedures conducted in conjunction with vegetation treatments would protect historic trail from significant damage.

Impacts on the historic trails from VRM management would be similar to those in Alternative 1, except that approximately 49.4 miles of the historic trails occur within VRM Class II areas. As a result, additional historic trail segments where the setting contributes to the NRHP eligibility would be protected from developments that would degrade the integrity of the setting (Appendix 5).

Impacts to the historic trails from wildlife and fisheries management would be similar to those impacts in Alternative 1. An exception is that surface disturbing and disruptive activities would be prohibited within 1/4 mile of the perimeter of occupied greater sage-grouse and sharp-tailed grouse leks. This would indirectly protect segments of the trails in these areas from activities that would compromise the values that make them eligible for the NRHP.

Summary

Under Alternative 4, development activities where disturbance could not be mitigated through the use of avoidance or other BMPs would result in significant impacts to the historic trails. Development activities associated with wind energy, utility/transportation systems, and communication sites would significantly impact the historic trails where the setting contributes to the properties' NRHP eligibility. Large-scale projects such as these dominate the landscape, compromising the integrity of the setting and feeling of the historic trails, values that make these resources eligible for the NRHP.

Approximately 174 miles of the historic trails overlap high and moderate oil and gas potential areas. Most of the high and moderate oil and gas areas that overlap the historic trails have been previously leased, and the BLM must honor these existing rights. Significant impacts would occur in areas where the BLM must allow the lease holder to develop the lease, and adverse effects to the historic trails cannot be avoided. It is anticipated that 8,822 oil and gas wells would be drilled, disturbing approximately 58,000 acres of land. Those wells proposed on nonfederal lands where this is no federal involvement would adversely affect both the physical remains of the historic trails and the integrity of the setting where it contributes to the NRHP eligibility, causing a significant impact. In addition, development activities on nonfederal lands where there is no federal involvement would have a significant impact to the integrity of the setting of historic trail segments on adjacent federal lands, to the point that they would no longer contribute to the overall eligibility of the properties.

Restrictions on surface disturbing activities from cultural resource management, lands and realty management, recreation management, vegetation and weeds management, water quality, watershed, and soils management, wildlife and fisheries management, and management of the SD/MAs would indirectly protect the historic trails in these areas by limiting the potential for impacts to the trail remains or the integrity of the associated setting. No surface occupancy restrictions, intensive management, and the use of BMPs to minimize disturbance to sensitive resources would protect the historic trails by minimizing the amount and size of surface disturbance, decreasing the potential for physical or visual impacts within these areas. Approximately 218,750 acres would be subject to major constraints such as NSO, and 73,230 acres would be closed to leasing.

The Historic Trails area would be open to oil and gas leasing with an NSO stipulation and closed to mineral material disposals. This would preclude surface disturbing and disruptive activities that could potentially adversely affect the trails. The historic trails would be protected from other surface disturbing activities not associated with minerals development within 1/4 mile, or the visual horizon—whichever is closer—of the trails.

Approximately 49.4 miles of the historic trails occur within VRM Class II areas. Structures and facilities located within VRM Class II areas would be required to blend in the surrounding landscape when possible, reducing the number of developments that would degrade the setting of the historic trails when they fall within these areas.

4.13.15 Blowout Penstemon Potential ACEC

4.13.15.1 Impacts Common to All Alternatives

Air quality management, forest management, paleontology management, recreation resources, other SD/MAs, visual resource management, and wild horse management would have little or no impact on the Blowout Penstemon Area.

Protection of cultural resource sites under the NHPA within the Blowout Penstemon Area (17,050 acres) would provide indirect, localized protection to uninhabited plant habitat when cultural resource sites overlap. However, the chance of this occurring is small. Application of the Wyoming State Protocol and BMPs (Appendix 5) would potentially minimize ground disturbance through project redesign, relocation of facilities, and/or preclusion of development in certain areas. This would help protect the unoccupied potential habitat within the area because occupied habitat already receives protection under ESA. At the same time, projects would be moved for protection of cultural resources into potential habitat, which would reduce potential habitat for the plant over time because of vegetation succession. Blowout penstemon is an early successional species which depends on moving dunes for its existence. The protection provided by cultural resource management would potentially result in stabilized dunes which would lead to late plant succession and unsuitable habitat for blowout penstemon.

AMR would emphasize the use of wildland fire for resource benefit and fuel reduction treatments. This would allow wildland fire to play its natural ecological role, subject to suppression needs. In some cases, wildland fire would be used as a tool to promote wind erosion by removing existing vegetation that has stabilized sand dunes. This would assist in expanding blowout penstemon into unoccupied habitat and creating new habitat for the species (Stubbendieck et al. 1989). Wildland fires would potentially increase the spread of weeds (i.e., cheatgrass and Russian knapweed), which are known to occur within adjacent areas of unoccupied habitat. Weeds have the potential to stabilize active sand dunes, which are the primary habitat for the blowout penstemon.

Lands and realty management actions would allow surface disturbing activities such as pipelines, power lines, and linear ROWs within unoccupied blowout penstemon habitat, which would potentially increase traffic and surface disturbance. Increased traffic and surface disturbance would potentially escalate the spread of weeds, thereby increasing competition for nutrients and water, limiting the potential expansion of blowout penstemon. Reclamation of disturbance is required. However, some disturbance in the stabilized vegetation portions of the project area would create new habitat by destabilizing the vegetated dunes and creating new areas for blowout penstemon colonization. Avoidance of unstabilized sand dunes for all surface disturbing activities would result in increased ecological stability for some of the dunes in the long term, thereby reducing the amount of available habitat for blowout penstemon. Blowout penstemon occurs in continuously active sand dunes. Within limits, activities or processes promoting wind erosion would favor the continuation of the species (Fritz et al. 1992).

Livestock grazing would potentially result in trampling of blowout penstemon plants, grazed, and in some cases uprooted. This would primarily occur when grazing coincides with the primary growing season for the plant. Surface disturbance associated with hoof action would potentially create colonization habitat for blowout penstemon. Grazing would potentially be beneficial because of the removal of adjacent competing vegetation. Conversely, grazing of blowout penstemon plants during extended periods of drought or during the plant's reproductive period would potentially reduce the viability of blowout penstemon populations. Grazing in some form has occurred for more than 100 years where these plants are present in the RMPPA. It is unknown to what extent overall impacts from livestock grazing have on the blowout penstemon. For example, it has been found that during non-drought conditions, grazing on blowout penstemon is minor, is confined mostly to occasional grazing of shoots, and can be stimulatory in breaking apical dominance (Fritz et al. 1992). However, when other forage is severely limited, as during drought conditions, severe grazing damage can occur. Livestock management actions would potentially result in the construction of new fences in occupied and potential blowout penstemon habitat. However, fences are typically not practical in sand dunes because of the high level of maintenance. When fences cross occupied habitat, livestock trailing along them trample the plants. Trailing along fence lines or to water sources would potentially destabilize dunes, and create new habitat or slow the vegetation stabilization of dunes. Livestock grazing would potentially lead to the introduction and spread of invasive weeds, resulting in greater competition between weeds and native vegetation and potentially limit the expansion of blowout penstemon.

Minerals management actions of permitting surface disturbing activities such as well pads, roads, and associated facilities would potentially increase traffic and the spread of weeds by vehicles and equipment, thus limiting the potential expansion of blowout penstemon. However, some disturbance in the stabilized vegetated dune portions of the area would create new habitat by destabilizing the vegetated dunes and create new blowouts for blowout penstemon colonization.

The blowout penstemon area is located within a low potential area of development for oil and gas production, and therefore there is little potential for such development to impact the blowout penstemon area. Locatable mineral potential within the blowout penstemon area is low; therefore, such impacts are also anticipated to be negligible. Mineral material potential is low, as the sand quality is common, and numerous alternate sources exist that are more accessible to transportation routes. Sales are discretionary, and permits would be denied if conflicts were identified.

Impacts from OHV management actions to the blowout penstemon area would limit vehicle use to existing roads and vehicle routes until the designation process is completed and roads are identified as opened limited or closed. Travel limited to existing routes would reduce the potential for plant mortality. However, where plants have established within existing routes, mortality would be potentially high from vehicles running over the plants. OHV and other activities would accelerate natural erosion, creating additional habitat for the plant. Driving over the plants would increase mortality (Fritz et al. 1992, Fertig

2001). Permanent or temporary closures would be enforced in specific areas and would be considered on a case-by-case basis to protect this endangered plant, ensure reproductive success, and continue plant viability.

ESA provides for protection of blowout penstemon and its habitat. However, potential habitat would not be provided protection under ESA. This would allow for surface disturbing activities within potential habitat, which would potentially reduce habitat capable of supporting expansion of plant populations. This would limit the opportunity for expansion beyond occupied habitat because of the constant disturbance from vehicles and equipment. In addition, this would increase the risk of weeds spreading and out-competing the blowout penstemon. The objectives within the Recovery Plan would be more difficult to achieve, reducing the likelihood of the plant to be down-listed or de-listed. In stabilized sand dunes where surface disturbance occurs and these dunes are destabilized, new habitat would potentially be created for the plants. Special management based on conservation measures adopted for the plant (Appendix 14) would not allow water developments within 1 mile of occupied blowout penstemon habitat. This restriction would reduce the potential for cattle or wildlife to trample or graze plant populations.

Transportation and access management would be maintained or modified to provide for safe and adequate access to the public lands. This would result in a loss of potential habitat within the management area. The probability of any roads being constructed in the area is minimal.

Vegetation management actions would maintain or enhance the habitat of the blowout penstemon, ensuring future survival of the plant. Conservation measures identified in the Biological Assessment/Biological Opinion (Appendix 14) would ensure continued viability of the species by precluding specific types of activities that are known to have adverse impacts on the plant.

Water quality, watershed, and soils management actions include intensive management of surface disturbing activities in areas that contribute to 303d listed waterbodies, identified watersheds, avoiding unstable areas, steep slopes, 500 feet from waterbodies and wetlands. Applying BMPs in these areas would likely reduce some surface disturbance and potentially change the design or location of proposed projects (Appendix 13). This would protect blowout penstemon habitat in the dunal area adjacent to the Pathfinder Reservoir and wetland features through avoidance.

Wildlife use would result in blowout penstemon plants being grazed, trampled, or uprooted. Surface disturbance associated with hoof action or the removal of adjacent competing vegetation by grazing would potentially create new habitat. Conversely, grazing of blowout penstemon plants during extended periods of drought or during the plant’s reproductive period would potentially reduce the viability of blowout penstemon populations. When wildlife use negatively affects blowout penstemon, consultation with the WGFD and vegetation management actions would be implemented to improve wildlife habitat in other locations to reduce grazing of the plant. Grazing would potentially lead to the introduction and spread of invasive weeds. This would result in greater competition between weeds and native vegetation and potentially limit the expansion of blowout penstemon.

4.13.15.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality management, forest management, paleontology management, recreation resources, other SD/MAs, transportation and access management, visual resource management, and wild horse management would have little or no impact on this area.

Protection of cultural resource sites under the NHPA within the area would provide indirect, localized protection to blowout penstemon potential habitat. Restricting surface disturbing activities within 1/4 mile

of cultural properties (if the setting contributes to NRHP eligibility) would reduce the level of disturbance within potential habitat areas and increase the potential for expansion of the population. However, blowout penstemon is an early successional species that depends on moving dunes for its existence. The protection provided by cultural resource management would potentially result in stabilized dunes which would lead to late plant succession and unsuitable habitat for blowout penstemon. Land acquisitions to preserve cultural resources would provide additional protection to blowout penstemon habitat, by placing the plant under federal jurisdiction, should land acquisitions overlap blowout penstemon habitat in the same area.

Wildland fire suppression activities would be managed for AMR, which would include consideration of natural resources. AMR would most likely result in suppression because of the intermixed land ownership. This would result in more late seral vegetation. However, as noted, blowout penstemon is an early successional species which depends on moving dunes for its existence. Suppression activities that don't involve damage to individual plants would generally be beneficial by creating disturbance areas that potentially would be colonized. Wildland fire would alter plant species composition in the short term, potentially resulting in alterations of the pollinators that the blowout penstemon plant would be dependant on for pollination.

Placement of new utility/transportation systems, wind energy facilities, and communication sites would avoid areas of important resource values (Table 2-5) such as known locations of blowout penstemon (248 acres). In situations where these areas would not be avoided, applicable BMPs or mitigation measures in coordination with USFWS would be required to ensure important resources are not adversely affected. Projects outside blowout penstemon occupied habitat would be allowed; therefore, surface disturbance would occur to potential habitat for the plant. The only protection for the plant would occur on occupied habitat on public land under ESA.

Surface disturbing activities have the potential to introduce invasive weeds, which would potentially lead to alteration of the populations of blowout penstemon. Invasive weed populations within an area are extremely difficult to completely eradicate. This would have to potential to reduce the population of the plant and completely dominate the plants' habitat. Any surface disturbance through sand dune blowouts would have the potential to alter dune movement, which would potentially create new habitat or lead to changes in distribution of the plant.

Livestock grazing would potentially result in trampling, grazing, and in some cases uprooting of blowout penstemon plants, which would primarily occur when grazing coincides with the primary growing season for the plant. Surface disturbance associated with hoof action would potentially create colonization habitat for blowout penstemon. Grazing would potentially be beneficial because of the removal of adjacent competing vegetation. Conversely, grazing of blowout penstemon plants during extended periods of drought or during the plant's reproductive period would potentially reduce the viability of blowout penstemon populations.

It is unknown to what extent overall impacts of livestock grazing have on the blowout penstemon. For example, it has been found that, during non-drought conditions, grazing on blowout penstemon is minor, is confined mostly to occasional shoots, and can be stimulatory in breaking apical dominance (Fritz et al. 1992). However, when other forage is severely limited, as during drought, severe grazing damage can occur. Livestock management actions would potentially result in the construction of new fences in occupied and potential blowout penstemon habitat. However, fences are typically not practical in sand dunes because of the high level of maintenance. When fences cross occupied habitat, livestock trailing along them would lead to trampling of plants. Trailing along fence lines or trailing to water sources would potentially destabilize dunes, create new habitat, or slow vegetation stabilization of dunes. Livestock grazing would potentially lead to the introduction and spread of invasive weeds, resulting in greater

competition between weeds and native vegetation and potentially limiting the expansion of blowout penstemon.

Within the minerals management program, leases would be issued with restrictions (Appendix 14) to protect resource values such as blowout penstemon. These restrictions would ensure development would not damage or remove individual plants or occupied habitat. However, potential habitat would receive little to no additional protection, and the plant would have less potential to expand into new areas. Continual surface disturbance from equipment and vehicle use or stabilization efforts within the dunes, including road construction, would alter sand movement. This would reduce habitat, thereby affecting the potential for colonization of new unvegetated dunal areas. Locatable mineral potential within the blowout penstemon area is low; therefore, impacts are anticipated to be negligible.

OHV management actions would limit motorized vehicle use to existing roads and vehicle routes. This action would reduce the potential for plant mortality. However, where plants have established themselves within existing routes, mortality would be potentially high from vehicles running over the plants. OHV use within the blowout penstemon area to access camping sites or retrieve big game kills would crush plants and increase the number of primitive routes within the blowout penstemon area. This disturbance would reduce the chances for blowout penstemon establishment to new areas because of continual disturbance from vehicular travel. However, allowance of some OHV use would create new habitat by destabilizing dunes. OHV use would have the potential to introduce weeds into known or potential habitat. This would create competition between invasive weeds and native vegetation that would limit the expansion of blowout penstemon.

The area would not be designated as an ACEC; therefore, it would not be afforded any further protection other than what is required under ESA. Allowing off-road vehicular travel for “necessary tasks” would destabilize dunes, increasing blowout penstemon potential habitat. The probability of “necessary tasks” occurring from minerals management in the area is low, so there would be negligible impacts from this minerals management. However, maintenance and construction of fence lines, pipelines, and power lines would potentially create new habitat. Where blowout penstemon already occurs, damage to the plants would potentially occur from vehicular travel.

Vegetation treatments would be used as a tool to improve habitat for blowout penstemon by reducing vegetation encroachment from later successional plants for this early successional plant’s habitat. Any vegetation management action that would promote stabilization of dunes would reduce potential habitat available for colonization by blowout penstemon. Treatments such as prescribed fires and chemical applications would create opportunities for colonization. This would be true as long as vegetation communities are not altered to the point that the number or composition of pollinators needed for blowout penstemon seed production is not dramatically reduced. Invasive weed management would keep weeds from encroaching and competing with blowout penstemon.

Water Quality, Watershed, and Soils Management actions that cannot avoid areas for soil and water resources would require mitigation and BMPs, which would likely change the design or location of proposed projects (Appendix 13). This would potentially protect occupied blowout penstemon habitat in dunal areas adjacent to the Pathfinder Reservoir and protect wetland features through avoidance.

Wildlife use would result in blowout penstemon plants being grazed, trampled, or uprooted. Surface disturbance associated with hoof action or the removal of adjacent competing vegetation by grazing would potentially create new habitat. Conversely, grazing of blowout penstemon plants during extended periods of drought or during the plant’s reproductive period would potentially reduce the viability of blowout penstemon populations. When wildlife use negatively affects blowout penstemon, consultation with the WGFD and vegetation management actions would be implemented to improve wildlife habitat in

other locations to reduce grazing of the plant. Grazing would potentially lead to the introduction and spread of invasive weeds. This would result in greater competition between weeds and native vegetation, and would potentially limit the expansion of blowout penstemon.

Summary

Activities within areas adjacent to occupied habitat would potentially increase the amount of potential habitat through destabilization of dune areas. Allowance of surface disturbing activities within potential blowout penstemon habitat would alter the distribution of the plant. Conservation measure restrictions (Appendix 14) on surface disturbing activities within occupied habitat would limit development and provide protection for the plant. Land tenure adjustments, including acquisition, would be pursued to reduce the effects of potential surface disturbance. BMPs would also be applied on activities such as linear facilities, wind farms, fences, and water developments.

4.13.15.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality management, forest management, paleontology management, recreation management, other SD/MAs, visual resource management, and wild horse management would have little or no impact on the Blowout Penstemon Area.

Cultural resources management, fire and fuels management (AMR), livestock management, minerals management, OHV management, Blowout Penstemon Area, vegetation management, water quality, watershed, and soils management, and wildlife/fisheries management action would have the same impacts as those identified under Alternative 1.

Lands and realty actions would be the same as Alternative 1, except there would be no land tenure adjustments (acquisitions and exchanges). The lack of land tenure adjustments would reduce the management opportunities that would potentially benefit blowout penstemon habitat. Blowout penstemon habitat located outside of federal jurisdiction would not be afforded the same protection measures. As a result, blowout penstemon habitat and plants would have a greater likelihood of being damaged because there are no penalties for the removal or destruction of plants on private or state lands under ESA.

Through the transportation and access management, acquisition of easements across private land within the management area would allow for improved access to monitor, inventory, and apply appropriate management to improve or maintain blowout penstemon habitat. Consolidation of public lands containing blowout penstemon habitat would gain the protection measures afforded by ESA once under federal jurisdiction. With larger blocks of potential and occupied habitat, management would become simplified, and would make the objectives of the Recovery Plan more attainable. Protection under federal control would result in continued viability of the species.

Summary

Impacts under this alternative would be similar to Alternative 1. An exception is that land tenure adjustments would not be pursued, potentially limiting management opportunities to manage larger blocks of land under federal ownership for the benefit of blowout penstemon habitat. In addition, blowout penstemon habitat and plants would have a greater likelihood of being damaged because there are no penalties for the removal or destruction of plants on private or state lands under ESA.

4.13.15.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, forest management, paleontology management, other SD/MAs, transportation and access, and wild horse management would have little or no impact on the Blowout Penstemon ACEC. In addition, surface disturbing activities would not be allowed within penstemon habitat; this action is similar to all management programs.

Impacts on the Blowout Penstemon ACEC from cultural resources management, recreation resources, visual resource management, and wildlife and fisheries management would be the same as those identified under Alternative 1.

The fire and fuels management would focus on the use of wildland fire to sustain an early successional active sand dune habitat. Management for early succession plant communities and active sand dunes would maintain and potentially expand habitat for the blowout penstemon.

The Blowout Penstemon ACEC (17,050 acres) would exclude new utility/transportation systems, wind energy facilities, and communication sites (Table 2-5) which would reduce surface disturbing activities that potentially would introduce invasive weeds.

Livestock management would have similar impacts to those described under Alternative 1, except that grazing would be managed to achieve DPC for blowout penstemon. This would result in adjustments to grazing systems and range improvements to enhance blowout penstemon populations.

Oil and gas leasing would be open within the ACEC. However, a NSO stipulation would be required within occupied blowout penstemon habitat. Blowout penstemon occupied habitat would be closed to locatable mineral entry, and mineral material disposal, and withdrawals would be pursued. These actions would protect the sensitive dune habitats required for the blowout penstemon.

OHV use would be limited to designated roads and vehicle routes and not be allowed for big game retrieval, and access to campsites. Closure of specific roads and vehicle routes would be considered on a case-by case basis to meet the objectives of the blowout penstemon ACEC. The objective of the ACEC is to minimize surface disturbing activities associated with development, recreation, and grazing within the area, while maintaining the habitat and meeting the objectives of the Blowout Penstemon Recovery Plan. These actions would reduce the potential for plant mortality. However, where plants have established within designated routes, mortality would be potentially high from vehicles running over the plants.

The Blowout Penstemon ACEC would pursue land tenure adjustments. Acquisition of nonfederal lands containing blowout penstemon habitat would gain the protection measures afforded by ESA once under federal jurisdiction. With larger blocks of potential and occupied habitat, management would become simplified and would make the objectives of the Recovery Plan more attainable. Protection under federal control would result in continued viability of the species. Disposal, through exchange, of potential blowout penstemon habitat would reduce the amount of protection afforded non-occupied habitat but, in return, would have the opportunity to gain occupied habitat to create larger blocks for better management. The acquisition of easements across private land within the management area would allow for improved access to monitor, inventory, and apply appropriate management to improve or maintain blowout penstemon habitat. Withdrawals from locatable mineral entry and mineral material disposal within the ACEC would protect potential blowout penstemon habitat and afford the same protections as occupied habitat. Motorized vehicle use would not be allowed for “necessary tasks”. This action would reduce the potential for plant mortality.

Vegetation management treatments would emphasize achieving DPC to benefit blowout penstemon by maintaining or modifying the habitat to sustain an early successional active sand dune habitat. Therefore, managing for early succession plant communities and active sand dunes would maintain sparsely vegetated, early successional, shifting sand dunes with crater-like blowout depressions created by wind erosion. An emphasis on invasive weed control would maintain a native and weed-free plant community, which would maintain habitat for the blowout penstemon.

Water Quality, Watershed, and Soils Management actions would include intensive management of surface disturbing activities in areas such as 500 feet from waterbodies and wetlands. Applying BMPs in these areas would likely reduce some surface disturbance and potentially change the design or location of proposed projects (Appendix 13). This would protect blowout penstemon habitat in dunal areas adjacent to the Pathfinder Reservoir and wetland features through avoidance.

Implementing protection measures (Appendix 14) associated with designation of the area as an ACEC would help to maintain and enhance blowout penstemon habitat by limiting surface disturbing activities within potential habitat and occupied habitat.

Summary

Fire and fuels management and vegetation treatments would emphasize achieving DPC, which would manage the area for early succession plant communities and active sand dunes, the required habitat for the blowout penstemon. Implementing protection measures associated with designation of the area as an ACEC would help to maintain and enhance blowout penstemon habitat by limiting surface disturbing activities within potential habitat and the sand dune complex. Motorized vehicle use would be limited to designated roads and vehicle routes, and would not be allowed for “necessary tasks,” big game retrieval, and access to campsites. Exceptions for “necessary tasks” would be considered on a case-by case basis. Priority for invasive weed control would be on creating a native weed-free plant community which would maintain blowout penstemon habitat. Establishment of an ACEC would provide additional protection measures to potential habitat while minimizing the potential spread of weeds into occupied habitat. Oil and gas leasing would be open within the ACEC. However, a NSO stipulation would be required within occupied blowout penstemon habitat. Blowout penstemon occupied habitat would be closed to locatable mineral entry and mineral material disposal, and withdrawals would be pursued. This would minimize disturbance to potential habitat and would maintain occupied habitat. Achieving the objectives of the Blowout Penstemon Recovery Plan and the establishment of an ACEC would promote the expansion of the plant, and potentially lead to downlisting or delisting of blowout penstemon as an endangered plant.

4.13.15.5 Impacts Under Alternative 4: Proposed Plan

Air quality management, forest management, paleontology management, recreation management, other SD/MAs, transportation and access, visual resource management, and wild horse management would have little or no impact on the Blowout Penstemon ACEC.

Cultural resource management and wildlife/fisheries management would have the same impacts as those identified under Alternative 1.

Fire and fuels management, lands and realty management, livestock management, OHV management, vegetation management, water quality, watershed, and soils management, and the ACEC designation of the area would have the same impacts as those identified under Alternative 3. Surface disturbing activities would be intensively managed to maintain or enhance habitat.

Management of mineral resources and the Blowout Penstemon ACEC would have impacts similar to those discussed under Alternative 3, except the ACEC would not be closed to locatable mineral entry, which would reduce the level of protection afforded to the sensitive dune habitats required for the blowout penstemon.

Summary

Surface disturbing activities would be intensively managed to maintain or enhance habitat. Fire and fuels management and vegetation treatments would emphasize achieving DPC, which would manage the area for early succession plant communities and active sand dunes, the required habitat for the blowout penstemon. Implementing protection measures associated with designation of the area as an ACEC would help to maintain and enhance blowout penstemon habitat by limiting surface disturbing activities within potential habitat and the sand dune complex. Motorized vehicle use would be limited to designated roads and vehicle routes, and not allowed for "necessary tasks," big game retrieval, and access to campsites. Exceptions for "necessary tasks" would be considered on a case-by case basis Priority for invasive weed control would be on creating a native weed-free plant community which would maintain blowout penstemon habitat. Establishment of an ACEC would provide additional protection measures to potential habitat while minimizing the potential spread of weeds into occupied habitat.

Oil and gas leasing would be open within the ACEC. However, a NSO stipulation would be required within occupied blowout penstemon habitat. Blowout penstemon occupied habitat would be closed to mineral material disposal, which would eliminate disturbance related to this activity. Achieving the objectives of the Blowout Penstemon Recovery Plan and the establishment of an ACEC would promote the expansion of the plant, and potentially lead to downlisting or delisting of blowout penstemon as an endangered plant.

4.13.16 Upper Muddy Creek Watershed/Grizzly Potential ACEC/WHMA

4.13.16.1 Impacts Common to All Alternatives

Air quality, forestry, paleontology, visual, WSA, WSR, SRMA, NNL, and wild horse resource management would have little or no impacts to the Upper Muddy Creek Watershed/Grizzly Area.

Cultural resource management actions would include protection measures that would influence or potentially preclude implementation of certain fish and wildlife management actions. Authorized excavation of cultural sites and cultural inventories would only have short-term impacts and would not be detrimental to fish and wildlife populations and habitat, given the limited footprint of such actions on the landscape. Land acquisitions within the Muddy Creek/Grizzly SD/MA intended to preserve cultural resources would benefit fish and wildlife resources by providing larger contiguous blocks of habitat on public lands.

The Upper Muddy Creek Watershed/Grizzly Area would be managed as an AMR fire suppression area. Disturbances, such as wildland fire, help maintain the diversity of riparian vegetation, resulting in healthier habitat (Naiman et al. 1993; Bisson et al. 2003). An example of this effect would be the use of fire to help regenerate desirable riparian vegetation in areas exhibiting encroachment by upland species. Additional changes to riparian ecosystems can result from the response of vegetation to fires outside the riparian zone. An example of this influence is the regeneration of aspen that can result from the top-killing of aspen during a fire. This would result in cloning new growth from the roots of the remaining viable trees. Additional aspen growth would then be available for in-stream uses by beaver, which would generally improve habitat conditions for various fish and wildlife species.

Disturbances from fire can also result in short-term impacts to upland and riparian habitat, including landslides, weed invasion, fire-related flooding, and increased sedimentation (Dwire and Kauffman, 2003). Several additional threats to fish and aquatic habitat are associated with fire suppression. Water used for fire suppression could contain parasites and other diseases (e.g., whirling disease) or result in the transfer of unwanted aquatic biota. To minimize the potential for negative impacts in the Upper Muddy Creek Watershed/Grizzly Area, water collected below a fish barrier will not be used in areas upstream. Equipment would also be cleaned to prevent disease transfer prior to use between different drainages.

Wildland fire would be beneficial or detrimental to wildlife and their habitats. For example, fire reduces dense understory that has mixed values for various species of wildlife. Fire also acts as a rejuvenator by returning nutrients to the soil. In late-successional vegetation communities, fire would return the vegetative community to an earlier stage of succession. The conversion of some late-seral stage stands to early and mid-seral would provide diversity in habitat, forage, and cover. This conversion negatively affects species adapted to late-seral forest types.

Habitat loss, degradation, fragmentation, and species displacement from linear features (e.g., power lines, roads, and pipelines) would occur. Increased road density and human presence would increase stress levels of wildlife during sensitive periods (e.g., breeding, migration, wintering) and increase habitat fragmentation. Impacts would be mitigated by adjusting the location, height, spacing, coloration, and density of infrastructure on the landscape. This would reduce disturbance to migration routes, wintering areas, and other sensitive habitats.

Road crossings of streams can fragment fish populations and limit the movement of aquatic species (Warren and Pardew 1998). Increased road density would affect aquatic habitat through the creation of additional flow paths and concentrated surface runoff, which would result in the siltation of cobble and gravel substrates required for fish spawning. Review of road design criteria and incorporation of fish passage needs would minimize these impacts.

The impact of new roads and other facilities on fish habitats can be divided into three categories: construction, presence, and urbanization (Angermeyer et al. 2004). During the construction phase, before interim reclamation, erosion of soils exposed during earth-moving activities accelerates fine-sediment loading in stream channels. Although the biological effects of sedimentation include a variety of ecological interactions (Waters 1995), sedimentation can act to shift habitat structure such as channel depth, pool-to-riffle ratio, percent fines in substrates, and cover availability (Angermeyer et al. 2004). This sediment can extend miles downstream of the construction site and persist in stream channels for years (Angermeyer et al. 2004).

During the presence phase, impacts are primarily associated with the interception of shallow groundwater flow paths by roads. Water is frequently diverted along the roadway and routed to surface water drainage networks at drainage crossings. This can, in turn, alter the timing, routing, and magnitude of runoff, triggering geomorphic adjustments through erosion by channel incision, new gully or channel head formation, or slumping and debris flows (Trombulak and Frissel 2000). Channel incision occurs when the base elevation of the stream channel adjusts to account for an alteration of geomorphic parameters, such as sediment supply, flow volume, or channel roughness (e.g., riparian vegetation). Channel incision has been shown to simplify channel geometry and result in the loss of pool habitats (Shields et al. 1994).

Roads provide dispersal mechanisms for a variety of exotic upland and riparian plant species. Of particular concern is the spread of tamarisk (*Tamarix*, also known as salt cedar) within the upper Muddy Creek watershed. This exotic species has been shown to displace native riparian vegetation while consuming a greater volume of water, resulting in reduced water tables and suitability of aquatic habitats (Graf 1978).

Water control structures and impoundments have been identified as one of the greatest threats to freshwater fauna persistence (Richter et al. 1997). Potential impacts of water control structures and impoundments include alteration of flow regimes, riparian areas, sources of non-native species, and the creation of barriers to fish movement. Loss of fish via entrainment associated with diversion structures and impoundments are also potential threats to fish (Beatty 2005; Moyle and Israel 2005). Management actions to minimize impacts from water control structures and impoundments will be considered on a case by case basis.

Land acquisition or disposal actions would be consistent with Land Exchange, Acquisition, and Disposal Criteria (Appendix 6). These actions would have an inherent benefit to fish and wildlife habitats associated with these actions. Nonfederal lands are not subject to federal land laws. Therefore, any acquisition of nonfederal land that includes high-value habitat would allow for mitigation of surface disturbance and disruptive activities, and management of contiguous fish and wildlife habitat.

Livestock grazing would result in direct competition with wildlife for forage, water, and space. In addition, disturbance from management activities, including the maintenance of existing range improvements, would occur. The continued modification of livestock grazing systems, and the development of new range management actions, would provide opportunities for improvement or maintenance of range conditions capable of supporting diverse wildlife and fish populations along with livestock use. These range conditions include water quality and watershed function, soil stability and erosion, and vegetation species composition, vigor, cover, and age-class structure. New fences constructed to BLM standards would decrease impacts to big game species by incorporating design elements that reduce injury and entanglement and facilitate easier passage of fences.

The impacts of livestock grazing management on stream processes and fish habitats have been well documented (Armour 1991; White 1996; Rinne 1999). These impacts include the loss of stabilizing riparian vegetation, which can lead to stream instability and an associated loss of habitat complexity; the loss of shading vegetation, which can lead to elevated stream temperatures and increased sediment delivery; and the loss of stream channel complexity provided by fluvial process and woody debris. These impacts can range from negligible to significant, depending on livestock grazing intensity, site characteristics, and fish species habitat requirements

Surface disturbing and disruptive activities from mineral resource development would reduce usable habitat and disrupt wildlife movement among crucial habitats, transitional areas, and parturition areas (Map 2-53; 2-56). When a contiguous habitat is fragmented by disturbing activities, it results in a reduction of usable ranges, isolation of species, impaired genetic integrity, and increased abundance of habitat generalists. Management actions to minimize disturbances to wildlife during sensitive life cycles can be found in Table 2-10 (Seasonal Wildlife Stipulations for all Surface Disturbing Activities). To reduce these impacts, surface disturbing activities would be intensively managed and would be subject to reclamation practices (Appendix 36)

Impacts to fisheries from mineral development include depletion of water, increased sediment delivery to streams, alteration of water temperature and flow regimes, and increased potential for elevated environmental toxicity. Road development associated with mineral resource development also impact fisheries through road crossings of streams that may inhibit fish movement and an increase in road densities. Road crossings and increased road densities can fragment fish populations, limit movement, and reduce the amount of available habitat important to aquatic species.

Surface disturbance associated with well pad construction would increase sediment delivery to streams and standing water systems, which would interfere with the life history strategies of native fishes or the abundance of critical habitats. For example, pool and run habitats with abundant hard substrates (e.g.,

cobble and gravel) in the Muddy Creek Watershed are often associated with fish communities dominated by BLM Wyoming sensitive fishes (Beatty 2005; Bower 2005). Increased sediment delivery can embed gravels and reduce spawning success via decreased embryo survival (Magee et al. 1996). Surface disturbing activities would be prohibited within 500 feet of riparian systems to reduce impacts to instream habitat and native fish assemblages.

The majority of the Upper Muddy Creek Watershed/Grizzly Area occurs within an area of high oil and gas development potential (Map 4-7). Disruptive activities from mineral development within big game crucial winter range would result in the loss of habitat, displacement, and physiological stress occurring from human presence and activity. The disturbed big game animal incurs a physiological cost either through excitement (preparation for exertion) or locomotion. A fleeing or displaced animal incurs additional costs through loss of food intake and potential displacement to poorer (lower-quality) habitat. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978). Operational activity from oil and gas development occurring during the winter on crucial winter range contribute, in varying degrees, to direct and indirect impacts to wildlife when the animals are most vulnerable.

Water depletions and surface discharge associated with coalbed natural gas (CBNG) development would also have a negative impact on native fish and the abundance of aquatic habitat important to these species. Water depletion within the Upper Muddy Creek Watershed/Grizzly Area has the potential to lower the water table or alter flow regimes enough to impede movement, reduce the amount of habitats critical for native fish, or decrease groundwater flows to surface waters. Conversely, surface discharge from CBNG development into Muddy Creek or its tributaries would result in a combination of increased erosion, alteration of water temperature and flow regimes, or bioaccumulation of chemicals toxic to aquatic biota. Long-term impacts from these actions would result in alteration of the natural aquatic ecosystem, including the alteration of fish assemblage composition and loss of habitats important for native fish to survive and reproduce.

OHV management activities that result in increased human presence would have a moderate localized impact on wildlife and fish species. Impacts to big game species would include displacement, altered seasonal use patterns, increased stress during critical periods and degradation of habitat. OHV use within riparian areas and stream channels would also have negative impact on bank stability and riparian vegetation. Temporary, seasonal, or permanent closures of motorized vehicle use would reduce or eliminate these impacts to fish and wildlife species.

Hiking, camping, hunting, shed antler hunting, sightseeing, and other recreational uses that result in human presence would increase the potential for wildlife displacement. Increased human presence throughout the year would result in displacement and heightened stress or flight response that would preclude animals from normal activities that allow for maintenance of optimal body condition. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Giest 1978). Recreational activities that occur within riparian areas would potentially result in the direct loss of riparian habitat and contribute to stream degradation.

The Historic Trails SD/MA (Cherokee, Overland, Rawlins to Baggs, and Rawlins to Fort Washakie) was developed to preserve and protect these unique cultural resources. Portions of the Historic Trails SD/MA occur within the Upper Muddy Creek Watershed/Grizzly Area. The protections afforded to these trails would also protect important fish and wildlife habitat within the Upper Muddy Creek Watershed/Grizzly Area.

Transportation routes can fragment aquatic and terrestrial habitats and degrade overall habitat quality. Transportation and access management routes can act as barriers to some species, especially in severe

winter conditions. For example, direct impacts from transportation routes on big game crucial winter range include loss of habitat and forage. Indirect impacts include displacement and physiological stress from human presence and activity during the winter. A fleeing or displaced animal incurs additional costs through loss of food intake and potential displacement to lower quality habitat. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978). Management actions to minimize disturbances to wildlife during sensitive life cycles can be found in Table 2-10 (Seasonal Wildlife Stipulations for all Surface Disturbing Activities).

Migration routes would also 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. Transportation routes would also increase public accessibility to areas that previously were inaccessible to vehicles during the winter and spring. This would increase adverse effects to wildlife as increased demands for use of public lands occur.

Impacts from transportation and access and the associated road network on fisheries would result from accelerated erosion throughout the area. This would impact native fish habitat by increasing sediment delivery to the streams. Impacts to riparian function would also occur and reduce the availability of hard substrate (gravels, cobbles) required by many native fishes. Upland habitat would also be degraded because of increased erosion.

Control of noxious and invasive weed species would reduce competition with native forage species. Improved vigor, health, and production from native plant species would maintain or improve forage for wildlife. However, application of weed control would cause short-term displacement of wildlife from treatment areas. In addition, there is the potential for loss of forbs important to wildlife during certain times of the year.

Incorporation of BMPs (Appendices 13, 14, 15, and 19) and other management actions (biological, chemical, mechanical, and fire treatments) to achieve standards for healthy rangelands would improve the health, vigor, structure, and diversity of vegetation communities. Improved health, vigor, and structure of vegetation communities would improve overall wildlife habitat condition.

Management actions designed to improve water quality and watershed health would generally benefit fish and wildlife species. Water Quality, Watershed, and Soils Management would maintain or restore habitat conditions through the establishment of avoidance zones around riparian areas. Surface use requirements within flood plains would create better habitat conditions for fish and wildlife species. Many of the wildlife species, including Special Status Species, present within the Upper Muddy Creek Watershed/Grizzly Area have adapted to current water quality and quantity conditions (e.g., highly fluctuating seasonal flow regimes).Therefore, maintaining these conditions would conserve habitat and viable populations. Management actions designed to remedy water quality impairments listed on the 303d list of impaired waterbodies would be evaluated on a case by case basis to ensure habitat suitability for native fishes.

Water Quality, Watershed, and Soils Management actions would construct approximately 10 headcut remediation projects and approximately 25 miles of stream restoration work. Headcut remediation projects may include the use of heavy equipment to adequately key in the structures and would potentially create barriers to fish passage. Stream restoration work would include limited use of heavy equipment and would be designed to improve fish habitat and passage.

Fish and wildlife management objectives (Table 2-1) in the Upper Muddy Creek Watershed/Grizzly Area would reduce impacts and improve or maintain habitat important to fish and wildlife species. Protections aimed at conserving vegetation, and limitations on surface disturbing and other disruptive activities,

would benefit fish and wildlife habitat. Developments, uses, and facilities would be spatially managed to minimize loss or alteration of wildlife habitat.

To protect the Colorado River cutthroat trout reintroduction area, 4,520 acres of public lands and 69,770,000 tons of federal coal would be unsuitable for further leasing consideration (Appendix 2). Therefore, increased impacts to fish and wildlife habitat from surface disturbing and disruptive activities associated with coal resource development would not occur.

The BLM actively participates in the Range-Wide Conservation Agreement for Roundtail Chub (*Gila robusta*), Bluehead Sucker (*Catostomus discobolus*), and Flannelmouth Sucker (*Catostomus latipinnis*) (Utah Department of Natural Resources 2004). Management actions in the Upper Muddy Creek Watershed/Grizzly Area would also benefit BLM Wyoming-administered, sensitive warm water fishes of the Colorado River Basin. Management efforts aimed towards maintaining suitable habitat conditions and connectivity among habitats would coincide with fish management objectives. The BLM also participates in the Conservation Agreement and Conservation Strategy for the Colorado River Cutthroat Trout (CRCT Task Force 2006A, 2006B). Implementation of management actions to enhance fish habitat and reestablish native fish populations would coincide with the conservation agreements and habitat management strategies for Colorado River Basin fishes. For instance, efforts to transplant Colorado River cutthroat trout and enhance instream habitat (e.g., willow plantings and removal of fish barriers) in the headwaters of the Muddy Creek drainage would conserve native fish fauna and associated habitats.

4.13.16.2 Impacts Under Alternative 1: Continuation of Existing Management

Existing management practices would continue. The Grizzly allotment portion of the Upper Muddy Creek Watershed/Grizzly Area (16,340 acres) would be managed as a WHMA (Map 2-10).

Air quality, forestry, paleontology, recreational, visual, WSA, WSR, SRMA, NNL, and wild horse resource management would have little or no impacts to the Upper Muddy Creek Watershed/Grizzly Area.

Impacts to the Upper Muddy Creek Watershed/Grizzly Area from fire and fuels, transportation, and access management would be similar to those described in the Common to All section above.

Proposed fish and wildlife habitat management projects would require a cultural clearance, which would prevent the implementation of certain fish and wildlife management actions. Authorized excavation of cultural sites and cultural inventories would only have short-term impacts. They would not be detrimental to fish and wildlife populations and habitat, given the limited footprint of such actions on the landscape. Land acquisitions within the Muddy Creek/Grizzly SD/MA intended to preserve cultural resources would benefit fish and wildlife resources by providing larger contiguous blocks of habitat on public lands.

Impacts to fish and wildlife from lands and realty management would include habitat loss, degradation, fragmentation, and species displacement resulting from linear features (e.g., power lines, roads, and pipelines) and other permitted facilities. Construction of linear features in the Upper Muddy Creek Watershed/Grizzly Area would not be avoided. These activities would degrade habitat types found in the Upper Muddy Creek Watershed/Grizzly Area, which would affect the diversity and abundance of species found in the proposed area. Increased road density and human presence would increase stress levels of wildlife during sensitive periods (e.g., breeding, migration, wintering).

Road crossings of streams can fragment fish populations and limit the movement of aquatic species (Warren and Pardew 1998). Increased road density would affect aquatic habitat through the creation of additional flow paths and concentrated surface runoff, which would result in the siltation of cobble and

gravel substrates required for fish spawning. Review of road design criteria and incorporation of fish passage needs would minimize these impacts.

The impact of new roads and other facilities on fish habitats can be divided into three categories: construction, presence, and urbanization (Angermeyer et al. 2004). During the construction phase, before interim reclamation, erosion of soils exposed during earth-moving activities accelerates fine-sediment loading in stream channels. Although the biological effects of sedimentation include a variety of ecological interactions (Waters 1995), sedimentation can act to shift aspects of habitat structure such as channel depth, pool-to-riffle ratio, percent fines in substrates, and cover availability (Angermeyer et al. 2004). This sediment can extend miles downstream of the construction site and persist in stream channels for years (Angermeyer et al. 2004). During the presence phase, impacts are primarily associated with the interception of shallow groundwater flow paths by roads. Water is frequently diverted along the roadway and routed to surface water drainage networks at drainage crossings. This can, in turn, alter the timing, routing, and magnitude of runoff, triggering geomorphic adjustments through erosion by channel incision, new gully or channel head formation, or slumping and debris flows (Trombulak and Frissel 2000). Channel incision occurs when the base elevation of the stream channel adjusts to account for an alteration of geomorphic parameters, such as sediment supply, flow volume, or channel roughness (e.g., riparian vegetation). Channel incision has been shown to simplify channel geometry and result in the loss of pool habitats (Shields et al. 1994).

Roads provide dispersal mechanisms for a variety of exotic upland and riparian plant species. Of particular concern is the spread of tamarisk (*Tamarix*, also known as salt cedar) within the Upper Muddy Creek Watershed. This exotic species has been shown to displace native riparian vegetation while consuming a greater volume of water, resulting in reduced water tables and suitability of aquatic habitats (Graf 1978).

Additional impacts would result from the development of water control structures and small-scale impoundments. If requests for ROW actions related to new water developments and impoundments are generated, NEPA analysis of potential adverse impacts would be required. Water control structures and impoundments have been identified as one of the biggest threats to freshwater fauna persistence (Richter et al. 1997). Potential impacts of water control structures and impoundments include alteration of flow regimes, riparian areas, sources of non-native species, and the creation of barriers to fish movement between areas needed to carry out important life history requirements (e.g., spawning and winter/summer refuge areas).

Public lands would be open to the operation of the public land laws. This would include land acquisition or disposal actions consistent with Land Exchange, Acquisition, and Disposal Criteria (Appendix 6). These actions would have an inherent benefit to fish and wildlife habitats. Nonfederal lands are not subject to federal land laws; therefore, any acquisition of nonfederal land that includes high-value habitat would allow for mitigation of surface disturbance and disruptive activities, and management of contiguous fish and wildlife habitat.

The development and implementation of livestock grazing systems is constrained by the allotment(s) in which each livestock operator has grazing preference. For instance, pastures have been created in most allotments to reduce the duration of grazing use by cattle, and where possible, use occurs during cooler seasons when the cattle distribute impacts more evenly between upland and riparian habitats. This has resulted in riparian habitat improvement in plant species composition, woody plant cover, and channel morphology on degraded locations. However, some allotments cannot be limited to cool season grazing use. Shortened duration of use during the warmer season would still result in habitat improvement, but at a slower rate and with limited expansion of woody plants. This in turn would slow the rate of improvement in water quality, channel function, and habitat for fish.

Range improvements would continue to be small in scale, with minimal amounts of associated surface disturbance. In the immediate vicinity of any new water developments, livestock use would reduce available forage and cover for wildlife and would shift livestock use from adjacent locations. Additional water sources would provide opportunities to adjust livestock grazing in order to allow vegetation to improve in production and cover, increase litter, and complete reproductive cycles. Case-by-case examination of all management actions would analyze the potential effects, ensuring that these actions would not result in degradation of the vegetation communities and the habitat it provides for wildlife and watershed health. Potential impacts (e.g. non-native fish, movement barriers, habitat alteration) to native fish assemblages will be considered for all water development projects.

Fences are livestock management tools which limit grazing animals to specific areas while providing for the needs of other resource values. This area was historically used for sheep grazing, which resulted in the construction of fences to control sheep. These fences are more restrictive to wildlife movement (particularly big game) than fences built to control cattle. Fences create travel barriers that alter animal distribution, result in stress and energy loss, and occasionally lead to death of big game from entanglement or injury. They also create flight obstructions for birds, and they serve as perches for songbirds and raptors. The conversion of fences to meet BLM standards would decrease stress and energy loss, injury, entanglement, and mortality. However, existing fences that do not meet current BLM standards would continue to impact big game species and other wildlife over a long period as the process of converting fences would not be conducted on a specific schedule.

Approval of bison grazing in this area would result in competition for forage with big game and conflicts over forage allocation and utilization, particularly in areas identified as crucial winter range. The need for stronger fences to control bison movement would result in greater barriers to big game movement, increasing stress, energy loss, and mortality. Topographic barriers in place of fences to control cattle would be replaced with new fences that would increase these impacts even further. The public extensively uses this area of blocked public land (Map 2-34) during the fall hunting seasons, so the presence of bison would create the potential for harmful interactions between bison and humans.

The Upper Muddy Creek Watershed/Grizzly Area would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities. Public lands within the Upper Muddy Creek Watershed/Grizzly Area would be open to locatable mineral exploration. Plans of operations would be required for locatable mineral exploration and development for disturbances of five acres or more. Casual use of locatable mineral exploration would be allowed within the area.

The Upper Muddy Creek Watershed/Grizzly Area is located in an area of high potential for oil and gas development (Map 4-7). Consequently, the potential for impacts from surface disturbing and disruptive activities associated with oil and gas development is also high, as described in the Common to All section. Intensive management and conservation measures would reduce the amount of crucial habitat lost (Appendix 14 and 15). In addition, restrictions on surface disturbing activities within crucial habitat during sensitive periods (i.e., big game crucial winter range, grouse nesting habitat, and raptor nests) would reduce the potential for stress to and displacement of wildlife species.

Surface water discharge associated with CBNG would be considered on a case by case basis. Impacts from CBNG-produced waters include altered chemical composition of streams, seasonal flow regimes, water temperatures, channel incision, loss or alteration to riparian areas, and alterations of sediment dynamics. In addition, CBNG waters are typically sediment-hungry, and can result in accelerated erosion. Bioaccumulation of unwanted elements downstream of discharge areas can have a negative impact to fish and wildlife species by elevating the environmental toxicity past the tolerable threshold of aquatic biota. Numerous contaminants have been identified, and are of concern because of their potential to negatively affect aquatic biota (Sutter and Tsao 1996). Many of these contaminants of concern can be found within

CBNG-discharged waters. However, reinjection of CBNG-produced waters would eliminate impacts associated with surface discharge to aquatic systems.

Impacts from OHV management activities would be similar to those described in the Common to All section. However, OHV travel for “necessary tasks” and to retrieve big game kills or to access campsites off existing roads would be allowed. Limited restrictions on OHV use would result in increased stress to big game species and increased soil erosion within the Upper Muddy Creek Watershed/Grizzly Area.

The Historic Trails SD/MA (Cherokee, Overland, Rawlins to Baggs, and Rawlins to Fort Washakie) was developed to preserve and protect these unique cultural resources. Portions of the Historic Trails SD/MA occur within the Upper Muddy Creek Watershed/Grizzly Area. An area within 1/4 mile or the visual horizon of the trail would be open to oil and gas leasing. It would be an avoidance area for surface disturbing and disruptive activities. The protections afforded to these trails would coincide with management goals and objectives for fish and wildlife within the Upper Muddy Creek Watershed/Grizzly Area.

Portions of Muddy Creek and Littlefield Creeks would be managed as eligible for WSR status (WSR segment from 2003 report). WSR management within the Upper Muddy Creek Watershed/Grizzly Area would prevent surface disturbing activities within 1/4 mile of the high-water line on either side of a designated stream reach. This protection would reduce the amount of sediment deposited into the stream and protect important habitat for fish and wildlife species.

Vegetation management would enhance the health and diversity of plant communities through the use of management prescriptions such as burning, plantings, and seeding, and chemical, mechanical, biological, or grazing treatments. This would increase forage and the diversity of wildlife habitat. Treatment efforts to control noxious and invasive weeds would occur on a small scale and would be inadequate to control the proliferation of undesired plant species. The spread of noxious and invasive plant species has the potential to reduce the overall quality and amount of fish and wildlife habitat.

Surface disturbing activities that occur within aspen communities would be intensively managed. Intensive management of aspen communities would improve big game habitat by providing forage and cover. However, vegetation treatments at the current level (Appendix 19) would not achieve management goals for the Upper Muddy Creek Watershed/Grizzly Area.

Surface disturbing activities would be avoided within 500 feet of perennial streams (e.g. Muddy, McKinney, and Littlefield creeks). Surface disturbing activities would not be permitted within 100 feet of ephemeral channels.

Surface discharge of produced waters that meet Wyoming surface water quality standards would be considered on a case by case basis in the Colorado River Basin (Wyoming DEQ 2001). Potential impacts from surface discharged, CBNG-produced waters include alteration to the natural flow and temperature regimes, changes in habitat, and accelerated erosion. In addition, changes to water chemistry downstream of CBNG-produced water discharge can occur. They have potential long-term impacts to the native fishes of the Colorado River Basin. Activities in the Muddy Creek watershed that result in water depletion would be mitigated through the recovery program (Appendix 11). However, off site-mitigation of water depletions through the recovery program would not benefit or eliminate impacts to the native fishes in the Muddy Creek drainage.

Several additional threats to aquatic species and habitat are associated with produced waters from CBNG development. If evaporation ponds were permitted for holding produced waters, catastrophic failure of reservoirs could occur (from storm events in excess of the predicted design of the ponds), and major

channel erosion would occur along with flooding downstream from the immediate release of pooled water. When reservoir failure occurs, sediment transport would reduce water quality downstream, by increasing turbidity and depositing sediment in pool and riffle, compromising habitat important for aquatic species.

Impacts from the construction of impoundments, instream structures, and road crossings would be minimized where possible. However, impacts associated with existing fragmentation and alteration of fish habitats from impoundments and instream structures would remain. Loss of fish via entrainment associated with diversion structures and impoundments is also a potential threat to fish (Moyle and Israel 2005). Management actions to minimize entrainment (e.g., screening) of fish in areas where developments are unavoidable or currently exist would be considered on a case by case basis.

Current wildlife management within the Upper Muddy Creek Watershed/Grizzly Area provides for the protection of big game crucial winter range by prohibiting surface disturbance and other disruptive activities from November 15 to April 30. This protects big game during use of the crucial winter range, but development activities are allowed outside of the timing stipulation. Therefore activities outside of this time frame can lead to habitat loss, degradation, and fragmentation. In addition, stipulations to protect raptors and sage-grouse would also help reduce, but not eliminate, impacts to wildlife habitat within the area.

Water developments within the Upper Muddy Creek Watershed/Grizzly Area have the potential to negatively impact Colorado River Basin fishes. Impacts include: fragmentation of habitats, loss of riverine habitats, alteration of flow regimes, and potential source habitats for invasive fish species (Beatty 2005). In areas where impoundments and instream structures are unavoidable, they would be designed to reduce impacts on Special Status fish species and their habitats. Protection of amphibian species and their habitats including: avoidance of (1) 100-year flood plains, (2) areas within 500 feet of perennial waters, springs, wells, and wetlands, and (3) areas within 100 feet of the inner gorge of the ephemeral channel would also benefit fish species in the Upper Muddy Creek Watershed/Grizzly Area. Fish habitats would be managed to achieve PFC and to allow fish passage at road crossings.

Water Quality, Watershed, and Soils Management actions would construct approximately 10 headcut remediation projects and approximately 25 miles of stream restoration work. Headcut remediation projects may include the use of heavy equipment to adequately key in the structures. This would potentially create barriers to fish passage. Stream restoration work would include limited use of heavy equipment and would be designed to improve fish habitat and passage.

Implementation of management actions associated with reestablishment efforts for Colorado River cutthroat trout would impact the Upper Muddy Creek Watershed/Grizzly area by improving habitat conditions for native coldwater fishes. The implementation of these reintroduction efforts above the confluence of Muddy and McKinney Creeks would primarily benefit coldwater fishes. However, this would not benefit the conservation of native warm water fishes found in the Upper Muddy Creek Watershed/Grizzly Area. This is because management efforts would not proactively address adjacent warm water habitat within the Upper Muddy Creek Watershed. These actions would not directly coincide with the management goals and objectives of the Range-Wide Conservation Agreement for Roundtail Chub (*Gila robusta*), Bluehead Sucker (*Catostomus discobolus*), Flannelmouth Sucker (*Catostomus latipinnis*) (Utah Department of Natural Resources 2004).

The removal, reconstruction, or alteration of existing instream structures that inhibit the movement of native fishes would be implemented to restore connectivity throughout the entire Upper Muddy Creek Watershed. Existing fish barriers installed to facilitate reintroduction efforts would be maintained until the completion of the reintroduction efforts. Short-term impacts of these strategically placed fish barriers

include habitat fragmentation and the creation of sink habitats However, the long-term benefit would be the reestablishment of a native fish assemblage free of invasive species that directly compete for resources and hybridize with native fishes (Bower 2005; Quist et al. 2006).

Summary

Protective measures afforded to cultural resources (e.g., historic trails) in the Upper Muddy Creek Watershed would benefit fish and wildlife by protecting habitats that occur within the 1/4-mile avoidance area. Impacts from oil and gas development would still occur because the majority of land in the Upper Muddy Creek Watershed/Grizzly Area is already leased. Consequently, management goals and objectives would not be met for the Range-Wide Conservation Agreement for Roundtail Chub (*Gila robusta*), Bluehead Sucker (*Catostomus discobolus*), and Flannelmouth Sucker (*Catostomus latipinnis*) (Utah Department of Natural Resources 2004). The same holds true for the Conservation Agreement and Conservation Strategy for the Colorado River Cutthroat Trout (CRCT Task Force 2006A, 2006B). In addition, loss of crucial big game winter range habitat within the Upper Muddy Creek Watershed/Grizzly Area would occur.

4.13.16.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Management would place an emphasis on the development of resources. The Upper Muddy Creek Watershed/Grizzly Area would be managed as a WHMA. A total of 59,720 acres would be managed (Map 2-11).

Air quality, forestry, paleontology, recreational, visual, WSA, WSR, SRMA, NNL, and wild horse resource management would have little or no impacts to fish the Upper Muddy Creek Watershed/Grizzly Area.

Impacts to the Upper Muddy Creek Watershed/Grizzly Area from cultural resource, fire and fuels management, and the Historic Trails SD/MA would be the same as those described in the Common to All section.

Impacts to the Upper Muddy Creek Watershed/Grizzly Area from cultural, water quality, watersheds, and soils management would be similar to those under Alternative 1.

Impacts on fish, wildlife, and associated habitat within the Upper Muddy Creek Watershed/Grizzly Area from lands and realty management would be similar to Alternative 1. However, management would focus on the development of resources. This would result in increased habitat loss, degradation, fragmentation, and species displacement from linear features (e.g., power lines, roads, and pipelines) and other permitted facilities (e.g., wind turbines)

Lands, realty, and minerals management actions would be allowed during crucial winter periods, increasing stress to wintering wildlife. Construction of linear features (e.g., power lines, roads, and pipelines) and other permitted facilities would result in habitat loss, degradation, and fragmentation, and temporary displacement of wildlife species. In addition, disruptive activities would be authorized in migration and transition ranges, which would increase stress to big game. Surface disturbing activities would be permitted in aspen communities. The timing stipulation would be reduced for active raptor nests during nesting, which would increase disturbance to nesting raptors. Surface disturbance areas would increase the potential for proliferation of invasive plant species, degradation of big game crucial winter range, and native fish species habitat.

Impacts from livestock grazing would be similar to under Alternative 1. However, there would be more emphasis on livestock production that would result in further development of water and fencing. These practices would expand livestock use into upland locations that previously had light to no utilization. Higher levels of livestock utilization would increase competition for forage with big game, particularly in areas identified as crucial winter range. Additional barriers to wildlife movement would increase physiological stress, energy loss, and mortality to big game species. Potential negative impacts (e.g., expansion of non-native fish, movement barriers, or habitat alteration) to native fish assemblages from water development projects would also increase.

Impacts to fish and wildlife from management of minerals would be similar to those under Alternative 1. Management efforts would focus on resource development. Thus, the potential for impacts as under Alternative 1 (e.g., habitat degradation) would be increased. For example, there would be a higher rate of CBNG-produced waters, surface disturbing activities, and other perturbations to fish and wildlife species and their habitat. Increased development activities would result in loss or alteration of critical habitats and increase stress, displace species, and lower reproductive success of wildlife. In addition, there would be no CSU restrictions around raptor nests. Further, the distance restrictions for timing stipulations for raptor nesting would decrease to 1/2 mile from 3/4 to 1 mile, increasing the potential to disturb nesting raptors, leading to possible nest abandonment. Therefore, impacts from minerals management would occur on fish and wildlife species and associated habitat and would include habitat loss, degradation, fragmentation, and species displacement. Impacts from off-road vehicular travel would be similar to those described in Alternative 1. Limited restrictions on OHV use would result in increased stress to big game species and increased soil erosion within the Upper Muddy Creek/Grizzly ACEC. Management actions would not be adequate to protect big game habitat during certain times of the year.

Impacts from transportation and access management would be similar to those under Alternative 1. However, management would focus on development of resources. This would result in an increase in transportation use and associated impacts. Increased road density would affect aquatic habitat through the creation of additional flow paths and concentrated surface runoff, which would result in the siltation of cobble and gravel substrates required for fish spawning. In addition, road crossings of streams can fragment fish populations and limit the movement of aquatic species (Warren and Pardew 1998). Review of road design criteria and incorporation of fish passage needs would minimize these impacts.

All designated segments of stream within the Upper Muddy Creek Watershed/Grizzly Area would be determined as non-suitable for inclusion in the National Wild and Scenic River System, and released from further consideration for WSR. These segments thus would not have additional protection to fish and wildlife habitat from a WSR designation.

Impacts from vegetation management would be similar to those described under Alternative 1. The exception is that, the increase in vegetation treatments, would increase grass and forb composition and minimize proliferation of weed species into native plant communities. There is not a similar action towards management of surface disturbing activities within aspen communities. The loss of aspen communities would have a negative impact to big game crucial winter range by reducing forage and cover and would not coincide with the management objectives for the Upper Muddy Creek Watershed/Grizzly Area.

The management of wetland/riparian areas to improve their PFC rating would improve fish habitat conditions. However, the PFC assessment methodology does not incorporate the habitat requirements of fishes and additional management would be necessary to ensure that habitats provide conditions suitable to meet the life history requirements of fishes.

Impacts from fish and wildlife management would be similar to those described under Alternative 1. The exception is surface disturbing and disruptive activities within big game crucial winter range would be allowed during the period of November 15 to April 30. Therefore, no protections are afforded to big game crucial winter range. Development activities in these habitats would result in loss or alteration of critical habitats and increase stress, displace big game, and lower over-winter survival of big game. Efforts to modify instream structures that are known fish barriers would not occur. Therefore existing fish barriers would fragment populations, create sink habitats, and prevent the reestablishment of native fish assemblages throughout the drainage.

Water development for livestock use would be allowed in big game crucial winter range. Impacts from these developments and wildlife management practices would be similar to those described under Alternative 1.

Summary

Impacts would be similar to under Alternative 1. The exception is that the potential for development activities would be greater; therefore, impacts would be proportionally larger. For example, the lack of wildlife timing stipulations would allow development activities to occur during critical periods. These would increase stress, displace species, and lower reproductive success of wildlife. Efforts to remove fish barriers would not be pursued and therefore management objectives for the Upper Muddy Creek/Grizzly Area would not be met. Emphasis on livestock grazing would increase impacts from pasture fencing and water development.

4.13.16.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Management would place an emphasis on the protection of resources. The Upper Muddy Creek Watershed/Grizzly Area would be designated as an ACEC (Map 2-8). The proposed area (59,720 acres) would be managed for BLM-sensitive fish habitat and big game crucial winter range.

Air quality, forestry, paleontology, recreational, visual, WSA, SRMA, NNL, and wild horse resource management would have little or no impacts to the Upper Muddy Creek Watershed/Grizzly Area.

Impacts to the Upper Muddy Creek Watershed/Grizzly Area from cultural resource and fire and fuels management would be the same as those described in the Common to All section.

Impacts from WSR management would be the same as those described under Alternative 1.

Impacts on fish, wildlife, and associated habitats within the Upper Muddy Creek Watershed/Grizzly Area from lands and realty management would be greatly reduced. The types of impacts to fish, wildlife, and habitats would still occur as described under Alternative 1. However, this alternative focuses on the protection of fish and wildlife habitat through restrictions on development and intensive management practices. Public lands would be closed to land tenure adjustments, including sale. Withdrawals would be pursued for locatable mineral entry and land tenure adjustment. The FLPMA allows for the retention and consolidation of public lands. Land and realty management that enhances connectivity of public lands having similar management objectives would benefit fish and wildlife species by allowing more effective application of management practices on larger spatial scales.

Emphasis would be placed on more intensive management to rapidly meet habitat improvement objectives. This would be achieved by daily herding, limiting livestock use to only cool season grazing, or full season rest from grazing on pastures. These actions would promote the quickest attainment of DPC, and fish and wildlife habitat management objectives on public lands. However, these grazing strategies

would potentially conflict with the ability of private landowners to cooperate with BLM objectives. This would lead to segregated grazing management or changes in land use as a result of economic burdens incurred by livestock operators. In the context of the checkerboard land pattern, this would be problematic for watershed scale management. One example would be the construction of additional fencing and the creation of barriers to wildlife movement, and increased stress, energy loss, and mortality to big game species. A second example would be changes in private land use to activities detrimental to BLM management actions at the watershed scale.

Range improvements would continue to be small in scale, with a reduction in associated surface disturbance resulting from a greater emphasis on fence conversions rather than new fences. In the immediate vicinity of any new water developments, livestock use would reduce available forage and cover for wildlife and would shift livestock use from adjacent locations. Protection and maintenance of existing water sources would be emphasized prior to development of additional water sources. This would lessen the flexibility to provide opportunities to adjust livestock grazing to permit improved production and cover for vegetation, increase litter, and complete reproductive cycles. Case-by-case examination of all management actions would analyze the potential effects, ensuring that these actions would not result in degradation of the vegetation communities and the habitat they provide for fish, wildlife, and watershed health.

Fences would all be built or modified to meet BLM standards. This would alter the types of fences big game pass through, under, or over, but would not reduce the number of fences they negotiate moving between summer and winter ranges. Impacts to big game and other wildlife such as stress, energy loss, change in animal distribution, and death or injury from entanglement would continue, but at a much lower rate. Fences would still create obstructions for birds to fly into and would serve as perches for songbirds and raptors. Trespass and control of livestock would become more problematic, as all fences were converted to meet BLM standards. Fence locations that receive more pressure from livestock, such as drainage crossings, fence corners, and locations close to water sources, would require more maintenance, but would likely not prevent livestock from crossing to the other side.

Bison grazing would be prohibited on blocked public lands in the Upper Muddy Creek Watershed/Grizzly Area (Map 2-34). Therefore impacts resulting from bison grazing described in Alternative 1 would not occur.

The Upper Muddy Creek Watershed/Grizzly Area would be managed as an ACEC and would be closed to new mineral leasing. Existing leases with surface disturbing activities would be intensively managed. Plans of operation for existing locatable mineral exploration and development would be required regardless of acreage (with the exception of casual use). However, the potential for locatable and salable mineral resource development in this area is relatively low.

The ACEC would be closed to locatable mineral entry and mineral material disposals, thereby eliminating impacts from these activities in this area. Impacts from minerals exploration and development would be reduced from those of Alternative 1 as a result of increased restrictions on the timing and/or location of surface disturbing activities. However, impacts described under Alternative 1 would still occur on private lands within the Upper Muddy Creek Watershed/Grizzly Area ACEC. The number of surface locations for oil and gas drilling would be determined from BMPs (Appendix 15) for crucial winter ranges and greater sage-grouse leks, which would reduce surface disturbance when compared with Alternative 1. Intensive management of surface disturbing activities (e.g., NSO, enclosures, avoidance areas, and timing stipulations) would minimize impacts on wildlife by reducing disturbance to raptors, greater sage-grouse, native fishes, wintering wildlife, and prairie dogs.

OHV use for “necessary tasks” would only be allowed through exceptions on a case by case basis. In addition, OHV use to retrieve big game kills or access camp site would be limited to existing roads and vehicle routes except where existing roads have been closed. OHV management would likely reduce stress to big game species and minimize soil erosion caused by OHV use in the Upper Muddy Creek/Grizzly ACEC. In addition, seasonal closures to motor vehicle use would be implemented as necessary to protect big game habitat by reducing OHV use during certain times of the year.

The Historic Trails (Cherokee, Overland, Rawlins to Baggs, and Rawlins to Fort Washakie) would be managed as an ACEC. Management goals of this ACEC are to (1) preserve and protect historic trails, (2) reduce threats from natural or human caused deterioration including conflicts with other resource uses, and (3) promote stewardship, conservation, and appreciation of historic trails. Portions of the aforementioned ACEC occur within the Upper Muddy Creek Watershed/Grizzly ACEC. Management objectives of the Historic Trails ACEC would typically benefit fish and wildlife by not allowing surface disturbing activities as per the NSO stipulation. Acquisition of land through withdrawals to protect historic trails would also benefit fish and wildlife (Appendix 6).

Impacts from transportation and access management would be similar to those under Alternative 1. Motorized vehicle use would be limited to designated roads and vehicle routes. In addition, closure of specific roads including seasonal closures would be considered on a case by case basis. Closure of specific roads within the Upper Muddy Creek Watershed/Grizzly Area would benefit fish and wildlife species. The reduction of transportation routes would provide better habitat conditions within big game crucial winter range and help meet management objectives.

An increase in vegetation treatments (biological and prescribed fire) would result in a mixture of early-, mid-, and late-seral conditions that would achieve the objectives of the fish and wildlife management area. An increased emphasis on maintaining weed free areas would minimize encroachment into native plant communities and maintain the integrity and production of native species valuable as wildlife habitat and forage. Vegetation management would be applied to meet rangeland health and watershed function and to meet DPC with an emphasis on Special Status Species by incorporating fish and wildlife habitat requirements in DPC and DFC objectives. Surface disturbing and disruptive activities in aspen communities would be restricted or prohibited. In addition, aspen stands would be managed to increase distribution and improve seral structure.

Management actions associated with water quality, watershed, and soils management would maintain existing hydrologic conditions and habitat connectivity required to provide suitable habitat conditions for the unique native fish fauna present in this watershed. Discharge of CBNG-produced water would not be allowed in the Colorado River Basin. Reinjection of CBNG-produced water would eliminate the potential for alterations of the aquatic environment in which the native fishes have evolved. Restriction of projects that (1) result in water depletions or (2) cause salt/sediment loading in the Colorado River Basin would similarly act to preserve local hydrologic processes required to maintain habitats of native fishes.

Impacts resulting from the construction of impoundments and instream structures such as headcut remediation projects would not be allowed where they conflict with habitat requirements of Special Status fishes. Design of road crossings to simulate natural stream processes would provide unimpeded movement among required habitats for fishes.

Avoidance areas within 1/4 mile of all ephemeral or perennial stream channels would minimize impacts on riparian habitats and associated aquatic species. This would limit the amount of alteration to local hydrologic processes caused by road development and surface disturbing activities. It also would act to maintain existing hydrologic conditions required to provide suitable habitat conditions for the unique native fish and fauna in the watershed.

Impacts from vegetation management would be the same as under Alternative 1. The exception is that actions would enhance the Upper Muddy Creek/Grizzly Area for fish and wildlife habitat by incorporating fish and wildlife habitat requirements in DPC and DFC objectives. Management of fish habitats to achieve their potential natural condition would benefit native fishes by increasing the amount of suitable habitat. DPC objectives and restrictions on surface disturbance within riparian areas and flood plains would maintain or improve watershed conditions and generally benefit fish and wildlife habitats.

Water developments within big game crucial winter range would not be allowed. This would benefit the native fish community in the Upper Muddy Creek Watershed/Grizzly Area by eliminating impacts associated with water developments under Alternative 1. Avoidance areas within 1/4 mile of all ephemeral or perennial stream channels would also benefit fish species in the Upper Muddy Creek Watershed/Grizzly Area. Fish habitats would be managed to achieve potential natural condition. Impoundments and instream structures would not be allowed where negative impacts would occur to habitat quality, habitat quantity, fish movement, or the life cycle requirements of Special Status fish species. In addition, road crossings would be designed to simulate natural stream processes.

Intensive management of mineral development within the Upper Muddy Creek Watershed/ Grizzly Area would facilitate fish management objectives. Waters produced from CBNG development activities in the Colorado River Basin would be reinjected, thus eliminating potential alterations of the highly fluctuating aquatic environment in which the native fishes have evolved. Impacts to native fish habitat (e.g., loss of rock substrate and deep pools) would also be reduced through maintaining natural sediment dynamics and flow regimes.

The BLM would actively pursue, in cooperation with WGFD, USFS, and private landowners, opportunities to expand reintroduction efforts for CRCT and other native cold and warm water fishes throughout the Upper Muddy Creek Watershed. This would constitute a meaningful conservation unit for the unique fauna of native warm water and coldwater fish species present in the Muddy Creek Watershed. Expanding reintroduction efforts for Colorado River cutthroat trout and other native cold and warm water fishes within the Upper Muddy Creek/Grizzly ACEC would act to preserve the native fish fauna of the Colorado River Basin in this isolated headwater system.

Summary

The Upper Muddy Creek Watershed/Grizzly Area would be managed as an ACEC. Objectives would emphasize enhancement and connectivity of habitats required to support the native fish fauna, greater sage-grouse, wintering big game species, and other wildlife in the area. The relevant and important values of the area would be afforded the greatest amount of protection under Alternative 3.

Impacts from oil and gas development would still occur on existing leases, because the majority of land in the Upper Muddy Creek Watershed/Grizzly Area is already leased. However, increased wildlife protection measures would result in fewer impacts, such as surface disturbance, to vegetative communities and fish and wildlife habitats when compared with the other alternatives. Impacts from lands and realty management actions, surface disturbance in aspen communities, OHV use, and minerals management would be reduced as a result of increased restrictions of surface disturbing activities. Intensive management of surface disturbing activities, through BMPs, timing and distance stipulations, and other mitigations, would minimize impacts on wildlife by reducing disturbance to raptors, sage-grouse, prairie dogs, native fishes, and wintering big game.

4.13.16.5 Impacts Under Alternative 4: Proposed Plan

Under the proposed plan the Upper Muddy Creek Watershed/Grizzly Area would not be designated an ACEC. However, the 59,720 acres would be managed as a WHMA (Map 2-13).

Air quality, forestry, paleontology, recreational, visual, WSA, WSR, SRMA, NNL, and wild horse resource management would have little or no impacts to fish and wildlife resources in the Upper Muddy Creek Watershed/Grizzly Area.

Impacts to the Upper Muddy Creek Watershed/Grizzly Area from cultural and fire and fuels management would be the same as those described in the Common to All section.

Impacts from lands and realty and minerals management under the proposed plan would be similar to those in Alternative 1 (Section 4.13.16.2).

Impacts from WSR management would be the same as those under Alternative 2.

Impacts to the Upper Muddy Creek Watershed/Grizzly Area from cultural resources, transportation and access, and the Historic Trails SD/MA, would be the same as those under Alternative 3.

Impacts from livestock management would the same as Alternative 1 (Section 4.13.16.2), except that bison grazing would be prohibited on blocked public lands in the Upper Muddy Creek Watershed/Grizzly Area (Map 2-34). Therefore impacts resulting from bison grazing would not occur.

The flexibility in development and implementation of livestock grazing systems would be enhanced by looking for solutions to grazing issues beyond the allotment level. This would include permitting temporary use in allotment(s) in which the livestock operator does not have grazing preference. However, in contrast to Alternative 3, it would foster coordination with other landowners to improve public lands and adjacent non-public lands. For example, in 2006 cattle use was transferred to a pasture within the Grizzly Allotment. This served to rest a pasture from cattle use in an adjacent allotment and to promote faster recovery of willows, bank stability, and channel morphology for fisheries habitat. (Several years of this type of treatment would be needed to meet fisheries habitat and water quality objectives.) Conversely, it would have taken much longer to meet riparian habitat objectives if warm season use was continued in this pasture. In this case, the needs of the habitat and the livestock operator were both met, and a segment of stream on private land that interconnects with public land segments was improved. Additional fencing to manage public lands differently from non-public lands would not be necessary and associated impacts to big game movements and to other wildlife would not be increased. This type of coordination and cooperation expands the potential solutions for resolving natural resource issues on a landscape scale, and builds support for similar efforts and successes in the future.

Fences would all be built or modified to meet BLM standards, or to meet the site-specific needs of habitat protection, wildlife, and/or livestock. For example, stronger and taller fences would be needed for enclosures, and rail top fences would be used for elk and deer migration areas. Fence locations that receive more pressure from—such as drainage crossings, fence corners, and locations close to water sources—would be constructed to minimize additional maintenance and animal trespass. Fences built to BLM standards would result in more negotiable fences for big game to pass through, under, or over, but would not reduce the number of fences they encounter while moving between summer and winter ranges. Impacts to big game and other wildlife such as stress, energy loss, change in animal distribution, and death or injury from entanglement would continue, but at a much lower rate. Fences would still create obstructions for birds to fly into and serve as perches for songbirds and raptors. Trespass and control of

livestock would be taken into account in fence construction or modification so that these issues do not become more problematic.

OHV travel off existing roads would be allowed for “necessary tasks”. However, OHV use to retrieve big game kills or access camp sites would be restricted to designated roads and vehicle routes. The reduction of off road vehicular travel would benefit fish and wildlife by preventing unnecessary stream crossing, by increasing degradation of riparian areas, and by reducing in sedimentation. However, impacts in areas where OHV use was allowed would be similar to those under Alternative 1.

Impacts from vegetation management would be the same as those under Alternative 3. Vegetation treatments (mechanical, biological, chemical, and prescribed fire) would result in a mixture of early-, mid-, and late-seral conditions that would maintain the production of native species valuable as wildlife habitat and forage. However, efforts to control noxious and invasive weeds would occur on a small scale and would be inadequate to control the proliferation of undesired plant species. The spread of noxious and invasive plant species has the potential to reduce the overall quality and amount of fish and wildlife habitat.

Impacts from water quality, watershed, and soils management would be similar to those under Alternative 1. However, water impoundments in the Upper Muddy Creek/Grizzly SD/MA (Map 2-13) that would result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. Restrictions on impoundments would allow for natural instream conditions and maintain habitat characteristics important for the persistence of native fishes in the watershed.

Impacts resulting from the construction of impoundments and instream structures such as headcut remediation projects would not be allowed where they conflict with habitat requirements of Special Status fishes. Design of road crossings to simulate natural stream processes would provide unimpeded movement among required habitats for fishes.

Impacts from fish and wildlife management under the proposed plan would be the same as under Alternative 1. The exception is that wildlife and fish management actions would enhance the Upper Muddy Creek/Grizzly Area for fish and wildlife habitat by incorporating fish and wildlife habitat requirements in DPC and DFC objectives. The design of road crossings to simulate natural stream processes would allow for the unimpeded movement of aquatic species.

Summary

Increased vegetation and weed treatments would help achieve the objectives of the wildlife and fisheries habitat management area. Increased wildlife protection measures would result in proportionally fewer impacts, such as surface disturbance, to vegetative communities and fish and wildlife habitats when compared with other alternatives. However, oil and gas development would be allowed on existing oil and gas leases. Consequently, impacts from oil and gas development would still occur throughout the majority of the Upper Muddy Creek Watershed/Grizzly Area as a result of the high percentage of existing leases.

The BLM would actively pursue, in cooperation with WGFD, USFS, and private landowners, opportunities to expand reintroduction efforts for CRCT and other native cold and warm water fishes throughout the Upper Muddy Creek Watershed.

4.13.17 Cow Butte/Wild Cow Potential WHMA

4.13.17.1 Impacts Common to All Alternatives

Air quality, forestry, paleontology, other SD/MAs excluding the Historic Trails SD/MA, transportation and access, VRM, and wild horse management actions would have little or no impact on the Cow Butte/Wild Cow Potential WHMA.

Protection of cultural resource sites under NHPA within the Cow Butte/Wild Cow Potential WHMA would provide indirect, localized protection to the vegetation communities and wildlife habitats associated with the Potential WHMA when cultural resource sites overlap with other resource values. Application of the Wyoming State Protocol and BMPs (Appendix 5) would potentially minimize ground disturbance through project redesign, relocation of facilities, and/or preclusion of development in certain areas. This would help protect the vegetation communities which support the array of critical wildlife habitats in the area.

Wildland fire suppression would reduce the acreage burned during times of the year when fire is the most damaging to vegetation and soils. Fire and fuels treatments would be conducted periodically to create or increase the mosaic pattern of vegetation that would minimize the size and intensity of wildfires. Treatments would also be designed to stimulate aspen regeneration and to diversify shrub communities. This would improve vegetation health, forage production, and soil stability, resulting in reduced potential for erosion and an increase in quality of wildlife habitat in the area. Wildland fire management in association with private and state lands would provide opportunities for the use of wildland fire for resource benefit as well as prescribed fires to improve rangeland vegetation condition. When needed, wildland fire rehabilitation and restoration efforts would reduce the time required for burned rangeland to return to a productive state and decrease the likelihood of weed infestations. Fuels treatments in industrial interface areas (existing oil and gas development activity and infrastructure) would contribute to the reduction in size and frequency of wildland fires that would maintain healthy, native plant communities.

Designation of right-of-way corridors which would include power lines, telephone lines, fiber optic lines, pipelines, and other linear-type ROWs outside of the Cow Butte/Wild Cow Potential WHMA (Table 2-3) would ensure protection of the vegetative communities by eliminating the potential for surface disturbance from these actions.

Management of livestock grazing to meet Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) would result in maintaining the vegetation communities of the Cow Butte/Wild Cow Potential WHMA, and would ensure that the area does not lose the values for which it was nominated a WHMA. Livestock use in this area generally occurs between June and October, when livestock competes with wildlife for forage, water, and space. Development of rotational grazing systems promotes livestock use in specific locations and times to sustain healthy vegetation communities, while also providing livestock-free areas for wildlife use at various times of the grazing season. Livestock grazing would potentially reduce the overall availability of forage, primarily grass and forbs, for wildlife species, but would in some cases increase forage palatability for big game wildlife.

Approximately 80 percent of the Cow Butte/Wild Cow Potential WHMA lies within areas of high and moderate potential for oil and gas development. The area is currently leased, with potential development for both oil and gas and CBNG. In most cases, CBNG extraction would require 80-acre well spacing with minimal potential for directional drilling because of the shallow depths of the gas bearing coals. Oil and gas development would include direct loss of habitat caused by well pads, roads, and related infrastructure; degradation of adjacent habitat caused by wind-borne dust; and fragmentation of habitat

and displacement of wildlife species from areas disturbed by authorized oil and gas activities and related human presence.

The amount of vegetation disturbed from gas development is not as important as the noise and activity levels that would still occur and would result in displacement of elk. With the increase in roads and potential recreational access to the area, displacement of elk is extremely likely during all phases of development. Construction activities remove elk crucial winter range vegetation and increase noise and human activity levels which displace animals. Much of the crucial winter range is on steeper south- and west-facing slopes that would be avoided to the extent possible during development. However, the proximity of acceptable well locations to the crucial winter range would still result in animal displacement. Displacement would result in elk moving into adjacent occupied habitats and into areas with deeper snow. Both of these changes would lead to increased stress, energy loss, decreased reproductive rates, and increased mortality of the animals.

Mineral development and geophysical exploration involves cross-country travel to stake project locations. Each of these cross-country trips crushes native vegetation, and increases soil susceptibility to erosion. These actions would temporarily reduce the quality of the vegetation communities and thereby temporarily degrade the big game crucial winter range and grouse nesting habitats. The prevalence of steep slopes and highly erodible soils allow for a higher potential for water-borne sediments to reach drainages. In addition to the direct removal of habitat caused by the development of wells and associated transportation facilities, disturbances from drilling activities and traffic would reduce wildlife use of the habitat immediately adjacent to these areas. Mineral development would improve access for hunters, as additional improved roads would be constructed into occupied deer habitat. This would potentially lead to increased animal harvest, adjustments to game management, and/or limiting access.

The development of oil and gas wells surrounding the 1/4-mile buffer around grouse leks would reduce the amount of habitat available for nest site selection. The birds would be required to either nest in less optimal locations or space their nests more closely. Increased noise resulting from CBNG-related traffic would possibly affect the ability of female grouse (both greater-sage and Columbian sharp-tailed) to locate leks, potentially reducing the reproductive viability of the species. CBNG development within the Cow Butte/Wild Cow Area would reduce the number of male grouse inhabiting leks within or adjacent to coalbed natural gas development. It would also increase fragmentation of plant communities used by grouse, degrading both nesting and brood-rearing habitat. The ability of these birds to move to adjacent, less disturbed habitat is extremely limited because of oil and gas development to the west and increasing elevation and snowpack to the east. Thus probable development would threaten sustained use of the area by sage grouse.

OHV management activities that result in increased human presence would primarily affect wildlife, vegetation, and soils/watershed resources. Disturbance of big game species would lead to displacement, altered seasonal use patterns, increased stress and energy loss during critical periods, and degradation of habitat. OHV use in riparian areas and stream channels would trample vegetation and reduce channel stability where bank damage occurs. Water running down roads on steeper slopes and/or more sensitive soils would result in greater soil erosion and sedimentation into drainages and reduced soil stability and vegetation production and species composition. Temporary, seasonal, or permanent closures of the roads that contribute most to these resource issues would minimize or mitigate the negative affects on wildlife and wildlife habitat.

Recreation management activities such as hiking, camping, hunting, shed antler collecting, and sightseeing that result in human presence would increase the potential for wildlife disturbance. Recreation activities would primarily occur from spring through fall, and would result in displacement and heightened stress, particularly during fall hunting seasons. Although not common, disturbance from over-

the-snow vehicles during the winter has the potential to more severely stress elk on crucial winter ranges, leading to reduced animal fitness and increased mortality.

Cow Butte/Wild Cow Area management would emphasize the vegetation, wildlife, and recreation values that characterize the area and for which this WHMA was proposed. The portion of this management area which overlaps with the Grizzly allotment would be guided by the existing MOU between the BLM and WGFD, along with additional coordination and consultation. The Historic Trails SD/MA also passes through the Cow Butte/Wild Cow Area, and within 1/4 mile or the visual horizon of the trail would be open to oil and gas leasing, although it would be an avoidance area for surface disturbing activities. The protections afforded to historic trails would reduce disturbance to vegetation and displacement of wildlife in those areas where the two resources overlap.

Vegetation management actions would maintain or improve the health of plant communities in the Cow Butte/Wild Cow Area, including aspen woodland, mountain shrub, big sagebrush, and grassland/riparian communities, and the habitat they provide for wildlife, particularly mule deer, elk, pronghorn, greater sage-grouse, sharp-tailed grouse, and raptors. Vegetation treatments would have short-term impacts on the Cow Butte/Wild Cow Area by reducing vegetation cover and increasing soil erosion. However, over the long term, vegetation treatments conducted at the appropriate times of the year would enhance plant vigor, vegetation cover, and species diversity.

Water Quality, Watershed, and Soils Management actions would avoid sensitive soil and water resources that would reduce erosion from surface disturbing activities. Although avoidance of these areas would influence some proposed developments, it would not preclude actions from occurring. A high proportion of the Cow Butte/Wild Cow Area is designated as an avoidance area for surface disturbing activities because of the presence of Cow Creek, numerous springs scattered throughout the area, and steep slopes. This area is predominantly finger ridges separated by steep canyons with stream channels draining to the west into Muddy Creek. Avoidance areas would likely result in facility construction on ridge tops or valley bottoms with interconnecting road systems. The effects of these construction activities include reduced water infiltration rates along roads and at facility locations. This in turn results in increased surface runoff, and less water available for plant maintenance, growth, and reproduction. These effects would be compounded when development on ridge tops reduces the capability or area available to water infiltration, promoting increased erosion from adjacent steep slopes and sedimentation into drainages below.

Maintenance or enhancement of wildlife habitat within the Cow Butte/Wild Cow Area, in coordination with the WGFD, USFS, USFWS, and other agencies, would benefit wildlife species by improving forage quality and quantity, increasing hiding cover, and reducing stress during critical periods. Conservation measures for T&E species, proposed and candidate species, sensitive species, and other wildlife would be implemented to promote sound management to conserve and preserve the species and their associated habitat, comply with Section 9 of ESA, and promote recovery as identified in the provisions of the ESA and BLM-sensitive species policies. Impacts to threatened, endangered, proposed, and candidate species have been analyzed in the Biological Assessment (USDI, BLM 2007a).

4.13.17.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, forestry, paleontology, other SD/MAs excluding the Historic Trails SD/MA, VRM, and wild horse management actions would have little or no impact to the Cow Butte/Wild Cow Area.

Impacts from cultural resources, fire and fuels, lands and realty, minerals, OHV, and recreation management would be the same as described in Common to All.

Livestock management actions would include water development projects to support livestock and the diversity of wildlife species that inhabit the area. Reservoirs project would potentially be larger in size, which would create habitat for fish populations. Some of these developments would be fenced to preclude livestock use to create wetland habitat and provide for waterfowl nesting and brood-rearing. These types of developments would be large enough to sustain water levels during drier periods, supporting wildlife and providing off-site water for livestock.

Fences are livestock management tools which limit grazing animals to specific areas while providing for the needs of other resource values. As this area was historically used for sheep grazing, many of the existing fences were constructed to control sheep. Sheep fences are more restrictive to big game wildlife movement than cattle fences. Fences create travel barriers that alter animal use patterns, cause energy loss and stress, and occasionally lead to death of big game from entanglement or injury. They also create obstructions that birds fly into and serve as perches for songbirds and raptors. The conversion of fences to meet BLM standards as reconstruction occurs would decrease wildlife energy loss and stress, injury, entanglement, and mortality. However, existing fences that do not meet current BLM standards would continue to impede movement of big game species and other wildlife for the long term until the completion of fence conversions.

Domestic bison grazing in this area would result in competition for forage with elk and conflicts over forage allocation and utilization, particularly in areas identified as elk crucial winter range. The need for potentially more restrictive fences to control bison movement would result in greater barriers to big game movement, increased stress, energy loss and mortality. As the Cow Butte/Wild Cow Area receives high recreational use at times, there would be a greater potential for conflicts between bison and humans.

The Cow Butte/Wild Cow Management Area overlaps the Historic Trails Potential ACEC along its western and southern boundaries. Avoiding surface disturbing activities within the Historic Trails area would reduce all surface disturbance-related impacts on the vegetation communities and associated wildlife habitat where the two areas overlap.

Vegetation management actions would implement treatments to sustain the health and diversity of plant communities, with an emphasis on aspen and mountain shrub stands. Application of treatments and minimizing the affects of surface disturbing activities within the aspen and mountain shrub communities in the Cow Butte/Wild Cow Area would help maintain the wildlife habitats (mule deer, elk, pronghorn, greater sage-grouse, sharp-tailed grouse, and raptors). Within these habitats, activities would be avoided when possible. In situations where activities cannot be avoided, developments and uses would be modified to ensure the least amount of disturbance to the wildlife populations that these sites support.

Water Quality, Watershed, and Soils Management actions for avoidance areas would likely result in facility construction on more level terrain along ridge tops or valley bottoms with interconnecting road systems. Road and pad design on steep slopes requires switchbacks, increased road length, increased culverts, more cut and fill slopes, more wing ditches, and so on (Appendix 13). This increase in complexity for road and pad design would alter overland surface flows and increase soil erosion and desertification of vegetation in the steep topography of the Cow Butte/Wild Cow Area. Applying BMPs to surface disturbing activities would reduce the amount of erosion. However, accelerated erosion as a result of these activities would still occur and would potentially degrade plant species composition as well as water quality in Muddy Creek.

Water Quality, Watershed, and Soils Management actions allowing surface discharge of produced water within the Cow Butte/Wild Cow Area would potentially accelerate erosion and deposition, altering stream channel characteristics beyond what would be expected with natural processes. Increased deposition and erosion to stream systems would change the channel dynamics and cause undesirable aggradation or

degradation. Cut banks would be more likely to slough on a continual basis, resulting in additional suspended sediments. During high-flow events, an increased potential for erosion would exist because of reduced infiltration and stream armoring by concentrating flows. In addition, there would be increased salt loading and degradation of water quality downstream and modification of the vegetation community to include more salt-tolerant species that have lower forage value for livestock and wildlife.

Wildlife management actions would apply spatial and temporal restrictions and mitigation measures to avoid or limit surface disturbing activities to protect sensitive wildlife habitat in the Cow Butte/Wild Cow Area. Vegetation resources would be completely protected in active raptor nesting areas, where surface disturbing activities are prohibited. Development would not be allowed to occur within 825 feet of active raptor nests (1,200 feet for ferruginous hawks) and during critical periods, including the winter months within crucial winter range. In addition, the areas within 1/4 mile of sage grouse leks would be avoidance areas. All these types of restrictions would serve to protect wildlife species during critical periods and critical areas necessary for species viability. As this area is proposed as a WHMA, protections designed for wildlife needs would maintain the habitat that supports many wildlife species.

Summary

Under this alternative, the Cow Butte/Wild Cow Area would not be managed as a WHMA. Further, surface disturbing and disruptive activities would be managed to reduce the potential for disturbance or loss of vegetation, increased soil erosion, human-induced stress to wildlife species, and habitat fragmentation. However, the portion of this management area which overlaps with the Grizzly allotment would be guided by the existing MOU between the BLM and WGFD, along with additional coordination and consultation, to protect and improve wildlife and fisheries habitat. Surface disturbing activities resulting from lands and realty and minerals management, and surface discharge of produced water, would remove and degrade portions of the vegetation communities. Intensive management of these activities would help reduce, but would not eliminate, these impacts. The limited restrictions on surface disturbing and disruptive activities under this alternative would allow for degradation of wildlife habitats, resulting in displacement of wildlife populations from large segments of the area.

4.13.17.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, forestry, paleontology, other SD/MAs excluding the Historic Trails SD/MA, VRM, and wild horse management actions would have little or no impact to the Cow Butte/Wild Cow Area.

Impacts on the Cow Butte/Wild Cow Area from cultural resources, fire and fuels, lands and realty, minerals, OHV, recreation, transportation and access, and water quality, watershed, and soils management would be the same as those under Alternative 1.

Impacts as a result of livestock grazing would be similar to those in Alternative 1. However, there would be more emphasis on livestock production that would result in further development of water and pasture fencing. These practices would expand livestock use into upland locations that previously had light or no utilization. Higher levels of livestock utilization would increase competition for forage with elk, particularly in areas identified as elk crucial winter range. Additional barriers to wildlife movement would increase the stress, energy loss, and mortality to big game species.

Impacts from the management of the Cow Butte/Wild Cow Area under this alternative would be similar to under Alternative 1. Without application of BMPs and intensive management of surface disturbing activities within mountain shrub and aspen stands, a higher degree of loss would occur with these less common communities and the wildlife they support. Wildlife species would be less likely to inhabit this

area, increasing competition in adjacent, occupied habitats and potentially resulting in loss of the values that would qualify the Cow Butte/Wild Cow Area as a WHMA.

Impacts from vegetation management involving increased size of vegetation treatments would result in reduced acreages of dense, mature/decadent shrub and aspen cover. In their place would be early seral stage communities, with greater species diversity, plant vigor, and production of vegetation, initially dominated by grasses and forbs, which would benefit cattle and elk. Hiding cover for mule deer and elk, and nesting and foraging habitat of songbirds and small mammals, would be reduced. As plant succession occurs, there would be improved diversity of shrubs, thus increasing forage for mule deer and Columbian sharp-tailed grouse. As shrub canopy and structure increases, the area would provide nesting and brood rearing habitat for greater sage-grouse. Some wildlife species would be less likely to inhabit this area until shrub and aspen stands regenerate, increasing inter- and intra-specific competition in adjacent occupied habitats. The vegetation communities would be managed to emphasize early seral stage rather than mosaics of mixed age and cover classes. Management actions would still be required to meet Standards for Healthy Rangelands, although there would be some loss of the wildlife habitat values that qualify the Cow Butte/Wild Cow Area as a WHMA.

This alternative would reduce wildlife management-related mitigation measures implemented under this program for all permitted actions. Elk would potentially be displaced from crucial winter range to private and state lands, less desirable or suitable habitat, or into other herd management units. Mule deer would also be displaced with similar effects, and potentially into habitat where competition with antelope would be greater, resulting in more intra-specific competition, energy loss, and mortality during severe winters. Raptors and grouse species would also be disturbed or displaced from surface disturbing and disruptive activities.

Summary

Under this alternative, the Cow Butte/Wild Cow Area would not be managed as a WHMA. Moreover, surface disturbing and disruptive activities would have reduced restrictions that in turn would increase the potential for forage loss, human-induced stress to wildlife species, and habitat fragmentation. However, the portion of this management area which overlaps with the Grizzly allotment would be guided by the existing MOU between the BLM and WGFD, along with additional coordination and consultation, to protect and improve wildlife and fisheries habitat. Enhanced livestock production would favor grassland communities over shrub communities. This would benefit some wildlife species (e.g., elk), but would reduce the overall habitat diversity that supports a greater variety of wildlife. Because of less restrictive wildlife protection measures (i.e., lack of timing and spacing restrictions), impacts from lands and realty management, minerals management (including oil and gas development), and transportation and access management would increase. This would result in disturbance and loss of habitat, and displacement, energy loss, and increased mortality of big game and other wildlife species. The actions proposed in this alternative would result in a loss of the values that would qualify the Cow Butte/Wild Cow Area as a WHMA.

4.13.17.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, forestry, paleontology, other SD/MAs excluding the Historic Trails ACEC, VRM, and wild horse management actions would have little or no impact on the Cow Butte/Wild Cow Potential WHMA.

Impacts on the Cow Butte/Wild Cow Potential WHMA from fire and fuels, lands and realty, minerals, OHV, recreation, and transportation and access management would be the same as those under Alternative 1.

Cultural resource management actions would increase protections to the vegetation and wildlife values for which the WHMA is designated under this alternative. Prohibiting surface disturbing activities within 1/4 mile of historic properties where the setting contributes to the NRHP eligibility would eliminate all surface disturbance–related impacts on the vegetation communities and associated wildlife habitat where the two resources overlap. There would potentially be impacts to the vegetation communities when developments are relocated for cultural concerns into critical wildlife habitat.

Livestock management actions would provide for all fences to be modified to meet BLM standards, which would greatly reduce stress, energy loss, change in animal distribution, and death or injury from entanglement to big game species. Conversion of all fences for easier wildlife passage would make controlling livestock more problematic. Fence locations that receive more pressure from livestock, such as drainage crossings, fence corners, and locations close to water sources, would require more maintenance but would still likely not hold livestock from crossing over. In areas where fences receive less pressure, standard BLM fences would adequately control livestock movement.

Prohibiting the grazing of domestic bison on blocked public lands would affect the entire WHMA. The need for stronger fences to control bison movement would not exist; therefore, greater barriers to big game movement would not exist. This area is used extensively by the public, so prohibiting bison from this area would reduce the potential of incidents between bison and humans.

Cow Butte/Wild Cow WHMA management would include the following restrictions. The WHMA would be an avoidance area for utility/transportation systems and wind energy development. This would limit, but not preclude, placement of these facilities, which would potentially result in trampling, disturbance, or loss of wildlife habitat. It also might displace, disturb, or cause stress, energy loss, injury, or mortality to wildlife. Closure to new federal oil and gas leasing, locatable mineral entry and mineral material disposals, as well as pursuing withdrawals from locatable mineral entry, would add further protections against the potential loss or disturbance of wildlife habitat and/or the displacement and other impacts to big game which use this habitat.

The only developed and maintained roads within the Cow Butte/Wild Cow Potential WHMA are BLM and county roads. Restricting the road density to current levels would limit the ability to develop the WHMA for oil and gas development. To maintain current road densities, unimproved (two-track) roads on public lands would need to be closed. The current number of roads within the area would not be enough to adequately develop this area at 8 well locations per section. Therefore, little reduction in surface disturbance from new road construction would be realized.

Surface disturbance would be restricted or prohibited within mountain shrub and aspen plant communities which provide important wildlife seasonal and crucial winter range habitats. However, there would still be a loss of habitat effectiveness, creating stress to wildlife from operational aspects of CBNG development. Wildlife habitat loss and fragmentation would be minimized, resulting in enhanced vegetation and wildlife resources, thus maintaining the values of the WHMA.

Vehicle travel for “necessary tasks” would be prohibited, which would result in reduced wildlife stress and displacement, particularly to elk, mule deer, and Columbian sharp-tailed grouse. Activities like fence maintenance would require additional time and expense to complete. People who participate in non-motorized activities would continue to use the area, but those who prefer to use vehicles may be displaced to other areas. Motorized vehicles would be limited to using designated roads, with seasonal closures potentially restricting vehicle use only to portions of the year, in order to protect wildlife habitat and populations during critical periods.

New fence construction would not be allowed, which would eliminate potential additional affects to wildlife including increased stress, energy loss, injury, and mortality.

The Cow Butte/Wild Cow Potential WHMA overlaps the Historic Trails Potential ACEC along its western and southern boundaries. Surface disturbances and facilities would be moved to locations outside the Historic Trails Potential ACEC, eliminating the potential for disturbances to the vegetation communities where the two resources overlap.

Impacts from vegetation management would be similar to Alternative 1. The exception is that there would be greater emphasis to obtain mosaic patterns of treatment and an increase in weed treatments. There would be an emphasis on noxious and invasive weeds that would increase forage production and diversity and minimize proliferation of weeds into native plant communities. Emphasis would be placed on achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). This priority would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are maintained and/or enhanced. Vegetation treatments in mature and decadent vegetation communities would result in an improved mosaic of early-, mid-, and late-seral conditions that would achieve objectives for the area. Decadent shrub communities usually lack the understory herbaceous species that make up early-and mid-season forage for many species. Mature communities may still provide the thermal cover necessary in harsh winters. Creation of an adequate mosaic of age classes provides the mix of forage and cover appropriate for maintenance and survival of elk and mule deer.

Impacts from water quality, watershed and soils management actions would be similar to those under Alternative 1. The exception is surface discharge of produced water would be prohibited from federal leases. This would protect the WHMA from erosion and channel modification in response to changes in surface hydrology. There would be less potential for surface water flow regimes to influence drainage channels and riparian habitat, maintaining soil stability for continued vegetation growth. Water impoundments in the Muddy Creek Watershed (Map 2-20) that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed, which would maintain existing hydrologic flow patterns, and in specific locations, the fish populations that have evolved with them. Creation of large water reservoirs capable of supporting new sport fishing populations and providing water to wildlife and livestock during drought periods would likely not occur in this area.

Impacts on the Cow Butte/Wild Cow Potential WHMA from wildlife management would be similar to under Alternative 1. The exception is that more restrictive management actions to protect wildlife habitat (e.g., increasing buffer zones around greater sage-grouse and Columbian sharp-tailed grouse leks, greater seasonal restrictions and prohibitions on surface disturbing and disruptive activities) would provide a greater benefit to big game, raptor, and sage grouse species and their associated habitats.

Summary

Under this alternative, Cow Butte/Wild Cow would be managed as a WHMA. Crucial habitat for elk and mule deer would be afforded the greatest protection because of restrictions on surface disturbing activities. The portion of this management area which overlaps with the Grizzly allotment would be guided by the existing MOU between the BLM and WGFD, along with additional coordination and consultation, to protect and enhance wildlife and fisheries habitat.

Road densities would remain at current levels, but with two-track roads closed and reclaimed to reduce habitat fragmentation as new improved roads are developed for minerals activities. The WHMA would be an avoidance area for utility/transportation systems and wind energy development. Closure to new federal oil and gas leasing, locatable mineral entry and mineral material disposals, as well as pursuing withdrawals from locatable mineral entry would add further protections against the potential loss or

disturbance of wildlife habitat and/or the displacement and other impacts to big game which use this habitat. Vehicle travel for "necessary tasks" would be prohibited, which would result in reduced wildlife stress and displacement. Motorized vehicles would be limited to using designated roads, with seasonal closures potentially restricting vehicle use to portions of the year to protect wildlife habitat and populations during critical periods. New fence construction would not be allowed. All existing fences would be modified to BLM standards to minimize the negative affects fences have on wildlife. Aspen and mountain shrub plant communities would be protected or would have restricted disturbance. Further, vegetation treatments would achieve DPC objectives for both vegetation health and to enhance wildlife habitat and populations.

Surface disturbing activities resulting from lands and realty and minerals management would degrade portions of the vegetation communities. Wildlife displacement would also occur because of the continued human presence associated with CBNG development. The continued human presence associated with development would result in a loss of function to large areas of the critical habitat. Intensive management of these activities would help reduce, but would not eliminate, these impacts. The restrictions on surface disturbing and disruptive activities under this alternative would allow for some loss of the vegetation communities and associated wildlife habitats. This would potentially reduce the number of wildlife species that inhabit the region, rendering it unacceptable as a WHMA.

4.13.17.5 Impacts Under Alternative 4: Proposed Plan

Air quality, forestry, locatable and saleable minerals, paleontology, other SD/MAs excluding the Historic Trails SD/MA, and wild horse management actions would have little or no impact.

Impacts on the Cow Butte/Wild Cow Potential WHMA from fire and fuels, lands and realty, livestock, minerals, OHV, recreation, transportation and access, and water quality, watershed, and soils management would be the same as those under Alternative 1.

Impacts from cultural resource management would be the same as those under Alternative 3.

Cow Butte/Wild Cow WHMA management would include the following restrictions. The WHMA would be an avoidance area for utility/transportation systems and wind energy development. This would limit, but not preclude, placement of these facilities, which would potentially result in trampling, disturbance, or loss of wildlife habitat. It also would displace, disturb, or cause stress, energy loss, injury or mortality to wildlife. Closure to new federal oil and gas leasing and mineral material disposals would add further protections against the potential loss or disturbance of wildlife habitat and/or the displacement and other impacts to big game which use this habitat.

Surface disturbance would be restricted or prohibited within mountain shrub and aspen plant communities which provide important wildlife seasonal and crucial winter range habitats. However, there would still be a loss of habitat effectiveness, creating stress to wildlife from operational aspects of CBNG development. Wildlife habitat loss and fragmentation would be minimized, resulting in enhanced vegetation and wildlife resources, thus maintaining the values of the WHMA.

Motorized vehicles would be limited to using designated roads, with seasonal closures potentially restricting vehicle use to portions of the year to protect wildlife habitat and populations during critical periods.

Impacts from vegetation management would be similar to impacts under Alternative 3. The exception is more treatments for noxious and invasive species would be conducted, which would improve big game crucial winter range. Vegetation management and treatment actions to achieve DPC would improve

native vegetation communities in terms of forage quality and diversity of species, cover, and age-class structure.

Impacts from wildlife management would be similar to those under Alternative 1. The exception is that more protective stipulations, in the form of longer timing restrictions, would be required for greater sage-grouse, sharp-tailed grouse, and raptors. The longer restrictions would better reflect breeding and nesting periods. They also would reduce potential disturbance and habitat loss and increase reproductive success of grouse within the WHMA. Raptor timing restrictions would also be altered to better reflect individual species' requirements, which would increase protection for raptors during critical periods.

Summary

Under this alternative, Cow Butte/Wild Cow would be managed as a WHMA and surface disturbing and disruptive activities would be restricted and managed to protect wildlife habitat conditions. The portion of this management area which overlaps with the Grizzly allotment would be guided by the existing MOU between the BLM and WGFD, along with additional coordination and consultation, to protect and enhance wildlife and fisheries habitat.

The WHMA would be an avoidance area for utility/transportation systems and wind energy development. Closure to new federal oil and gas leasing and mineral material disposals would add further protections against the potential loss or disturbance of wildlife habitat and/or the displacement and other impacts to big game which use this habitat. Motorized vehicles would be limited to using designated roads, with seasonal closures potentially restricting vehicle use to portions of the year to protect wildlife habitat and populations during critical periods. Aspen and mountain shrub plant communities would have restricted disturbance, and vegetation treatments would achieve DPC objectives for both vegetation health and to enhance wildlife habitat and populations.

Surface disturbing activities resulting from lands and realty and minerals management would degrade portions of the vegetation communities. Wildlife displacement would also occur because of the continued human presence associated with CBNG development. The continued human presence associated with development would result in a loss of function to large areas of the critical habitat. Intensive management of these activities would help reduce, but would not eliminate, these impacts. The restrictions on surface disturbing and disruptive activities under this alternative would allow for some loss of the vegetation communities and associated wildlife habitats. This would potentially reduce the number of wildlife species that inhabit the region, rendering it unacceptable as a WHMA.

4.13.18 White-Tailed Prairie Dog Potential ACEC

4.13.18.1 Impacts Common to All Alternatives

The management actions that are proposed for air quality, forestry, livestock grazing, paleontology, visual resource management, water quality, watershed, soils, and wild horses would have negligible impact on the potential White-Tailed Prairie Dog (WTPD) ACEC areas.

Avoidance of cultural resource sites under the NHPA, where they occur, would provide protection to the potential WTPD ACEC areas from surface disturbing activities where cultural resources and the WTPD habitats overlap.

AMRs for SD/MAs would protect or enhance the relevant and important values of the SD/MAs requiring special management attention. In this instance, the AMR for WTPD habitats would be to maintain or enhance a vegetative mosaic, thereby allowing for maintenance of the prairie dog populations. In areas

where wildland fire suppression activities would maintain intact stands of sagebrush or greasewood, there would continue to be no habitat for white-tailed prairie dogs. Removal of dense stands of brush by wildland fire and fuels treatments would potentially increase prairie dog habitat, which could result in localized expansion into new habitat and an increase in WTPD numbers.

Where existing withdrawals that restrict surface disturbance overlap with prairie dog towns, there would be increased protection for WTPDs and their habitat. Where existing withdrawals are reopened for surface disturbance and disruption, there would be reduced protection for the prairie dogs. Management actions would be designed to minimize conflicts with adjacent landowners and enhance the natural resource values of the area to meet management objectives. However, the checkerboard land ownership reduces BLM's ability to effectively manage for wildlife habitat. Surface disturbing activities located on private lands are not subject to the same restrictions and stipulations for preservation of wildlife habitat. These actions might have impacts that carry over to the adjacent BLM lands and reduce the quality of wildlife habitat and forage.

Surface disturbing activities associated with authorized minerals actions have the potential to displace WTPDs, and fragment and degrade WTPD habitat, specifically short grass, saltbush steppe, and low sagebrush-grass communities. White-tailed prairie dogs are more tolerant of visual obstructions than black-tailed prairie dogs, but do prefer areas with few visual obstructions (Feldhamer et al. 2003), and therefore often recolonize areas of disturbance when the area again becomes suitable. Prairie dogs will often create new burrows and/or towns in previously disturbed areas such as pipeline corridors, well sites, and access roads. WTPDs hibernate during the winter months, emerging as early as February in some years, depending on the weather. During the winter months, surface disturbing activities in close proximity to prairie dog towns that would cause burrows to collapse could result in direct mortality of hibernating individuals.

The impacts of recreation management on potential WTPD ACEC areas would include direct mortality from recreational shooting, disturbance and increased stress from OHV use near prairie dog towns, and general disturbance from human activity in proximity to the prairie dog towns.

There is no overlap between most of the SD/MAs and the potential WTPD ACEC areas. The notable exception is the Shamrock Hills ACEC. This is a WHMA designed to protect the concentration of breeding and nesting ferruginous hawks as well as other bird species. It is implied that part of the protection for the hawks would include protection of their prey base. A portion of their prey base is made up of WTPDs. Therefore, the continued implementation of the Shamrock Hills ACEC or RCA could have the complementary effect of protection of the Shamrock Hills portion of the potential WTPD ACEC. However, there would also be the effect of increased predation of prairie dogs in the area. It is not clear how this would impact the local populations or the viability of the prairie dogs. However, it is reasonable to suspect that management of the Shamrock Hills ACEC would not lead to a population of raptors above what could be sustained by the local prey base, and that therefore natural predator/prey interactions would be expected.

New transportation and access routes would have the potential to displace prairie dogs from the immediate vicinity of any new disturbance or construction. Where roads are closed and reclaimed, there would be potential habitat for expansion and dispersal of prairie dog towns in adjacent areas.

The maintenance, reclamation, and restoration of native and diverse plant communities from vegetation management, water quality, watershed, and soils management would maintain and enhance the prairie dog habitat within the potential WTPD ACEC areas. Management to meet the Wyoming Standards and Guidelines for Healthy Rangelands would provide for the maintenance of WTPD populations and habitat.

4.13.18.2 Impacts Under Alternative 1: Continuation of Existing Management

Impacts from fire and fuels management activities would be the same as under Impacts Common to All Alternatives.

The area would not be managed as an ACEC. In relation to prairie dog management, this would mean that the area would continue to be open to locatable mineral entry, and mineral material disposal. Prairie dog poisoning would continue to be allowed in accordance with existing local annual predator damage management plans. Prairie dogs would continue to receive protection as a BLM sensitive species (6840 manual). Prairie dog towns would continue to be avoided during surface disturbing activities. Seismic activities would continue to be restricted. Motorized vehicle use would continue to be limited to existing roads and vehicle routes. The combination of these management actions would continue to ensure that the habitat needs of the prairie dog would be met. No significant adverse impacts would occur to the species.

Impacts to potential WTPD ACEC areas from lands and realty management would occur from linear features and other permitted facilities. While surface disturbing and disruptive activities would be avoided within prairie dog towns, construction of aboveground facilities would be allowed adjacent to white-tailed prairie dog towns. These facilities can create perches for raptors and increase predation of WTPDs. Additional impacts would include habitat loss and temporary displacement of prairie dogs from preferred habitats. Areas with sensitive resource values, such as white-tailed prairie dog towns, would be avoided for placement of wind energy development, utility/transportation corridor development, and communication sites. Where avoidance is not possible, the areas would be intensively managed. This would have the impact of reducing disturbance and disruption to the prairie dog towns.

Impacts to potential WTPD ACEC areas from minerals management would occur where locatable mineral activities (about 25 acres/year), mineral material excavation (negligible acreage), and well site activities (about 61,895 acres) would overlap with prairie dog towns. These impacts would include direct mortality, displacement, disturbance of behavior, removal of vegetation, destruction of burrows, and construction of aboveground facilities that could lead to increased predation. However, these potential adverse impacts would be mitigated with the use of intensive management, avoidance where possible, BMPs, as well as other potential mitigation measures as determined on a case-by-case basis.

Motorized vehicle use would be limited to existing roads and vehicle routes. This limitation would reduce disturbance and disruption to the prairie dog towns.

Impacts on the potential WTPD ACEC areas from other wildlife management actions are highly variable. The following paragraphs describe those potential impacts.

Many aspects of raptor management under this alternative would be beneficial to the potential WTPD areas. For instance, the management goal “to restore habitat to conserve, recover and maintain populations of sensitive species” such as raptors implies the following protection for prairie dogs. Prairie dogs are a prey item for a number of raptor species, and therefore enhancement of prairie dog habitat, which increases the numbers of prairie dogs, increases foraging opportunities for various raptor species. Prairie dog towns are also an important habitat component for burrowing owls. Burrowing owls use prairie dog burrows as nesting sites. Protection and enhancement of prairie dog towns would also enhance burrowing owl habitat. Timing stipulations and surface occupancy restrictions, as well as intensive management of surface disturbing and disruptive activities in areas associated with raptor nests, would reduce stress to WTPDs during certain times of the year. In areas where restrictions designed to protect raptors overlap with prairie dog towns, there would be complementary protection of prairie dog towns.

Big game habitat management would result in protection of prairie dog habitat where identified big game crucial winter ranges overlap with the WTPD ACEC areas. The timing stipulations associated with big game crucial winter range extend from November 15 to April 30 and preclude surface disturbing and disruptive activities. This would help alleviate the potential collapse of burrow systems caused by surface disturbing and disruptive activities, which could cause mortality of hibernating WTPDs.

Intensive management and the use of BMPs (primarily avoidance and timing restrictions) for wildlife would be applied to all surface disturbing and disruptive activities in areas subject to oil and gas development. Avoidance of WTPD towns and complexes would reduce the overall loss of preferred habitat, reduce stress to WTPDs, move facilities suitable as raptor perches away from WTPD towns, and avoid direct loss of prairie dogs to vehicles and oil and gas equipment.

The management goal to manage for quality habitat to support the introduction, re-establishment, augmentation, transplant, stocking, and expansion of identified high-priority fish and wildlife species, in consultation and coordination with appropriate local, state, and federal agencies and adjacent landowners implies that proper prairie dog management would include the consideration of future reestablishments of black-footed ferrets. Further, black-footed ferret management indicates that if prairie dog towns/complexes, suitable as black-footed ferret habitat are present, attempts would be made to avoid locating surface disturbing activities within towns/complexes, or a black-footed ferret survey would be required. This would have the effect of protecting prairie dog towns in which a black-footed ferret is found, and protect towns in which a proponent wishes to forego an action because of the requirement to conduct a ferret survey.

WTPDs are currently a Wyoming BLM-sensitive species. The management goal to restore habitat to conserve, recover and maintain populations of sensitive species would be applied to prairie dogs. Further, surface disturbing and disruptive activities would be avoided in prairie dog towns. In addition, for the management of this sensitive species, power poles within prairie dog towns would be equipped with raptor anti-perch devices. The combined impacts of these management actions would be to reduce disturbance and disruption of existing prairie dog towns. However, there is also the allowance of poisoning without associated restrictions for consideration of human health and safety, which would allow for direct mortality of the prairie dogs.

Surface occupancy and timing restrictions, associated with greater sage-grouse and sharp-tailed grouse leks, nesting and early brood rearing habitats, and winter concentration habitats, provide protection to sensitive greater sage-grouse and sharp-tailed grouse habitats. Where these areas overlap with the potential WTPD ACEC areas, there would be complementary protection, similar to those mentioned above for raptors and big game crucial winter range, for the associated prairie dog towns.

Under this alternative, application of BMPs to all surface disturbing and disruptive activities within migratory and upland game bird habitat would have the complementary effect of wise use in areas where bird habitats overlap with the potential WTPD ACEC.

Summary

Prairie dogs are recognized as a keystone species. As such, many other animals use prairie dog towns for some aspect of their life histories. It has been documented that prairie dog towns exhibit enhanced biodiversity over surrounding habitat types. Under this alternative, activities permitted in the area could result in potential disturbance and destruction of habitat and displacement of prairie dogs. However, intensive management and continuation of existing management practices would meet the needs of the WTPD populations and protect their various complexes by attempting to relocate activities outside of white-tailed prairie dog towns.

4.13.18.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from fire and fuels management activities would be the same as under Impacts Common to All Alternatives.

Impacts from lands and realty and minerals management would be the same as those identified in Alternative 1. However, decreased restrictions from wildlife management actions, including allowance of surface disturbing activities in prairie dog towns and complexes and increased numbers of structures, would result in additional loss of habitat and potential predation.

The impacts from minerals management to the potential WTPD ACEC would be the same as under Alternative 1. However, the impacts would be allowed in more areas of the RMPPA and with less restriction.

The impacts from motorized vehicle use would be the same as in Alternative 1.

The impact from not designating the potential WTPD ACEC area as an ACEC would be the same as those Alternative 1.

Under this Alternative 2, there would be greatly reduced amounts of protection for the proposed WTPD ACEC areas. Well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence would be allowed in close proximity (less than 825 ft) to raptor nests. Further, the timing restriction buffer would be reduced to only 1/2 mile around the nests. Moreover, the "intensive management" standard for RCAs would be removed. No raptor anti-perch devices would be required in proximity to prairie dog towns. There would be no restriction of high-profile structures in relation to prairie dog towns. Crucial winter range and parturition area timing stipulations for big game, and breeding, nesting, and winter habitat for greater sage grouse, would be removed. Under this alternative there would be no "intensive management" requirement for BLM-sensitive species, including WTPDs, and there would be no requisite to "avoid" surface disturbance and disruption of prairie dog towns. Also under this alternative, there would be no requirement during animal damage control efforts to limit those actions to areas where there is a demonstrated threat to human health or safety. Where these areas overlap with the WTPD ACEC areas, there would be reduced protection for prairie dogs that would lead to direct mortality of prairie dogs, a loss of preferred habitat, and a potential increase in predation associated with an increase in oil and gas facilities, used as raptor perches, in close proximity to, or within, WTPD towns and complexes.

Summary

The removal of wildlife distance and timing restrictions would degrade WTPD habitat and increase predation against and stress for WTPDs. This alternative would not meet the needs of the WTPDs. In areas of high and moderate oil and gas development, there is greater potential for local populations of prairie dogs to decline or be extirpated. Decreases in overall abundance and distribution of the prairie dogs are likely and would take decades to reestablish. Prairie dog habitat would decline, which would have adverse impacts on other wildlife species that use WTPD towns and complexes as habitat.

4.13.18.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from fire and fuels management activities would be the same as under Impacts Common to All Alternatives.

This alternative would reduce the impacts to the potential WTPD ACEC areas from lands and realty management. Above-ground facilities would not be allowed within 1/4-mi of a prairie dog town, unless they are equipped with anti-raptor perching devices. The potential WTPD ACEC areas would be closed to further development of utility/transportation systems, wind energy, and communication sites. This would alleviate the surface disturbance associated with these types of development and the displacement of prairie dogs. However, the degree to which disturbance has an effect on WTPDs is unclear. It has been observed that prairie dogs will readily re-colonize areas of disturbance because of their affinity for open spaces and improved predator detection.

The impacts to the potential WTPD ACEC areas from minerals management would be the same as discussed in other alternatives, but notably reduced under this alternative. This is because the acreage that would be developed is more restrictive in both the amount of acreage and associated stipulations.

The protections to WTPD ACEC areas that would be provided in association with an ACEC designation include a buffer of 50 meters (164 ft) for all prairie dog towns in which there would be no surface disturbing or disruptive activities. These lands would be closed to locatable mineral entry and mineral material disposal. Closure of specific roads would be considered on a case-by-case basis to meet the objectives of the ACEC. No above-ground facilities would be allowed within 1/4 mile of a prairie dog town unless the facilities were equipped with raptor anti-perching devices. Acquisition of adjacent lands would be pursued to facilitate protection of the species. Finally, prairie dog poisoning would not be allowed except in circumstances of demonstrated threats to human health and safety. The combined effects of this management would be to protect WTPDs above and beyond what is necessary, given the current status of the species as well as the ecological aspects of WTPD life history that allow the species to adapt and thrive in areas of disturbance.

Management actions associated with wildlife management (i.e., intensive management of surface disturbing activities) would provide protection to WTPD towns and complexes. This alternative would place restrictions on the placement of above-ground facilities and high-profile structures. BMPs would restrict surface disturbing and disruptive activities for big game and prairie grouse crucial winter ranges. BMPs would also entail seasonal restrictions for nesting and breeding grouse and raptors. In addition, protection would be afforded through timing restrictions in crucial winter range, nesting and breeding prairie grouse habitat, grouse leks, and nesting raptor species. Prairie dog poisoning by Animal and Plant Health Inspection Service (APHIS) would be restricted, and could benefit the viability of the species.

Summary

This alternative provides the most protection for all wildlife, including WTPDs. Surface disturbing and disruptive activities would be prohibited within WTPD towns or complexes. The management under this alternative would exceed the needs of WTPD populations and their habitat.

4.13.18.5 Impacts Under Alternative 4: Proposed Plan

Impacts from fire and fuels management activities would be the same as under Impacts Common to All Alternatives.

The impacts from lands and realty management to the potential WTPD ACEC areas would be the same as under Alternative 1.

The impacts from minerals management to the potential WTPD ACEC areas would be the same as under Alternative 1. However, slightly less area would be open to surface disturbance and disruption from mineral management practices.

The impacts from OHV management to the potential WTPD ACEC would be the same as under Alternative 1.

Impacts to the WTPD ACEC areas would be similar to under Alternatives 1 and 3. WTPDs would receive the same protections from overlapping big game crucial winter ranges, big game parturition areas, raptor concentration areas, raptor nest buffers, and sage grouse lek buffers, potential black-footed ferret habitat, and other BLM-sensitive species management as in Alternative 1. Prairie dogs would receive protections from overlapping big game migration corridors, allowance of poisoning in prairie dog towns would only be allowed when there is a demonstrated threat to human health or safety, and sage grouse winter concentration areas as are given in Alternative 3. The potential WTPD ACEC areas would not be designated as an ACEC. Further, this alternative offers unique protection by implementing "avoidance" of placing power poles within prairie dog towns, and requiring raptor anti-perch devices in the event this action cannot be avoided.

Summary

Alternative 4 would provide greater protection to WTPDs and their associated habitat than Alternative 1. The WTPD ACEC areas would not be designated as an ACEC. Intensive management and continuation of existing management practices would fulfill the needs of WTPD populations and would meet multiple-use objectives.

4.13.19 High Savery Dam Potential ACEC

4.13.19.1 Impacts Common to All Alternatives

This area would be cooperatively managed for multiple-use (e.g., recreation, irrigation water, and development of a CRCT fishery), consistent with the June 2003 MOU between the Wyoming Water Development Commission (WWDC) and BLM (Appendix 23). Air quality, cultural resources, forestry, minerals, paleontology, SD/MAs (except the High Savery Dam Potential WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the High Savery Dam Potential WHMA.

Management actions would be designed to enhance the natural resource values of the area to meet management objectives. However, the small amount of federal land within the High Savery Dam Potential WHMA reduces BLM's ability to effectively manage for watershed values and wildlife habitat. Surface disturbing activities located on state and private lands are not subject to BLM protective measures. These activities would reduce the ability to achieve management objectives.

Fire and fuels management actions would result in the suppression of all wildfires due to recreational infrastructure and public safety. Although construction of fire lines, operation of heavy equipment, and firefighter presence would temporarily displace wildlife species within the area, fire and fuels management actions would protect facilities, the public, and watershed and wildlife habitat values through the control of wildland fires.

The lands and realty program would have minimal impact on fish and wildlife resources, as a result of the lack of development anticipated in this area. Land tenure adjustments, including acquisition, easements, or exchange, are not anticipated to occur to a great extent within this WHMA. This is because the WWDC owns or controls all of the nonfederal surface lands. Therefore, there would be minimal effects on recreation, watershed, or fish and wildlife values.

Livestock management actions would adhere to the MOU and would be required to meet the Standards for Healthy Rangelands (USDI, BLM 1997). This would assure that forage use by all grazing animals would not result in impairment of soil, vegetation, or water resources. Livestock grazing would result in direct competition for forage, water, and space with wildlife. Wildlife would also be temporarily displaced during maintenance of existing range improvements. Livestock grazing would reduce the overall availability of forage, primarily grass and forbs, for wildlife species, but would in some cases increase forage palatability for big game species. Livestock grazing of grasses would also reduce fuel loads, potentially leading to smaller, less severe wildfires.

Recreation management activities such as boating, camping, fishing, hunting, hiking, and sightseeing that result in increased human presence would have a moderate, localized impact on wildlife and fish species. Human disturbance of wildlife results in increased energy costs to the alerted animal and can result in reduced animal fitness and reproductive potential (Geist 1978). However, restricting motorized vehicles to the road and facilities on the north side of the reservoir and promoting walking access to the majority of the WHMA would reduce human disturbance. Reduced motorized traffic and OHV use would minimize surface disturbance in sensitive areas (riparian habitat) and also reduce stress and energy loss by big game species and other wildlife.

High Savery Dam Potential WHMA management is guided by the existing MOU between the BLM and WWDC, along with additional coordination and consultation, to protect and enhance the values for which this WHMA was established. Actions to maintain or enhance riparian and instream habitat would stress development of a CRCT sport fishery. In addition, the High Savery Reservoir would be managed as a supplemental brood source for the CRCT to expand stocking efforts of this species to other locations. These management actions would coincide with the Conservation Agreement and Conservation Strategy for the Colorado River Cutthroat Trout (CRCT Task Force 2006).

Vegetation management and treatment actions would be designed and implemented to achieve Standards for Healthy Rangelands (USDI, BLM 1997) in terms of forage quality and diversity of species, cover and age-class structure. This would benefit fish, wildlife, and their associated habitat.

Water Quality, Watershed, and Soils Management actions would avoid surface disturbance near water resources, wetlands, steep slopes, and sensitive soils. These management actions would limit surface disturbance in such areas to projects that cannot avoid them and that require mitigation and BMPs (Appendix 13) to address the resource values of the area. Management of surface disturbance above 303(d) listed stream segments such as Savery Creek (Appendix 11) would change the design or location of projects to protect water quality.

Maintenance or enhancement of wildlife habitat within the WHMA, in coordination with the WGFD, USFWS, and other agencies, would benefit wildlife species by improving vegetation species composition, age class, structure, and cover. Conservation measures for T&E species, proposed and candidate species, sensitive species, and other wildlife would be implemented to promote sound management to conserve and preserve the species and their associated habitat, comply with Section 9 of ESA, and promote recovery as identified in the provisions of the ESA and BLM-sensitive species policies. Impacts to threatened, endangered, proposed, and candidate species have been analyzed in the Biological Assessment (USDI, BLM 2007a).

4.13.19.2 Impacts Under Alternative 1: High Savery Dam Potential WHMA (Continuation of Existing Management)

Air quality, cultural resources, forestry, minerals, paleontology, SD/MAs (except the High Savery Dam Potential WHMA), transportation and access, visual resource management, and wild horses would have little or no impact on the High Savery Dam Potential WHMA.

Impacts from fire and fuels, lands and realty, recreation, the High Savery Dam Potential WHMA, and water quality, watershed, and soils management actions to the High Savery Dam Potential WHMA would be the same as described in Common to All. The exception is that avoiding placement of utility/transportation systems and wind energy facilities would also protect wildlife habitat and populations.

OHV management would result in minimal impacts to the High Savery Dam WHMA because of the existing restrictions on OHV use within the WHMA.

The development of livestock grazing systems and new, or modification of existing, range improvements would comply with WHMA objectives. These provide for the enhancement or maintenance of riparian and upland habitat for fish and wildlife in the High Savery Dam Potential WHMA. Duration and timing of livestock use would be coordinated to achieve vegetation objectives while minimizing effects on recreation and associated facilities. Removal of fences that are not necessary for livestock control would reduce barriers to movement and stress in wildlife that use the WHMA. In the immediate vicinity of any new water developments, livestock use would reduce available forage for wildlife and shift livestock use from adjacent locations.

Vegetation management would improve the health and function of native plant communities through reclamation of surface disturbing activities, the use of natural fire and management prescriptions (e.g., burning, plantings, seedings, and chemical, mechanical, biological, and grazing treatments). This would increase the diversity of forage, cover, and structure of wildlife habitat to benefit all wildlife species.

Mitigation measures applied to all permitted actions would reduce disturbance to wildlife species, including big game, greater sage-grouse, and raptors during critical periods and within specified distances of wildlife habitat, which would protect values for which the WHMA was established.

Summary

Under this alternative, High Savery Dam would be managed as a WHMA with an emphasis on fisheries (particularly CRCT) and recreation. Surface disturbing and disruptive activities would be restricted and managed to protect recreation, watershed values, and fish and wildlife habitat and populations. Livestock and vegetation management would be guided by the existing MOU between the BLM and WWDC, along with additional coordination and consultation. Avoiding placement of utility/transportation systems and wind energy facilities would also protect fish and wildlife habitat and populations.

4.13.19.3 Impacts Under Alternative 2: High Savery Dam Potential WHMA (Emphasis on Development of Resources)

Air quality, cultural resources, forestry, minerals, paleontology, SD/MAs (except the High Savery Dam Potential WHMA), transportation and access, visual resource management, and wild horse management would have little or no impact on the High Savery Dam Potential WHMA.

Impacts from fire and fuels, lands and realty, livestock, OHV, recreation, and High Savery Dam Potential WHMA, and water quality, watersheds and soils management would be the same as under Alternative 1.

The impacts from vegetation management actions would be similar to Alternative 1. The exception is the increase in vegetation treatments would increase grass and forb composition and minimize proliferation of weed species into native plant communities. Decadent aspen communities would be stimulated through the application of prescribed burns, resulting in an increase in stem density, younger age-class structure, and expanded size of stands. This would improve habitat conditions for wildlife that use aspen woodland habitat. Watershed values and forage for winter elk use would be improved; however, hiding and shrub cover used by mule deer would be decreased.

Mitigation measures implemented under the wildlife management program for all permitted actions would be reduced. This would potentially increase disturbance to wildlife species, including big game, greater sage-grouse and raptors during critical periods and within buffers of wildlife habitat.

Summary

Under this alternative, High Savery Dam would be managed as a WHMA with an emphasis on fisheries (particularly CRCT) and recreation. Surface disturbing and disruptive activities would have reduced restrictions that would increase the potential for degradation of vegetation, soils and watershed values, human-induced stress to wildlife species, and lowering the value of the recreational experience. Livestock and vegetation management would be guided by the existing MOU between the BLM and WWDC, along with additional coordination and consultation. Increased vegetation and weed treatments would maintain and/or enhance watershed values as well as forage and habitat for wildlife that prefer early succession plant communities. Avoiding placement of utility/transportation systems and wind energy facilities would also protect fish and wildlife habitat and populations.

4.13.19.4 Impacts Under Alternative 3: High Savery Dam Potential Area of Critical Environment Concern (Emphasis on Protection of Resources)

Air quality, cultural resources, forestry, minerals, paleontology, SD/MAs (except the High Savery Dam Potential ACEC), transportation and access, visual resource management, and wild horse management would have little or no impact on the High Savery Dam Potential ACEC.

Impacts from lands and realty, OHV, recreation, and water quality, watersheds and soils management would be the same as under Alternative 1.

Impacts from fire and fuels management would be similar to impacts under Alternative 1, except opportunities to manage wildfires for resource benefit would be considered.

Impacts from livestock management would be similar to impacts under Alternative 1, with the exception that management would achieve DPC in addition to meeting the Standards for Healthy Rangelands (USDI, BLM 1997), which would result in enhanced values for fish and wildlife habitat and/or recreation.

This High Savery Dam Potential ACEC management actions would enhance the relevant and important values for which it was proposed and ACEC. Closure to future land disposal actions would retain public acreage and result in the elimination of future disturbance that would compromise the integrity of the Potential ACEC. There would be no impacts from lands and realty management because the area would be withdrawn from operation of public land laws and placement of utility/transportation systems and wind energy facilities would be excluded, which would further reduce the potential for surface disturbing and disruptive activities. These actions would collectively protect wildlife habitat and the quality of the

recreation experience. Closure to locatable mineral entry and mineral material disposals, as well as pursuing withdrawals from locatable mineral entry would add further protections against the potential loss or disturbance of fish and wildlife habitat.

Impacts from vegetation management would be similar to Alternative 1, except there would be emphasis on smaller, mosaic patterns of treatment that would improve habitat conditions. Use of natural fire ignitions to improve resource values would be limited because of land ownership and management objectives for recreation and watershed.

Wildlife management mitigation measures applied to all permitted actions would restore, improve, and enhance habitat conditions for big game species through increased restrictions. Such restrictions to surface disturbing activities would protect and minimize disturbance to vegetation, soils, and watershed values; however, these benefits are limited because of the small amount of public land contained with the ACEC.

Summary

Under this alternative, High Savery Dam would be designated as an ACEC. Management actions from resource programs would enhance the relevant and important values of the High Savery Dam ACEC. Enhancement of habitat supporting CRCT populations would be the focus of fish and wildlife management. This designation would provide additional protection to riparian habitat, and eliminate potential lands and realty management actions that would detract from the natural resources of this area and recreational experience of visitors. Livestock management would be guided by the existing MOU between the BLM and WWDC along with additional coordination and consultation. This alternative would afford the greatest protection of watershed values and fish and wildlife habitat because of restrictions on surface disturbing activities that would reduce the potential for erosion and watershed degradation. Closing the area to locatable mineral entry and mineral material sales, would reduce the potential for forage loss and stress to elk and mule deer populations from disturbance activities. Excluding placement of utility/transportation systems and wind energy facilities would also protect fish and wildlife habitat and populations.

4.13.19.5 Impacts Under Alternative 4: High Savery Dam Potential WHMA (Proposed Plan)

Air quality, cultural resources, forestry, minerals, paleontology, SD/MAs (except the High Savery Dam Potential WHMA), transportation and access, visual resource management, water quality, watersheds and soils management, and wild horses would have little or no impact on the High Savery Dam Potential WHMA.

Impacts from lands and realty, OHV and recreation management would be the same as described in Alternative 1.

Impacts from fire and fuels, livestock, and vegetation management actions would be the same as described in Alternative 3.

High Savery Dam Potential WHMA management actions would be similar to impacts under Alternative 1. The exception is for the following. Closure to locatable mineral entry and mineral material disposals, as well as pursuing withdrawals from locatable mineral entry would collectively protect wildlife habitat and the quality of the recreation experience.

Wildlife management actions would emphasize achieving DPC for fish and wildlife habitat (Appendix 19 and Appendix 24) to ensure that fish, wildlife, associated habitat, and sensitive life cycles would be protected and/or enhanced. Mitigation measures implemented to all permitted actions during critical periods and within buffers of wildlife habitat would reduce disturbance to wildlife species, including big game, greater sage-grouse and raptors.

Summary

Under this alternative, High Savery Dam would be managed as a WHMA with an emphasis on fisheries (particularly CRCT) and recreation. Surface disturbing and disruptive activities would be restricted and managed to protect recreation, watershed values, and fish and wildlife habitat. Avoiding placement of utility/transportation systems and wind energy facilities would also protect fish and wildlife habitat and populations. Livestock and vegetation management would be guided by the existing MOU between the BLM and WWDC, along with additional coordination and consultation. Vegetation treatments and restrictions on surface disturbing activities would benefit wildlife species and livestock through improved forage production and habitat diversity, reduction in habitat loss, and decreases in human-induced stress.

4.13.20 National Natural Landmarks

4.13.20.1 Impacts Common to All Alternatives

There would be no or negligible impacts under all alternatives on National Natural Landmarks (NNL).

4.13.21 Wild and Scenic Rivers

4.13.21.1 Impacts Common to All Alternatives

Cultural resource management, forestry management, paleontology management, other SD/MAs (excluding those discussed below), and wild horse management would have little or no impact on WSRs, or Wild and Scenic Rivers.

Wind power development near the 1/2-mile-wide waterway segments would detract from the quality of the recreational setting by creating new visual intrusions on the horizon as well as noise that might be audible from the waterways. Marginal to good wind potential near waterway segments in the southern portions of the RMPPA would make wind power generation development unlikely. Cherry Creek, on the north side of the Ferris Mountains, lies in an area of outstanding wind potential where wind development would be more likely.

Management of livestock grazing includes meeting standards for vegetation health, wildlife habitat, and riparian habitat as required by the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997). The improved plant vigor, height, structure, and species composition would contribute to high-quality wildlife habitat and enhance water-related recreation opportunities by maintaining hunting, fishing, and wildlife viewing opportunities along the waterway segments.

Management actions for the North Platte River SRMA to increase river access and disperse river usage would help preserve the user perception of an uncrowded river experience, desired by most visitors. For example, permit timing stipulations on commercial outfitting businesses would reduce crowding at river put-in points during peak public usage on weekends. Stipulations limiting the amount of parking used by commercial outfitters would also alleviate some of the perceived crowding at put-ins.

Transportation and access management efforts to provide additional North Platte River public access points would help disperse recreationists and reduce congestion and the resulting vegetative trampling in heavily used areas.

Vegetation treatments that maintain, enhance, or restore vegetative health and meet the Wyoming Standards for Healthy Rangelands would maintain or improve the quality of recreation. Improved plant vigor, density, diversity, and reduction of noxious and invasive species would improve the aesthetic appeal of treated areas as well as improve the appeal of the recreation settings along eligible waterway segments.

Water Quality, Watershed, and Soils Management actions that improve water quality would improve recreational fishing and floating opportunities. Water and watershed management activities indirectly protect existing flow conditions that affect floaters and fishermen. Surface disturbing activities would be avoided in 100-year flood plains, riparian areas, unstable areas, slopes greater than 25 percent, slumps, and areas exhibiting soil creep. This would limit new disturbance in waterways and help retain water quality and fish habitat, which would protect or improve game fisheries along the eligible waterway segments.

4.13.21.2 Impacts Under Alternative 1: Continuation of Existing Management

In keeping with BLM Manual 8351, .32C and .33 C, suitability determinations would not be made for any of the eligible river segments. They would remain eligible. They would be managed to protect their outstandingly remarkable values, free-flowing nature, and tentative classification to the degree that BLM has authority (BLM lands within the corridor), and within the parameters of decisions made in the RMP, until such time as suitability determinations are made.

Cultural resource, forestry, paleontology, other SD/MAs excluding those discussed below, and wild horse management would have little or no impact on WSRs. Lands and realty management actions would have the same impacts as Impacts Common to All Alternatives.

Livestock grazing systems and range improvements designed to improve livestock management and achieve Wyoming Standards for Healthy Rangelands would potentially improve the recreation experience along eligible waterway segments by reducing livestock congregation and the associated sights, sounds, sedimentation, mud, and pollution along the banks of waterways.

Littlefield Creek, Muddy Creek, and Skull Creek are located within or adjacent to high and moderate oil and gas potential. Mineral development near these creeks would reduce the desirability of recreation settings wherever mineral facilities are visible and potentially audible from the waterways. Mineral development near Littlefield Creek and Muddy Creek would compromise recreational, scenic, fisheries, wildlife, and other outstandingly remarkable values (ORV), if it increased erosion or sedimentation and thereby reduced water quality and aquatic habitat. Mineral development on existing leases within 1/4 mile of Skull Creek would compromise recreational, geologic, scenic, wildlife, and other ORVs, if it created erosion or sedimentation that altered badland topography adjacent to the WSA. Mineral development in proximity to these suitable segments would therefore potentially impair the suitability of the segments for designation as WSRs.

OHV limitations to existing routes in the Upper Muddy Creek/Grizzly WHMA would reduce the amount of erosion, sedimentation, habitat fragmentation, and route proliferation along the eligible waterway segments of Muddy Creek and Littlefield Creek that coincide with the WHMA.

Allowing OHV travel off of existing roads to retrieve big game kills and to access campsites would increase the amount of erosion, sedimentation, habitat fragmentation, and route proliferation along the eligible waterway segments that are classified as scenic or recreational. This would potentially degrade the quality of the ORVs of eligible segments.

An NSO restriction for surface disturbing activities within developed recreation sites in the North Platte River SRMA, including Bennett Peak and Corral Creek, would prevent unplanned and incompatible developments along eligible segments within the most intensively used river in the RMPPA. Surface disturbance would be intensively managed within the 1/4 mile surrounding these sites in an attempt to locate the sights, sounds, traffic, and odors of development far enough away to protect the recreation experience at the sites. These recreation sites would also be closed to locatable mineral entry, mineral material disposals, and operation of the public land laws, all of which further protect the integrity of the sites and the quality of the recreation experience. The sights and sounds of OHVs and ATVs, and other activities, would be a normal part of the recreation experience at these sites. These river sites would not be managed for solitude or silence.

Those WSR segments that lie within WSAs would be protected from alterations to their ORV by the IMP. Approximately 2.4 miles of the Encampment River lie within the Encampment River Canyon WSA. Approximately 31 miles of Skull Creek and its tributaries lie within the Adobe Town WSA. Approximately 1.6 miles of Cherry Creek lies within the Ferris Mountains WSA.

The management prescriptions for WSRs would restrict surface disturbing activities and facility placement that detract from the ORV and tentative classifications of eligible segments.

All suitable waterway segments would be closed to oil and gas leasing and recommended for withdrawal from mineral entry. Suitable waterway segments tentatively classified as scenic would also be closed to operation of the public land laws, including sale, and surface disturbing and disruptive activities. Suitable waterway segments tentatively classified as wild would also be closed to OHV and other motorized use, recreational dredging, development of water impoundments, diversions, or hydroelectric power facilities, commercial timber harvest, and increases in grazing preference within 1/4 mile of the high-water line on each side of the waterway. These actions would prevent the loss of the outstandingly remarkable values that made the segments eligible for WSR designation.

Temporary road and vehicle route closures during and after fire events would displace recreationists to other areas. Burned areas on public lands along the eligible waterway segments would be undesirable places to recreate until after successful reclamation or natural regrowth of riparian vegetation. Displacement would be longer term if catastrophic fires sterilized soils and delayed revegetation along those segments that are popular for river recreation activities. Suitable waterway segments designated an AMR area with emphasis on wildland fire suppression for the protection of vegetation and wildlife habitats would restrict the type of suppression equipment used along segments within WSAs. These restrictions would potentially lead to an increase in acres burned by wildland fires. Burned areas would be subject to accelerated erosion, wildlife displacement, and loss of forage in the short term, which would reduce their desirability as recreation settings. In the long term, recovery of burned areas would result in higher quality wildlife habitat and forage, which would benefit the ORVs.

Transportation and access management would potentially acquire legal public access to increase recreational opportunities within eligible segments tentatively classified as recreational. Road densities would not be considered during the analysis of surface disturbing and disruptive activities adjacent to lands along eligible segments, which would potentially be detrimental to recreation opportunities by allowing road proliferation to fragment habitat, create visual intrusions, create the noise and dust

associated with traffic, create erosion that would add sediment to the river, and generally alter the character of the area.

The long-term effects of vegetative treatments would be to enhance the recreational experience by improving the vegetative health of eligible waterway segments. Treatment of noxious and invasive species would improve wildlife habitat to the benefit of recreationists seeking wildlife viewing opportunities.

Proliferation of noxious and invasive weed species would reduce the quality of wildlife habitat and reduce wildlife presence along the river corridor. It also would directly affect the naturalness of eligible waterway segments. Weed infestations along the Encampment River Trail would detract from the naturalness of the setting along the eligible segment of the Encampment River. Planned treatment acres would not be sufficient to halt the spread of cheatgrass and the resulting degradation of the ORVs, potentially resulting in compromise of WSR suitability.

While BLM treats weeds on public lands at primary river access points such as Bennett Peak and Corral Creek, the majority of lands along the river are State or privately owned, and the landowners would be responsible for appropriate weed treatments. If either BLM or the landowners failed to perform treatments that would control the weed populations, weed infestations would potentially spread.

Class I VRM designations would help protect outstandingly remarkable values along eligible segments within WSAs, including Skull Creek, Encampment River, and upper Cherry Creek. Eligible segments along the North Platte River and Duck Creek would be managed as Class II VRM, which would require mitigation of visual intrusions. The other eligible segments would receive little protection from VRM, but would be protected by the provisions outlined in BLM Manual 8351 to manage eligible segments. This would protect their outstandingly remarkable values, free-flowing nature, and tentative classification, to the degree that BLM has authority (BLM lands within the corridor), and within the parameters of decisions made in the RMP, until such time as suitability determinations are made.

Allowing water-discharges into the North Platte River Basin and Colorado River Basin without a requirement for compliance with specific BLM land use objectives would allow large volumes of surface flow to potentially cause erosion, sedimentation, and turbidity. This would reduce water quality, water clarity, and the quality of the North Platte River fishery, all of which would reduce the quality of ORVs. Fishing is one of the most popular recreational activities in southern Wyoming. Visitors are less likely to return to a fishery if they are repeatedly unsuccessful at catching fish, so the productivity of a fishery is a large determinant of the desirability of a recreation setting for fishermen.

Wildlife and fisheries management decisions affect the habitat, health, and population of wildlife and fish species. Many recreation activities along eligible waterway segments depend on the presence of a healthy and abundant wildlife population, including wildlife viewing, bird watching, and fishing. Seeing wildlife, including big game, waterfowl, game birds, predators, and raptors, is one of the most memorable experiences many visitors have in the North Platte River corridor. Actions to improve habitat, such as meeting Wyoming Standards for Healthy Rangelands (Appendix 8), improve the natural appearance along waterways. For many recreation activities such as photography and wildlife viewing, naturalness is a critical determinant of the desirability of recreation opportunities. Wildlife actions that protect or improve raptor habitat, such as prohibitions against surface disturbing and disruptive activities within specific buffers of nesting raptors, help retain raptors that attract bird watchers to waterways.

Fisheries actions, such as managing fish habitat to achieve PFC, that would maintain or improve fisheries are important to the quality of recreational fishing opportunities. Fishing is one of the most popular

recreational activities in southern Wyoming. All of the developed recreation sites along eligible waterway segments include fishing as a primary activity.

Summary

Mineral development in areas of high and moderate oil and gas potential, such as the Littlefield Creek, Muddy Creek, and Skull Creek areas, where development is expected to occur in proximity to the eligible waterway segments, would potentially impair the eligibility of the segments for designation as WSRs. Vegetation treatments would enhance the recreational experience by improving vegetation health and wildlife habitat, thereby improving the naturalness of eligible waterway segments and the quality of wildlife viewing opportunities adjacent to them. Management prescriptions would prevent degradation of the outstandingly remarkable values along eligible waterway segments until suitability determinations can be made.

4.13.21.3 Impacts Under Alternative 2: Emphasis on Development of Resources

None of the eligible segments would be found suitable for WSR designation. Nor would any of the segments be managed to retain their eligibility for WSR designation. The Encampment River, Cherry Creek (within the Ferris Mountains WSA), and Skull Creek segments would be protected as long as the WSAs are under consideration for wilderness designation. Management actions for other resources would potentially alter conditions along the waterway segments.

Summary

None of the eligible segments would be found suitable for WSR designation.

4.13.21.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Cultural resources, forestry, paleontology, and wild horse management would have little or no impact on WSRs.

Impacts associated with fire and fuels, lands and realty livestock grazing management, minerals management, WSAs, VRM, and wildlife and fisheries management would be the same as Alternative 1.

Prohibition of off-road travel for dispersed camping and big game retrieval would protect lands in proximity to all suitable waterway segments from route proliferation, a condition that would degrade the quality of the scenery.

NSO restrictions on surface disturbing and disruptive activities, and closures to locatable mineral entry within 1/2 mile of developed and undeveloped recreation sites, would provide a wider area of protection of outstandingly remarkable values along suitable waterway segments at Bennett Peak, Corral Creek, and Big Creek.

Closures to new oil and gas leasing, locatable mineral entry, and mineral material disposal, and operation of public land laws along the North Platte River SRMA 1/2-mile-wide area on either side of the river would contribute to the preservation of the quality of ORVs along suitable waterway segments of the North Platte River. Management actions associated with the scenic classification in the National WSR System would parallel management actions under the North Platte River SRMA.

Closures to new fluid mineral leasing and the 1/4-mile development avoidance areas from ephemeral and perennial streams in the Upper Muddy Creek Watershed/Grizzly ACEC would limit the amount of new disturbance in proximity to these suitable waterway segments.

All eligible waterway segments would be determined to be, and managed as, suitable for inclusion in the National WSR System. The suitability determination would protect the segments from human impacts that would impair their suitability for designation as WSRs. This would preserve scenic waterway-related recreation opportunities.

Limitations on road densities to levels that do not diminish or adversely affect other resources or resource values would help prevent habitat fragmentation and unnecessary linear visual intrusions that decrease the desirability of the river recreational setting in proximity to suitable waterway segments.

Vegetation management priority would be given to control of noxious and invasive species and maintenance and attainment of native, weed-free communities. This would improve ORVs within the WSRs through improvement of wildlife and fish habitat, vegetation condition, and water quality. The Encampment River WSR would especially benefit from weed control because of the population of thistles adjacent to the river.

Water discharges into the North Platte River Basin that meet specific BLM land use objectives would allow BLM to prevent large surface discharges into the North Platte River. Limitations on surface discharge would prevent erosion, sedimentation, and turbidity that would potentially impact the suitability of the waterway segments for designation as WSRs.

Summary

Mineral development in proximity to Littlefield Creek, Muddy Creek, and Skull Creek would potentially impair the suitability of the segments for designation as WSRs. Prohibition of off-road travel for dispersed camping and big game retrieval would protect lands in proximity to the suitable waterway segments from route proliferation that would degrade the quality of the scenery. The IMP would protect segments that lie within WSAs from alterations to their outstandingly remarkable characteristics. Closures to new oil and gas leasing, locatable mineral entry, and operation of public land laws in the North Platte River SRMA 1/2-mile-wide corridor would contribute to the preservation of the quality of riparian settings along suitable waterway segments on the North Platte River. All eligible waterway segments would be determined to be and managed as suitable for inclusion in the National WSR System. The suitability determination would protect the segments from human impacts that would impair their suitability for designation as WSRs. The suitable waterway segments tentatively classified as wild would be managed as VRM Class I, which would preserve their outstandingly remarkable character and tentative, wild classification.

4.13.21.5 Impacts Under Alternative 4: Proposed Plan

Air quality, cultural resources, forestry, lands and realty, minerals, paleontology, transportation and access management, visual resource management, and wild horse management would have little or no impact on WSRs.

Fire and fuels, livestock grazing, VRM, water quality, watershed and soils management, and wildlife and fisheries impacts would be the same as those in Alternative 1.

Closure of the Encampment River Canyon WSA to OHV use would prevent OHV impacts from impairing the suitability of the Encampment River for WSR designation.

NSO restrictions on surface disturbing and disruptive activities and closures to locatable mineral entry in and within 1/4 mile of developed and undeveloped recreation sites would provide protection of outstandingly remarkable values along suitable waterway segments at Bennett Peak, Corral Creek, and Big Creek.

Only the Encampment River eligible waterway segment would be determined to be, and managed as, suitable for WSR designation. The proposed segment falls entirely within the Encampment River Canyon WSA. This constrains the development of alternate interim management prescriptions. Protections afforded the WSA would protect the outstandingly remarkable characteristics of the suitable river segment, unless Congress releases the WSA from wilderness consideration. In the event the WSA is released from wilderness consideration, a WSR suitability determination would protect the waterway segment and lands within 1/4 mile of the high-water line on both sides of the river from human activities that would potentially impair the segment's suitability for designation as a WSR.

Vegetation management actions would result in weed treatments within the WSR. However, the focus of treatments to eliminate small and control large infestations would allow large patches of weeds to remain in the WSR, potentially degrading the ORVs.

Summary

Closure of the Encampment River Canyon WSA to OHV use would prevent OHV impacts from impairing the suitability of the Encampment River for WSR designation.

The Encampment River eligible waterway segment would be determined to be, and managed as, suitable for WSR designation. In the event the WSA is released from wilderness consideration, a WSR suitability determination would protect the waterway segment from human activities that would potentially impair the segment's suitability for designation as a WSR.

4.14 TRANSPORTATION AND ACCESS

This section describes potential impacts on transportation and access management from other management actions. Existing conditions concerning transportation and access management are described in Section 3.14.

Significance Criteria

Impacts on transportation and access would be considered significant if either of the following occurred:

- Substantial limitation on public access to, and travel within, the RMPPA.
- Substantial reduction in opportunity for access easement acquisition and road development.

Methods of Analysis

Transportation and access provides for appropriate ingress, egress, and access in the RMPPA. Potential access and transportation impacts are characterized by changes in vehicle movement on designated roadways and trails to and from the RMPPA. Impact analyses and conclusions are based on the interdisciplinary team knowledge of the RMPPA and associated resources, review of existing literature, and information provided by BLM and other agencies. Effects are quantified where possible. In the absence of quantitative data, best professional judgment is used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- Consolidation of and access to public lands with prime recreational values would be pursued as opportunities arise.
- The transportation and access program operates as a support program rather than an environmental component. The program responds to a need to maintain an adequate transportation system to provide access to and use of public land resources.
- RFDs and RFAs can be found in Appendix 33.

4.14.1 Impacts Common to All Alternatives

The management actions under any alternative would influence the location of roads. The limitations and restrictions placed on development of roads would depend on the locations of sensitive resources and the potential environmental impacts to those resources from transportation and access actions.

Air quality, fire and fuels, forestry, livestock grazing, OHV, SD/MAs (except those listed below), socioeconomics, visual resource management, and wild horse management would have little or no impact on transportation and access to meet the goals and objectives of the program.

The protection of the setting of cultural properties (where the setting contributes to NRHP eligibility) would be achieved through avoidance or other mitigation measures (Appendix 5). In most cases, only the location of transportation and access actions would be affected. Roads would be hidden, screened, or redesigned to minimize impacts to the contributing setting.

Withdrawals that close areas to operation of the public land laws would restrict the location, or possibly preclude the construction, of new roads and the reclamation of roads that are no longer needed. The

review of existing withdrawals would determine whether the withdrawals are serving their intended purpose or needed. Withdrawals which are terminated or modified would then open public land to the operations of the public land laws, which in turn would open more public land for different types of actions and create more flexibility for placement of projects. Land acquisitions and ROW corridors would have little or no impact on transportation and access management. Impacts from alternative energy development and utility/transportation would possibly increase the number of roads within the transportation system temporarily, until a review was completed to determine if the road met the needs of the RMPPA and was included into the BLM transportation system.

Minerals actions would increase the amount of maintenance on existing BLM-designated roads within high and moderate oil and gas development areas. They also would temporarily increase the number of roads. Prior to the termination and obliteration of the road, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Paleontological resources would restrict the location of transportation and access actions which adversely affect paleontological values. Because of the relatively small area encompassed by individual paleontological resources, a transportation and access action would rarely, if ever, be prohibited.

Recreation management of developed and undeveloped recreation sites would possibly increase transportation and access actions by initiating the acquisition of easements, and improve public access within these areas. Shirley Mountains SRMA, North Platte River SRMA, and Continental Divide National Scenic Trail SRMA would possibly increase transportation and access actions by initiating land exchanges and easement acquisitions, thereby improving the continuity of the Continental Divide National Scenic Trail. Impacts from the Pedro Mountains SRMA could temporarily increase the number of roads.

Impacts from the Jelm Mountain SRMA and Laramie Plains Lakes SRMA would potentially increase transportation and access actions by initiating acquisition of lands and easements to improve recreational opportunities. In addition, reclamation of unnecessary or undesirable vehicle routes would increase transportation and access actions as well as reduce access routes in the management area.

Impacts from the Rawlins Fishing SRMA would potentially increase transportation and access actions by initiating reclamation of unnecessary or undesirable vehicle routes, which would reduce access routes within the management area.

WSA management under the IMP would preclude placement of any transportation and access actions within WSA boundaries to maintain the wilderness characteristics.

Management of the Como Bluff ACEC/NNL would include restrictions or other mitigation requirements, and/or modify the location of transportation and access actions, to protect paleontological values. Because of the relatively small area this ACEC encompasses, a transportation and access action would rarely, if ever, be prohibited.

Impacts from the Jep Canyon ACEC/Jep Canyon WHMA, Shamrock Hills ACEC, and Wick-Beumee WHMA would limit the number of roads constructed or maintained in the management area. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road does not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Management actions for the JO Ranch Expansion and High Savery Dam would preclude surface occupancy. This restriction would require the rerouting of proposed roads outside of the SD/MA boundaries.

Impacts from the Laramie Peak Potential ACEC, Red Rim-Daley Potential ACEC, Cave Creek Cave Potential ACEC, Laramie Plains Lakes Potential ACEC, Blowout Penstemon Potential ACEC, Upper Muddy Creek Watershed/Grizzly Potential ACEC, Cow Butte/Wild Cow Potential WHMA, and White-Tailed Prairie Dog Potential ACEC could temporarily increase the number of roads. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Impacts resulting from the Pennock Mountain WHMA would limit construction and maintenance of existing roads between November 15 and April 30 to protect wildlife winter range.

Protection measures for historic trails generally include avoidance of the trail or other mitigation measures designed to reduce impacts to historic trail settings. These mitigation measures would modify the location of roads, road surface coloring, and potentially prohibit transportation and access actions that would adversely affect the trail setting. Actions resulting in linear crossing of the trails would only be allowed in previously disturbed areas. This would potentially alter or preclude transportation and access actions along many segments of the historic trails.

Acquisition of easements, across private lands, would improve the multi-use opportunities on public lands and increase public access to public lands.

Protection measures for unique or important vegetation communities would include restricting the placement of transportation and access actions, or in rare cases, would prohibit transportation and access actions that would otherwise adversely affect the vegetation communities.

Restrictions on surface disturbing activities associated with water quality, watershed, and soils management, would not allow roads within distances of riparian areas or drainages. This would reduce erosion, surface runoff, and non-point sources of sedimentation.

Wildlife and fisheries management actions would modify the location and route of proposed roads. Seasonal and spatial restrictions to protect wildlife species and habitats would limit opportunities for road construction and maintenance.

4.14.2 Impacts Under Alternative 1: Continuation of Existing Management

Impacts from air quality, fire and fuels, livestock grazing, OHV, paleontology, socioeconomics, SD/MAs (except those listed below), vegetation, and wild horse management would have little or no impact on transportation and access to meet the goals and objectives of the program.

The protection of the setting of cultural properties (where the setting contributes to NRHP eligibility) would be achieved through avoidance or other mitigation measures (Appendix 5). In most cases, only the location of transportation and access actions would be affected. Roads would be hidden, screened, or redesigned to minimize impacts to the contributing setting. The protection of sensitive areas (e.g., Chain Lakes, dunal areas) would be achieved through cultural monitoring, and would have little or no impact on the transportation and access program.

Forestry and recreation would possibly increase transportation and access actions by initiating the acquisition of easements or maintaining existing easements where opportunities exist (Table 2-8).

Alternative energy development, utility/transportation systems, and communication sites would temporarily increase the number of roads. Prior to the termination and obliteration of a road, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road. However, closure of approximately 63,670 acres of public land to the operation of the public land laws, and potential disposal of approximately 61,010 acres of BLM-administered public lands (Maps 2-22 through 2-25 and Appendix 7), would, in some cases, preclude the construction of roads necessary to access public land resources.

Minerals actions would increase the amount of maintenance on existing BLM designated roads within high and moderate oil and gas development areas. They also would temporarily increase the number of roads. Prior to the termination and obliteration of a road, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Impacts from the Continental Divide National Scenic Trail SRMA, Jelm Mountain SRMA, North Platte River SRMA, Laramie Plains Lakes SRMA, Pedro Mountains SRMA, and Rawlins Fishing SRMA could temporarily increase the number of roads within the transportation system. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

WSA management under the IMP would preclude the construction of any new roads within the WSA boundaries in order to maintain the wilderness characteristics.

Management of the Como Bluff ACEC/NNL would include restrictions or other mitigation requirements and/or modify the location of transportation and access actions to protect paleontological values. Because of the relatively small area encompassed by this ACEC, a transportation and access action would rarely, if ever, be prohibited.

Impacts from the Sand Hills ACEC, Chain Lakes WHMA, Upper Muddy Creek Watershed/Grizzly WHMA, and White-Tailed Prairie Dog area could temporarily increase the number of roads within the transportation system. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Impacts from the Jep Canyon ACEC, Shamrock Hills ACEC and Wick-Beumee WHMA would limit the number of roads constructed or maintained within the management area. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Impacts from the Stratton Sagebrush Steppe Research Area Potential ACEC would preclude surface occupancy on new oil and gas leases which would reduce the number of new roads within the management area. However existing leases would be intensively managed which would limit the number of roads and possibly require the relocation/rerouting of roads and would also decrease the amount of public access into the area.

Impacts from the Laramie Peak WHMA, and Blowout Penstemon area could temporarily increase the number of roads. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of BLM's transportation system, issued permits would require the operator to reclaim the road. However, it would possibly increase transportation and access actions by initiating the acquisition of lands, easements or exchanges, to meet the multi-use objectives within the management areas.

Impacts from the Red Rim-Daley WHMA, and Cow Butte/Wild Cow Area and could temporarily increase the number of roads. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road.

Impacts resulting from the Pennock Mountain WHMA, Shirley Mountains SRMA, Cave Creek Cave area, and Laramie Plains Lakes WHMA could temporarily increase the number of roads. Prior to the termination and obliteration of any roads constructed under other initiatives, a review would be completed to determine if the road met the BLM transportation needs. If the road did not meet the needs of the BLM transportation system, issued permits would require the operator to reclaim the road. In addition, impacts would possibly increase transportation and access actions by initiating the acquisition of lands or easements to enhance access to public lands, and/or to expand habitat.

Protection measures for historic trails generally include avoidance of the trail or other mitigation measures designed to reduce impacts to historic trail settings. These mitigation measures would modify the location of the road, road surface color, and would potentially prohibit transportation and access actions that would adversely affect the trail setting.

Acquisition of easements across private lands would improve the multi-use opportunities on public lands and increase public access to public lands.

VRM management classes would potentially restrict projects within VRM Class II areas of approximately 359,610 acres. To maintain the visual settings, mitigation measures would modify the location of the road, road surface color and design and would potentially prohibit transportation and access actions.

Management actions related to water quality, watershed, and soils management actions, such as avoidance of steep slopes or erosive soils, would influence road locations and method of construction.

Mitigation measures (e.g., seasonal restrictions) to protect wildlife resources and T&E species and critical habitats would restrict the timing of surface disturbing and other disruptive activities, and would restrict the location of roads to avoid sensitive habitats.

Summary

The protection of the setting of cultural properties would be achieved through avoidance or other mitigation measures. Minerals actions would increase the amount of maintenance on existing BLM designated roads within high and moderate oil and gas development areas. WSA management under the IMP would preclude the construction of any new roads. Protection measures for historic trails generally include avoidance of the trail. Easement acquisitions for forestry, recreation, Laramie Peak Potential ACEC, Pennock Mountain WHMA, and Laramie Plains Lakes Potential ACEC would improve access. Lands and realty and minerals would temporarily increase the number of roads within the transportation system. Seasonal closures within the Cave Creek Cave SD/MA would limit vehicle access. VRM

management classes would potentially restrict projects within VRM Class II areas. Management actions related to water quality, watershed, and soils management actions would influence road locations and method of construction. Seasonal restrictions to protect wildlife resources, T&E species, and critical habitats would restrict the timing of surface disturbing and other disruptive activities. These stipulations would also restrict the location of roads to avoid sensitive habitats.

4.14.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from air quality, fire and fuels, livestock grazing, OHV, paleontology, socioeconomics, SD/MAs (except those listed below), vegetation, actions, and wild horse management would have little or no impact on transportation and access to meet the goals and objectives of the program.

Impacts from cultural resources, minerals, WSAs, Como Bluff NNL, Sand Hills WHMA, Jep Canyon WHMA, Shamrock Hills WHMA, Stratton Sagebrush Steppe Research Area Potential ACEC, Chain Lakes WHMA, Laramie Peak WHMA, Red Rim-Daley WHMA, Wick-Beumee WHMA, Shirley Mountains SRMA, Historic Trails, Upper Muddy Creek Watershed/Grizzly WHMA, Cow Butte/Wild Cow Area, White-Tailed Prairie Dog area, High Savery Dam ACEC, Continental Divide National Scenic Trail SRMA, North Platte River SRMA, Jelm Mountain SRMA, Pedro Mountains SRMA, Laramie Plains Lakes SRMA, Rawlins Fishing SRMA, transportation and access and water quality, watershed, and soils management would be the same as Alternative 1.

Forestry and recreation would only increase transportation and access actions if opportunities arise for the acquisition of land or easements.

Lands and realty management actions would be the same as Alternative 1, except that the closure of public land to the operation of the public land laws would decrease to approximately 6,400 acres. In addition, the potential disposal of BLM-administered lands would decrease to approximately 46,230 acres (Maps 2-26 through 2-29 and Appendix 7).

Impacts resulting from the Pennock Mountain WHMA, Laramie Plains Lakes WHMA, and Blowout Penstemon area would be the same as those in Alternative 1, except there would be no acquisition of lands or easements to enhance access to public lands and/or expand habitat.

Impacts from the Cave Creek Cave ACEC would be the same as Alternative 1, except for the closure to locatable mineral entry and mineral material disposal, which would reduce the number of new roads within the management area and potentially restrict public access.

Impacts resulting from VRM management classes would be the same as those described in Alternative 1, except there would be a reduction in VRM Class II acreage to 232,830 acres. This would increase opportunities for placement of transportation and access actions.

Impacts from wildlife and fisheries would result in fewer timing and distance restrictions, which would increase opportunities to route transportation and access actions and allow construction or maintenance for longer periods throughout the year.

Summary

Impacts would be the same as Alternative 1. However, there would be fewer timing and distance restrictions for wildlife and fisheries, which would increase opportunities to route transportation and access actions and allow construction and/or maintenance for longer periods throughout the year. VRM

Class II acreage would be reduced, which would potentially increase activity on roads for recreation, transportation, construction, etc. Forestry and recreation would only increase transportation and access actions if opportunities arose for the acquisition of land or easements.

4.14.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from air quality, fire and fuels, livestock grazing, OHV, paleontology, socioeconomics, SD/MAs (except those listed below), vegetation, and wild horse management would have little or no impact on transportation and access to meet the goals and objectives of the program.

Forestry, recreation, WSAs, historic trails, and transportation and access would be the same as Alternative 1.

The protection of the setting of cultural properties (where the setting contributes to NRHP eligibility) would be achieved through exclusion within a 1/4 mile of the cultural property. The monitoring of sensitive areas (e.g., Chain Lakes, dunal areas) would ensure that cultural properties not visible on the surface are protected, which would influence the location of transportation and access actions.

Lands and realty management actions would be the same as Alternative 1, except that the closure of public land to the operation of the public land laws would increase to approximately 270,610 acres. In addition, no specific tracts of BLM-administered lands would be considered for disposal.

Minerals management impacts would be the same as those described in Alternative 1, except there would more restrictions from other programs. These restrictions would reduce the number of opportunities for transportation and access management.

Closure of the Shirley Mountains SRMA to new oil and gas leases would reduce the number of new roads. This would decrease the amount of public access into the area. However, existing oil and gas leases would be intensively managed.

Closure of the Continental Divide National Scenic Trail SRMA and Rawlins Fishing SRMA to locatable mineral entry, mineral material disposals, and operation of the public land laws would reduce the number of new roads within the management areas. This would reduce public access for recreational use.

Closure of the North Platte River SRMA to new oil and gas leases, locatable mineral entry, mineral material disposal, and operation of the public land laws would reduce the number of new roads within the management areas. This would reduce public access for recreational use. However, existing oil and gas leases would be intensively managed.

Closure of the Jelm Mountain SRMA to new oil and gas leasing, locatable mineral entry, mineral material disposal, and land tenure adjustments, including sale, would reduce the number of new roads within the management area. However, existing oil and gas leases would be intensively managed.

Closure of the Pedro Mountains SRMA, Laramie Plains Lakes SRMA, and Rawlins Fishing SRMA to locatable mineral entry, mineral material disposal, and land tenure adjustments, including sale, would reduce the number of new roads within the management area. However, new oil and gas leases would preclude surface disturbance and existing oil and gas leases would be intensively managed. This would reduce the number of roads within the management area.

Como Bluff ACEC/NNL would possibly increase transportation and access actions by initiating the acquisition of easements to improve public access.

Sand Hills ACEC and JO Ranch Expansion would preclude the construction of any new roads within the management area in order to protect the sensitive resources.

Closure of the Jep Canyon WHMA to new oil and gas leases, locatable mineral entry, mineral material disposal, and operation of the public land laws would minimize the number of new roads. However, existing oil and gas leases would be intensively managed and acquisition of easements would be pursued to maintain public access.

Closure of the Stratton Sagebrush Steppe ACEC to new oil and gas leases would reduce the number of new roads. This would decrease the amount of public access into the area. However, existing oil and gas leases would be intensively managed.

Closure of the Shamrock Hills RCA and High Savery Dam Potential ACEC to locatable mineral entry, mineral material disposals, and operation of the public land laws would reduce the number of new roads within the management areas. This would reduce public access for recreational use.

Closure of the Chain Lakes Potential ACEC, Wick-Beumee WHMA, and Cave Creek Cave Potential ACEC to new oil and gas leases, locatable mineral entry, mineral material disposal, and operation of the public land laws would reduce the number of new roads within the management areas. This would reduce public access for recreational use. However, existing oil and gas leases would be intensively managed.

Closure of the Red Rim-Daley ACEC to locatable mineral entry, mineral material disposal, and land tenure adjustments, including sale, would reduce the number of new roads within the management area. However, initiating the acquisition of easements would improve public access and/or expand habitat.

Closure of the Cow Butte/Wild Cow Potential WHMA, and Upper Muddy Creek Watershed/Grizzly ACEC to new oil and gas leasing, locatable mineral entry, mineral material disposal, and land tenure adjustments, including sale, would reduce the number of new roads within the management area. However, existing oil and gas leases would be intensively managed.

Closure of the Laramie Peak ACEC, Pennock Mountain ACEC, Blowout Penstemon ACEC, and White-Tailed Prairie Dog ACEC to locatable mineral entry and mineral material disposal would reduce the number of new roads within the management areas. However, initiating the acquisition, easements, or exchange of lands would improve public access within the management areas.

Closure of the Laramie Plains Lakes Potential ACEC to new oil and gas leases, locatable mineral entry, mineral material disposal, and operation of the public land laws would reduce the number of new roads within the management area. However, existing oil and gas leases would be intensively managed. In addition, initiating the acquisition of lands or easements would improve public access and/or expand habitat.

Impacts resulting from VRM management classes would be the same as those described in Alternative 1, except there would be an increase in VRM Class II acreage to 351,050 acres. This would decrease opportunities for placement of transportation and access actions.

Impacts resulting from water quality, watershed, and soils management would be the same as those describe in Alternative 1, except management of the Encampment River Watershed would preclude new permanent roads or structures in this area.

Impacts to transportation and access from wildlife and fisheries would preclude construction during a greater part of the year and in some habitats due to increased spatial and temporal restrictions.

Summary

Reduced mineral development would decrease transportation and access opportunities as well as limit the locations of transportation and access actions because of the increase in the VRM Class II acreage.

4.14.5 Impacts Under Alternative 4: Proposed Plan

Impacts from air quality, fire and fuels, livestock grazing, OHV, paleontology, socioeconomics, SD/MAs (except those listed below), vegetation, and wild horse management would have little or no impact on transportation and access to meet the goals and objectives of the program.

Impacts resulting from cultural resource management and water quality, watershed, and soils management would be the same as those in Alternative 3.

Impacts resulting from forestry, minerals, recreation, WSAs, Chain Lakes WHMA, Laramie Peak WHMA, Red Rim-Daley WHMA, Pennock Mountain WHMA, Continental Divide National Scenic Trail SRMA, Historic Trails, White-Tailed Prairie Dog area, and wildlife and fisheries would be the same as those in Alternative 1.

Lands and realty management actions would be the same as Alternative 1, except that the closure of public land to the operation of the public land laws would decrease to approximately 14,950 acres. In addition, the potential disposal of BLM-administered lands would decrease to approximately 46,230 acres (Maps 2-26 through 2-29 and Appendix 7).

Impacts from Shirley Mountains SRMA, Jelm Mountain SRMA, Pedro Mountains SRMA, and Rawlins Fishing SRMA would be the same as those in Alternative 3, except the Jelm Mountain SRMA and Pedro Mountains SRMA would not be closed to locatable mineral entry or land tenure adjustments, which would allow for an increase in the number of new roads in these areas.

Impacts from the North Platte River SRMA would preclude surface disturbance for new oil and gas leases and existing leases would be intensively managed. This would require the rerouting of roads outside the management area.

Impacts from the Laramie Plains Lakes SRMA would be the same as those described in Alternative 3, except the area would be open to land tenure adjustments, including sale. This would increase opportunities to acquire land through exchange and/or easements for improved public access.

Impacts from Como Bluff NNL, Stratton Sagebrush Steppe Research Area, and Blowout Penstemon Potential ACEC would be the same as those in Alternative 3, except the Blowout Penstemon Potential ACEC would not be closed to locatable mineral entry, which would allow for an increase in the number of new roads in this area.

Impacts from the Sand Hills ACEC would be the same as those described in Alternative 1, except the management area would include an additional 4,720 acres for the JO Ranch acquisition. This would reduce construction of any new roads and/or maintenance of any existing roads within 2 miles or the visual horizon (whichever is closer) of the JO Ranch buildings. This requires the rerouting of proposed roads outside of the SD/MA boundaries.

Impacts from the Shamrock Hills RCA would be the same as those described in Alternative 2.

Impacts from the Laramie Plains Lakes Potential ACEC would be the same as those described in Alternative 1, except it would be closed to locatable mineral entry and mineral material disposals. In addition, the area would be closed to surface occupancy from new oil and gas leasing and existing leases would be intensively managed. Impacts from these actions are described under Alternative 3.

Impacts from the High Savery Dam area would be the same as Alternative 1 for the operation of the public land laws. All other impacts would be the same as those described under Alternative 3.

Impacts from the Cow Butte/Wild Cow Potential WHMA and Upper Muddy Creek Watershed/Grizzly WHMA would be the same as Alternative 3, except the areas would not be closed to locatable mineral entry or land tenure adjustments, which would allow for an increase in the number of new roads in these areas.

Impacts from the Jep Canyon WHMA would be the same as Alternative 1, except acquisitions of adjacent land or easements would be pursued to improve public access.

Impacts from the Wick-Beumee WHMA would be the same as those described in Alternative 1.

Impacts from the Cave Creek Cave Potential ACEC would be the same as those in Alternative 2, except the area would also be closed to land tenure adjustment, including sale, instead of operations of the public land laws. This would decrease the number of new roads as well as the amount of public access.

Transportation and access management actions would be the same as those in Alternative 3, except consolidation of public lands would be pursued to meet recreational demand (Appendix 6).

Impacts resulting from VRM management classes would be the same as those described in Alternative 1, except there would be an increase in VRM Class II acreage to 346,670 acres. This would reduce opportunities for placement of transportation and access actions.

Summary

Impacts would be the same as those described in Alternative 1 for forestry, lands and realty, minerals, recreation, WSAs, Chain Lakes WHMA, Laramie Peak WHMA, Red Rim-Daley WHMA, Pennock Mountain WHMA, Continental Divide National Scenic Trail SRMA, Historic Trails, White-Tailed Prairie Dog area, wildlife and fisheries, Jep Canyon WHMA, and Wick-Beumee WHMA.

Impacts would be the same as those described in Alternative 3 for cultural resource management and water quality, watershed and soils management, Como Bluff NNL, Stratton Sagebrush Steppe Research Area, Shirley Mountains SRMA, and Rawlins Fishing SRMA.

Impacts would be the same as those described in Alternative 2 for Shamrock Hills RCA.

Impacts would be the same as those described in Alternative 1 for operation of the public land laws for Cow Butte/Wild Cow Potential WHMA and High Savery Dam Potential ACEC.

Impacts would be the same as those in Alternative 3 for everything except the operation of the public land laws for Cow Butte/Wild Cow Potential WHMA and High Savery Dam area.

Impacts would be the same as those in Alternative 3 for everything except locatable mineral entry for the Blowout Penstemon ACEC.

Impacts would be the same as those in Alternative 3 for everything except the operation of public land laws and locatable mineral entry for the Jelm Mountain SRMA, Pedro Mountains SRMA, Cow Butte/Wild Cow Potential WHMA, and Upper Muddy Creek Watershed/Grizzly WHMA.

Impacts from the North Platte River SRMA would preclude surface disturbance for new oil and gas leases and existing leases would be intensively managed. This would require the rerouting of roads outside the management area.

Lands and realty management actions would be the same as Alternative 1, except closure of public land, to the operation of the public land laws decreases to approximately 14,950 acres. In addition, the potential disposal of BLM-administered lands would decrease to approximately 46,230 acres (Maps 2-26 through 2-29 and Appendix 7).

4.15 VEGETATION

This section presents the potential impacts on vegetation from other management actions. The order of discussion is general vegetation first, followed by Special Status Species plants and vegetation communities, followed by noxious and invasive weed management. When the word "weed" is used throughout this section, it refers to noxious and invasive weeds. Existing conditions concerning vegetation are described in Section 3.15.

Significance Criteria

Impacts on vegetation would be considered potentially significant if the following occurred:

- Any action or event that would remove a community's unique attributes or ability to support other resource values within the planning period, or if corrective actions were beyond the scope of this document.
- The viability of protected plant species is jeopardized, with little likelihood of reestablishment after disturbance, or actions result in the need to list a species under ESA.
- Actions that have the potential to remove sensitive plant species or substantially alter the habitat's ability to support the species.
- Reclaimed areas do not attain adequate vegetation groundcover and species composition to stabilize the site within 5 years from disturbance, or there is invasion and establishment of noxious or invasive weeds that contribute to unsuccessful revegetation.
- Introduction of noxious and invasive weeds into areas considered weed-free, or an increase in weeds where they already exist.

Methods of Analysis

Different program actions are assessed for their impacts on the vegetation resource. Activities affect flora resources by altering, disturbing, or removing soil and vegetation. These impacts are either mitigated or avoided when possible. Impact analysis and conclusions are based on interdisciplinary team knowledge of the region of influence and the interaction of the different management activities. The effects of each action on flora resources are quantified when possible; however, many impacts must be qualitatively assessed when suitable data are not available.

Assumptions can be made on the condition of the flora resource, vegetation, and forage responses to different stimuli, and the level of activity. The analysis is based on the following assumptions, although it is recognized that fluctuations would occur within populations and habitats based on climatic, economic, and other conditions:

- The livestock kind and stocking rate would remain relatively stable over the planning period.
- Wildlife populations would remain relatively stable over the planning period.
- Wild horse populations would remain relatively stable, at the AML, over the planning period.
- Current trends in plant succession/vegetation health would continue.

- Grassland and shrubland communities would be maintained with a mix of species composition, cover, and age classes.
- Noncommercial woodland communities would increase in age and cover with reduced composition and cover of understory species.
- Riparian areas are functioning properly or are in the process of achieving proper functioning condition.
- Noxious and invasive weeds would continue to be introduced and spread as a result of ongoing vehicular traffic in and out of the resource area, recreational activities, wildlife and livestock grazing and their movements, and surface disturbing activities.
- Noxious and invasive weeds would further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of invasive plant species.
- BLM would continue to treat noxious and invasive weeds and pests on public land. Livestock permit holders, ROW holders, and mineral lease, claim, and permit holders would continue to treat noxious and invasive weeds and pests on public land as stipulated within their permits and authorizations.
- Weed and pest control would be carried out in coordination with the appropriate county weed and pest control district and with owners of adjacent property.
- As more monitoring and survey data become available, it is possible that additional populations of existing Special Status Plants and unique plant communities might be found.
- Management of T&E plant species is subject to the ESA.
- Wildland fire would burn an average of 4,000 acres per year based on a 5-year average.

Management of Special Status Plants and Unique Plant Communities

Impacts on Special Status Plants and unique plant communities are potentially more harmful than impacts on overall vegetation, because they have narrow habitat parameters, and losses of individual plants or communities might affect the survival of the species. This section outlines the impacts on Special Status Plants and unique plant communities by management actions that have the potential to affect these plants and plant communities.

Noxious and Invasive Weeds

Most management activities on BLM-administered lands have the potential to introduce or promote the proliferation of noxious and invasive weeds. Motor vehicles, animal movement, and all surface disturbing activities increase the potential to introduce and spread weeds. Noxious and invasive weeds can outcompete native vegetation through mechanisms such as the weeds' ability to change soil chemistry or grow during different climate periods. They also can produce numerous seeds early in the growing season and rapidly grow roots to take advantage of moisture availability. Non-native species often have a competitive advantage resulting from the lack of natural controls in their new environment.

In areas where weeds have invaded, the ecology of the area is altered, and native plants that provide habitat and forage for animals are reduced or eliminated. Some of the costs of weed proliferation are

reduced forage, desertification of upland and riparian habitat, decreased animal health and/or mortality, devaluation of animal commodities, equipment decontamination, and reduced land values.

The invasion and proliferation of weeds increases the cost of weed control to entities responsible for their control. If weeds become established, treatment can be difficult and expensive, and eradication is often impossible. Areas might require several treatments over many years with mechanical equipment, biological controls, and/or herbicides designed to kill the noxious and invasive weeds with minimal loss of native vegetation.

The approved RFO Noxious Weed Prevention Plan (Appendix 31) includes BMPs for surface disturbances, roads, vehicles, livestock grazing, recreation sites, and wildland fire and prescribed fire that are designed to eliminate or minimize impacts from noxious and invasive weeds. The following paragraphs outline the impacts of different activities on the control and management of noxious and invasive weeds.

4.15.1 Impacts Common to All Alternatives

Management of air quality, paleontology, and VRM would have little or no impact on vegetation resources.

Management of cultural resources would have minor and short-term effects on vegetation resources. Management actions focus on the avoidance and protection of cultural sites, which in turn decrease surface disturbing activities on or near such sites. This might result in adjustment of the project location or design, and impacts on vegetation would still occur. Data recovery excavations, which most often occur following disturbance from other management activities, would cause minor additional surface disturbance and vegetation removal. However, standard protection measures and required reclamation practices would mitigate any effects to maintain or restore native plant communities. The areas described are small (under 1 acre), with vegetation disturbance localized and temporary.

Cultural sites are often found in sand dune areas which potentially support Special Status Plants and unique plant communities. Before cultural excavations are conducted in these areas, a vegetation inventory would be conducted. If Special Status Plants or unique plant communities are found in these areas, they would be avoided, thus causing minimal to no effect to these plants or communities.

Excavations of cultural resource sites disturb the soil surface, which increases the opportunity for the establishment of noxious and invasive weeds. However, the amount of disturbed surface would be less than 1 acre per excavation. Further, these sites would be reclaimed immediately, to minimize the chance of weed establishment or proliferation.

Surface disturbance resulting from fireline construction, use of heavy equipment, and other fire suppression activities would flatten or remove vegetation and potentially remove root systems of plants, particularly trees and shrubs. Where disturbance is minimal, plants would recover quickly and little reclamation is necessary. However, in locations where root systems and soil profile and structure have been altered, reclamation would be applied to provide site stabilization and to reestablish native species.

The use of wildland fire for resource benefit would allow wildland fire to play its natural role in the ecosystem. This would alter the plant community age structure from predominately late-seral to early- and mid-seral, creating more diverse plant communities. Many otherwise small and manageable fires would potentially burn larger areas. Wildland fire would be used to maintain and improve fire-dependent plant communities. There would be less line construction and other surface disturbance, resulting in reduced impacts on plants.

Wildland and prescribed fires result in short-term loss of vegetation. The vegetation response to fire depends on the size, location, intensity, season, timing, and amount of post-fire precipitation, as well as preexisting plant community condition and the abundance of noxious and invasive weeds in the area. Fires alter the composition of the plant community, restore early seral plant species, and remove woody vegetation and plant litter. Wildland and prescribed fires in certain situations burn with enough heat to kill soil organisms and root systems, resulting in diminished plant recruitment and growth rates, particularly for fire-sensitive species. As a whole, weed invasion following wildland and prescribed fires has been minimal and spotty, with only one severe case of musk thistle invading a wildfire site. However, cheatgrass, hounds tongue, mullen, mustard (*Alyssum spp.)*, and plume thistle have expanded on some locations after a fire occurrence.

In the long-term, wildland and prescribed fires promote improved vegetation vigor, production, and a more diverse plant community (e.g., species, cover, vertical structure, seral stage, and age class). However, this would occur on relatively small acreages (generally less than 5000 treated acres per project) and plant communities as a whole would generally remain unchanged (late seral condition). Fuel reduction projects in WUI would result in early- to mid-seral plant communities. However, these would occur on areas generally less than 40 acres in size. Wildland and prescribed fires would also cause a long-term decrease in fire-sensitive shrubs and trees, a short-term increase in annual grass and forb species, and a long-term increase in fire-resistant shrubs and trees. In most cases, a more diverse plant community evolves as fire-sensitive shrubs and trees eventually reestablish on burned sites. Fire-dependent species, such as aspen communities, would respond to fires with an increase in suckering and stand area, as well as improved clone health.

Wildland fires affect Special Status Plants and unique plant communities by temporarily removing above ground vegetation, changing community composition, setting back succession, and removing woody vegetation and plant litter. If these plants or communities depend on a specific seral stage or associative plants, a wildland fire would potentially alter the ecological characteristics necessary to support a sensitive plant's habitat or plant community. However, for fire adaptive species, wildland fires would enhance the habitat for these plants and serve as a catalyst for their reestablishment and proliferation by reducing their competition with other plants.

Wildland and prescribed fires create an opportunity for the establishment or spread of noxious and invasive weeds by removing aboveground vegetation, leaving burned areas more susceptible to weeds. Weed species that are adaptive to fire would potentially outcompete native species. In areas where noxious and invasive weeds occur or are in close proximity, wildland fire increases the likelihood of weed expansion. Firefighters and firefighting equipment have the potential to introduce or spread weeds, as well as some mechanical control activities that disturb the soil surface and remove vegetation.

Noncommercial forestlands would be managed primarily to meet forest health objectives and for the benefit of other resource values, such as wildlife, watershed, fisheries, and healthy plant communities. Management actions would include the removal of encroaching conifers from shrub and aspen stands, thinning of diseased and insect infested trees, and reducing fuel loads. These actions would result in increased vegetation diversity, earlier seral plants and communities, increased plant vigor, increased available water for herbaceous vegetation, and improved watershed health.

Lands and realty management actions include potential alternative energy development, with at least one new thousand-turbine wind power facility expected to be constructed, resulting in an estimated 1,940 acres of short-term, and 1,280 acres of long-term, disturbance and/or loss of vegetation. The designation of ROW corridors shown on Map 2-2 would result in less disturbance from utilities outside these locations and overall less disturbance and fragmentation to vegetation communities. Lands and realty management actions associated with minerals development would disturb 5,740 acres of vegetation.

The installation of utility systems and other ROW actions would result in short-term vegetation removal until the area has been reclaimed. Native grasses and forbs would dominate reclaimed sites initially, while shrubs would return over a longer period. Construction of vehicular access roads and facility locations would result in loss of vegetation. Increased erosion and decreased vegetation cover would occur from soil compaction and the channelization of surface runoff in ruts and road ditches. In locations where a road crosses a slope, overland water flow would be intercepted by the road, concentrated, and diverted through culverts. Because this runoff is not spread again below the road, erosion would be increased in the form of deeper and wider gullies, resulting in the areas below roads becoming drier, and leading to reduced plant productivity and potential change in species composition.

When proposed ROWs cross sites occupied with threatened, endangered, proposed, and candidate species and unique plant communities, the project would be rerouted to avoid disturbing them. Proposed ROWs are surveyed prior to approval; therefore, new locations of these plant species and unique plant communities would potentially be located, increasing knowledge of and the ability to protect these locations. Potential habitat of T&E plants on federal land or on split estate lands would require searches for the plants before approval of any project or activity. For federally listed species, conservation measures (USDI, BLM 2007b) would be implemented to reduce disturbance to T&E species.

Land tenure adjustment would only occur where Special Status Plants are not present (Appendix 7) to ensure the location of these species and their habitats are retained under public management and protection.

Lands and realty management actions usually result in surface disturbance, which increases the area susceptible to weed invasion or the expansion of existing weeds. Timely reclamation of disturbed areas diminishes the probability of weed proliferation. However, failure to comply with existing weed control stipulations would increase weed abundance and expansion. Land proposed for exchange or acquisition (Appendix 7) would be inventoried for weeds to ensure noxious weed infestations would not be inherited.

Impacts on vegetation resulting from livestock grazing management actions include livestock grazing, range improvements, and associated activities such as herding and placing of supplements. Because livestock grazing has the ability to alter the amount and type of vegetation present on the landscape, it can be used as a tool to manipulate and improve plant community composition.

Grazing management strategies, such as rotation, deferment, rest from use, and the manipulation of season of use and grazing intensity, would be implemented to manage the composition, cover, and vigor of vegetation. Historic grazing practices usually involved long duration of use during the growing season, resulting in repeated grazing and reduced vigor of desired plants and alteration of species composition. Current grazing strategies provide rest periods for plant growth and seed production to maintain plant composition and vigor, with the objective of maintaining or reaching rangeland health standards for wetland/riparian areas and upland plant communities. Management of grazing through the use of riparian pastures and exclosures would increase the density, age class, and cover of desirable riparian plants, including willow, cottonwood, and herbaceous wetland/riparian plants. Livestock management would affect the timing, type, and location of vegetation treatments, and vegetation recovery would be affected by the grazing strategy implemented following a treatment.

Range improvements would result in minor and short-term disturbances to vegetation, including the flattening or loss of vegetation cover due to construction activities. Long-term loss of vegetation would occur in proximity to water troughs, pits, and reservoirs, and along fence lines where roads or animal trails exist. However, plant composition and vigor would potentially be improved as a result of newly available water sources, fences, and grazing management.

Herding or checking on livestock involves the use of horses or vehicles that remove or trample vegetation to a minimal degree. Placement of salt or other supplements for livestock use results in trampling and small bare areas of vegetation around these sites. In locations where containers are not used, changes in soil chemistry would also occur that would delay long-term recovery of vegetation. Historic and currently used bed grounds (for sheep) often have disturbed soil, trampled vegetation, deposited manure, and resulted in a loss of plant cover, which usually results in localized areas dominated by annuals, invasive, or other less desirable plants. Long-term trampling on certain soil types would cause soil compaction that would restrict or delay plant recovery at these sites and along trail corridors.

Livestock grazing sometimes maintains or creates habitat for Special Status Plant Species and unique plant communities by creating disturbance areas or by reducing vegetation competition. However, livestock grazing would potentially reduce the occurrence of plants as a result of trampling or consumption. Approximately 15 acres are excluded from grazing to protect the sensitive plant Gibbens' beardtongue. Known locations of Special Status Plant Species and unique plant communities would be avoided when planning range improvements to decrease potential loss of these plants and communities.

Livestock can transport seeds and fruits of invasive species to other areas through seeds sticking to their hair and later coming off, or through ingestion followed by deposition of fecal matter. Disturbed areas where animals concentrate are particularly vulnerable to infestations of noxious and invasive weeds. In addition, range improvements that disturb the soil provide opportunities for weed introduction or invasion. The overuse of native vegetation in areas where BMPs have not yet been implemented would increase the susceptibility of an area to weed invasions. Grazing management that results in healthy plant communities reduces the establishment and spread of noxious and invasive weeds.

Oil and gas management actions would result in the localized removal of vegetation to build well pads, roads, and other associated infrastructure. Mineral development actions would also fracture continuous vegetation communities, change plant community structure and diversity, and alter vegetation landscapes. The majority of minerals impacts on vegetation are on the sagebrush-grass and saltbush steppe communities. Long-term impacts would mostly be associated with the location and design of roads. Lack of adequate compaction, road surface, and type of materials used in construction affect the amount of dust created that settles out on vegetation and results in reduced palatability, production, and eventually species composition. Increased erosion and decreased vegetation cover would occur from soils compaction and the channelization of surface runoff in ruts and road ditches. In locations where a road crosses a slope, overland water flow would be intercepted by the road, concentrated and diverted through culverts. Since this runoff is not re-spread below the road, erosion is increased in the form of deeper and wider gullies resulting in the areas below roads becoming drier leading to reduced plant productivity and potential change in species composition. Similar impacts would occur for leaseable, locatable, or common variety minerals. The regulatory authorities, although they might differ among the mineral classifications, are in place to protect existing vegetative communities and/or to assure reestablishment of new vegetation following completion of the mineral extraction and reclamation cycle. Mineral resource development actions would benefit vegetation resources by changing vegetation composition in locations where other treatments would usually not be cost-effective to obtain similar results. Examples of this include altering species and age class to diversify communities, including restoration of plant species removed through historic practices. Proposed new mineral development involving surface disturbing activities would require identification of Special Status Plant Species and unique plant communities, which would result in avoidance or mitigation to protect these plants and/or vegetation communities. Native grasses would dominate reclaimed sites in the short-term, while forbs and shrubs would return over a longer period.

Oil and gas development involves cross-country travel to stake well locations and associated roads and pipelines. Frequently, these cross-country routes are not the locations of eventual roads and pipelines. Each of these cross-country trips crushes native vegetation, and increases soil susceptibility to erosion and

degradation of the vegetation community, particularly on moderate to steep slopes and during wet climate conditions. In addition, surface flows would increase along vehicle tracks in loamy soils due to an increase in soil compaction and reduced infiltration, resulting in reduced plant growth. Research has shown that it is common for water infiltration in wheel tracks to be reduced to approximately 50 percent of the infiltration rate without traffic (Lindstrom and Voorhees, 1980; Young and Voorhees, 1982; Ankeny et al., 1990; Allen and Musick, 1997). Kemper et al. (1982) measured reductions in infiltration rates from 12 to 80 percent. Kemper et al. (1982) and Allen and Musick (1997) found the water content of the soil at the time of compaction had a significant impact on infiltration, as did the compacting loads. Ankeny et al. (1990) concluded that compaction primarily destroys the large pores that are necessary for retaining water available for plant growth. This would result in lower plant vigor and production and potentially in changes in species composition.

Geophysical exploration would compact soils and crush minor amounts of vegetation. These actions would temporarily reduce the availability, structure, and productivity of the vegetation communities. They thereby would temporarily degrade the protection that vegetation provides for soil stability and maintenance of the plant community. Any repeated vehicular travel associated with geophysical activity would increase the potential for erosion by crushing vegetation and compacting soils. The impacts associated with vehicular travel would be the same as those described for oil and gas development.

Quarries and mines associated with locatable and saleable minerals typically remove 1 to 10 acres of vegetation during operation of the project. Reclamation is required which would reestablish native plants in disturbed locations. When completed properly, reclamation would increase plant species diversity and promote earlier seral plant communities in the short term by replacing shrubs with grasses and forbs. Shrubs would eventually be reestablished in the long term through reclamation or encroachment into adjacent undisturbed vegetation.

All minerals management activities have the potential to introduce and spread noxious and invasive weed seeds from vehicles and equipment. Equipment from outside the area would bring in weeds, including new invasive species. Mineral resource development activities that occur in undisturbed and remote areas also have the potential to distribute weed seeds into weed-free areas.

OHV users would introduce and spread noxious and invasive weed seeds from their vehicles, shoes, clothing, and recreational equipment. As OHV use increases, people from outside the area would bring in weeds, including new invasive species. OHV activities in undisturbed and remote areas have the potential to distribute weed seeds into weed-free areas. The use of OHVs off of existing roads and vehicle routes is allowed for “necessary tasks,” except in WSAs and some SD/MAs, which would result in trampling, disturbance and, in some cases, loss of vegetation.

Paleontology excavation and research activities would cause short-term, small, and localized loss of vegetation in locations where the topsoil is disturbed or removed. The areas described are small (under 1 acre), with vegetation disturbance localized and temporary, until reclamation is implemented that would restore native vegetation. Disturbance to Special Status Plants and unique plant communities would be avoided or mitigated by paleontology activities which would minimize or prevent disturbance or loss of plants in these areas.

Recreational activities, such as camping, hiking, and backpacking, would result in localized vegetation disturbance from trampling, constructing fire pits, digging latrines, and other campsite activities. Activities that do not require a permit, such as camping outside developed campgrounds, would potentially cause minor disturbance on sensitive plants and their habitats. Recreational activities would introduce and spread noxious and invasive weed seeds via vehicles, shoes, clothing, and recreational equipment, particularly as greater numbers of visitors come from areas with different types of weeds.

Recreation activities that occur in undisturbed and remote areas would increase the likelihood of distributing weed seeds into weed-free areas. Proposed, developed recreation sites and permitted, organized events would increase the effects of recreation on vegetation described earlier in this section.

Increases in the region's population and recreational use would impact vegetation and the demand on it for various uses. As more people travel, recreate, hunt, and otherwise enjoy BLM-administered public lands, vegetation resources are trampled from foot, animal, bike, and vehicle travel. This occurs on small, localized areas, and the effect is generally minimal. Conversely, education of those parts of the public that use and value these resources creates advocates for the natural ecology and traditional uses of the vegetative resources, which potentially would result in reduced disturbance to vegetation resources.

Special designations/management areas would be managed to protect the unique or important resource values identified for each area, which would reduce or eliminate effects from other management activities upon vegetation. Exclusion and avoidance areas for utility/transportation systems and wind energy development would protect and maintain vegetation values, with acreages varying by alternative. Existing and proposed withdrawals of areas from locatable mineral entry and public land laws would preclude surface disturbance and protect and maintain plant species and communities, and these also vary by alternative in acreage affected. Specific impacts to vegetation are described for each SD/MA under their respective sections. WSAs (Map 2-6) would be managed to maintain suitability for preservation as wilderness. This management would maintain or improve soil and water resources by limiting surface disturbance that could contribute to erosion and non-point sources of sediment and other pollutants. The IMP for WSAs prohibits or restricts motorized equipment use, which would limit vegetation and weed treatment options in these areas. Dispersed hiking and equestrian use would increase the potential for the introduction or spread of noxious and invasive weeds.

Expansion of the transportation network would result in the permanent loss of vegetation. Areas disturbed during road construction, and which do not become part of the permanent road system, would be reclaimed. New transportation corridors would avoid Special Status Plant Species and unique plant communities. As proposed projects are reviewed before construction, new locations of these plants would potentially be discovered and protected from disturbance. Transportation corridors typically result in the highest density of noxious and invasive weeds occurring in the region due to on- and off-road vehicle dispersion and construction and maintenance activities.

Vegetation treatments result in the short-term loss of vegetation and changes in plant species, cover, age-class, and vertical structure. In the long term, treatments would improve the health and vigor of the vegetation community, increase vegetation diversity, alter vegetation seral types (e.g., changes from shrubs to herbaceous vegetation), and modify age class and structure.

Treatments in areas supporting threatened, endangered, proposed, and candidate plant species would be avoided which would minimize or prevent disturbance or loss of plants in these areas, unless it would maintain or enhance their occurrence. These plant species (because of their limited size and distribution) would be adversely affected by the introduction and proliferation of weeds, particularly since weed species are usually more competitive than native species. Where known populations of T&E species occur, withdrawals from locatable mineral entry would ensure that T&E species were protected.

Weed management actions would control some noxious and invasive weed populations resulting in healthier native plant communities. There would also be a reduction of these species invading outward from disturbed areas into native plant communities. Mechanical vegetation treatments that increase soil surface exposure or disturbance would increase the potential for the establishment of weeds. These impacts would potentially be avoided by using chemical or biological treatments. Prescribed burns occur in the cool seasons (April–June and September–November). These burns are usually much cooler on the

soil surface and would not burn the root crowns of herbaceous plants. Following prescribed fire, native herbaceous plants return with increased vigor, which reduces the likelihood of weed infestations.

Effective watershed management would result in healthy and diverse plant communities. The avoidance of surface disturbance around wetland/riparian areas, perennial surface waters, identified flood plains, and ephemeral channels would further protect the loss or degradation of vegetation from surface disturbing activities. Construction of projects would adhere to soils, watershed, and water quality recommendations to maintain vegetation cover and minimize disturbance to soils and vegetation. Development of off-site water sources and the use of exclosures to protect seeps and springs would reduce livestock concentrations in wetland/riparian areas and improve vegetation composition, vigor, and cover. Approximately 10 headcut remediation projects and 25 miles of stream restoration would occur, which would temporarily damage vegetation, especially when heavy equipment is used in construction (Appendix 11). These projects would benefit vegetation through improved site stability and soil moisture availability, by reestablishing natural watershed and hydrologic conditions. These activities would assist in maintaining or achieving Standards for Healthy Rangelands (1997).

Management actions aimed at maintaining or improving soil and water conditions and minimizing soil erosion would also maintain or improve the condition of vegetation. These activities would occur in the Muddy Creek, Sage Creek, and Encampment River watersheds, and other watersheds located above 303(d)-listed waterbodies in Class 1 waters identified by the State of Wyoming (Map 2-20). Watershed management actions would avoid negatively affecting sensitive plants and communities. Maintenance of good soil condition would enhance the viability, vigor, and abundance of Special Status Plant Species and unique plant communities. Watershed management, including the application of BMPs, would reduce the acreage and location of soil disturbance and minimize erosion, which would help decrease the potential for weed establishment and spread.

Wild horse populations would remain at the current AML of 700 horses in the Adobe Town HMA, and 150 horses in the Stewart Creek HMA; however, this would potentially change based on future monitoring. Current concentration areas, forage utilization, and seasonal movement patterns would maintain existing plant communities.

Wild horse management actions result in minimal impacts on vegetation. Gathering efforts would result in short-term, localized trampling of vegetation in areas where wild horses are herded and confined. Wild horses prefer grasses in their diet, but would also graze forbs and shrubs depending on the season and availability of other forage. Behavior between studs and mares results in ground disturbance which provides openings for establishment of new plants. Trails commonly used in rougher terrain or near water sources become compacted with reduced vegetation cover and composition. Wild horses trample and repeatedly graze riparian vegetation around watering locations and compact the soil, which reduces riparian species cover and diversity. Fencing and development of seeps or alternative water sources protect natural waters, while providing other adequate sources for wild horses to use. The distribution, population, and grazing intensity of wild horses would affect the timing, type, and location of vegetation treatments. Vegetation recovery following a treatment would be slowed from concentrated, year-round use by wild horses.

Wild horses would have minimal effect on threatened, endangered, proposed, and candidate plant species and unique plant communities. Wild horses would contribute to the spread of noxious and invasive weeds. Weed seeds and fruits can either attach to animals or be ingested. They can then be transported to other areas where they are spread by the animal physically removing the seed or fruit, or through the deposition of fecal matter. Areas where animals concentrate and disturb the soil are particularly vulnerable to infestations of weeds.

Wildlife and fish management actions primarily relate to protecting critical habitat locations and times important to sustaining viable populations, which also protect or promote the minimizing of disturbance to vegetation in these areas. When surface disturbing activities do occur, reclamation is often guided by watershed/soils and wildlife needs, which promote restoration of native plant species and vegetation connectivity to maintain plant community ecology.

Most wildlife browsing or grazing has little impact on vegetation, because wildlife move frequently and tend to not re-graze forage unless they are confined. Minor effects to vegetation occur from wildlife trails, bedding areas, and other congregation areas. However, due to highways, fences, and loss of habitat, big game species do concentrate in some winter range areas, resulting in heavy browsing of shrubs, spreading cover and lower structure, and in some cases composition shifts from sagebrush, bitterbrush, and mountain mahogany to conifers, grasses, forbs, annuals, and occasional bare ground. Browsing of desirable shrubs in riparian habitat affect the density, height, and vigor of willows, aspen, water birch, cottonwood, dogwood, and currant. Prairie dogs affect the density and type of herbaceous vegetation around their towns. Beaver reduce the density of woody, deciduous, streamside vegetation, although ponds that beaver create often raise the water table, allowing for expansion of riparian vegetation. However, when beaver dams wash out, the drained pond area provides bare ground where willow would reestablish. The distribution, population, and grazing intensity of wildlife would potentially change vegetation treatments, and vegetation recovery following a treatment would be delayed or altered based on the amount and timing of wildlife use that occurs.

Management of wildlife and fish habitat would have minimal effect on Special Status Plant Species and unique plant communities. Wildlife would contribute to the spread of noxious and invasive weeds when weed seeds and fruits either attach to animals or are ingested. These seeds or fruits are then transported to other areas where they are spread by the animal physically removing the seed or fruit, or through the deposition of fecal matter. Areas where animals congregate, such as on crucial winter range or in prairie dog towns, are particularly vulnerable to infestations of noxious and invasive weeds.

4.15.2 Impacts Under Alternative 1: Continuation of Existing Management

Management of air quality and VRM would have little or no impact on vegetation resources.

Impacts from paleontology, recreation, and transportation and access management would be the same as those in Common to All.

Limitations on surface disturbing activities within 1/4 mile of sites where the setting contributes to the NRHP eligibility would protect vegetation resources associated with the cultural sites, which in turn would maintain or enhance forage conditions at the site.

Fire and fuels management (AMR) would result in wildland fire affecting 4,000 acres per year that would alter the plant community age structure from predominately late-seral to early- and mid-seral, creating more diverse plant communities. Wildland fire and suppression efforts would continue to create opportunities for weed invasion and expansion.

Forest management actions that affect vegetation include tree thinning, timber harvesting, and other practices used to improve forest health. Thinning trees results in improved vigor of the remaining trees and a more open tree canopy, which increases herbaceous plant cover. This action also contributes to fuel reduction, which would reduce the frequency and intensity of wildland fires. Harvesting of commercial forestlands would increase herbaceous vegetation in the short term. Temporarily improved roads and skid trails would have short- and long-term impacts on vegetation cover, depending on the scale of the timber

harvest and whether the roads and skid trails are needed for future harvesting. If necessary, clear-cut areas, roads, and skid trails would be reclaimed to initially establish herbaceous vegetation for soil stabilization, followed by tree plantings. Roads would be revegetated within 3 to 5 years after closure. The effect of these actions on vegetation would be a lower density of trees and a lower fire potential, because harvested areas would serve as fuel breaks for wildland fires.

Known locations of Special Status Plants and unique plant communities would be avoided or mitigated by the timber harvesting plan to ensure the stability of these species and communities. Firewood gathering and Christmas tree cutting would be restricted in areas supporting Special Status Plant Species and unique plant communities to reduce disturbance to these plants.

Forest management actions, including small timber sales, firewood gathering, and other permitted activities, would potentially result in the introduction and/or spread of noxious and invasive weeds. The vehicles, equipment, and/or animals used in these actions, as well as the operator's clothing, have the potential to transport weed seeds to the project site. With the application of proper forest management practices, the introduction and spread of noxious and invasive weeds from small timber sales and thinning projects would be minimal.

Lands and realty management actions would result in the disturbance of 5,740 acres (with approximately 45 percent of this acreage expected to be reclaimed in the short term), which would alter or remove vegetation and be susceptible to weed invasion. An additional 63,670 acres of land would be added to the 935,530 acres already withdrawn, which would remove these areas from sale and mineral location or entry, and reduce the potential for disturbance of plant species and communities.

Livestock management would be guided by the requirement to meet the Standards for Healthy Rangelands (USDI, BLM 1997) that would promote healthy upland and riparian/wetland plant communities. Construction of reservoirs and pipelines would be implemented along with other types of range improvement projects that would affect 900 acres of vegetation through trampling, disturbance, or the total loss of vegetation. However, these projects in conjunction with the application of grazing systems and BMPs would help reduce effects associated with livestock, in order to maintain or improve vegetation cover, vigor, structure, and species composition. As these values improve, bare ground would be minimized, leading to reduced opportunities for the introduction and spread of weeds.

Conversions from cattle or sheep to bison in blocked public land areas would continue to considered, with approval being a discretionary action by the local field office manager. Where conversion to bison use is approved, it restores a natural component to the native vegetation ecology, which evolved with bison grazing. Plant selection, grazing patterns, and behavioral effects from wallows and dusting areas contribute more natural effects upon vegetation than with sheep and cattle grazing.

Impacts from mineral management actions would be the same as described in Common to All. In addition, minerals management actions would result in the disturbance of 61,895 acres of vegetation (3,095 acres per year) and 3,388 miles of road sides that would be susceptible to weed invasion. Reclamation would restore approximately 47,500 acres in the short term to ensure site stability and reestablishment of the native plant community. Mineral resource development activity can mitigate weed proliferation through ongoing reclamation and eradication programs during operational phases and in conjunction with final site reclamation. Immediate and successful site reclamation results in increased cover or density of native plants, which would help preclude weed invasion. Failure to comply with existing weed control stipulations would continue to increase weed abundance and proliferation.

OHV management actions, in addition to those described under Common to All, would include the following. OHV use off of existing roads and vehicle routes is allowed for "necessary tasks," big game

retrieval, and to access campsites, except in WSAs and some SD/MAs, which would result in trampling, disturbance and, in some cases, loss of vegetation. OHV management would close 23,020 acres to OHV activities, which would protect vegetation from trampling and other disturbance. OHV use limited to existing roads and vehicle routes would continue use in poor road locations, which contributes to accelerated soil erosion and desertification associated with gullies, resulting in reduced plant cover, production, and species composition.

SRMAs would in most cases help protect, maintain, and/or enhance vegetation resources. However, visitor use and access is promoted in SRMAs, which would increase popularity and visitation, resulting in increased vegetation disturbance from trampling and increased potential for weed introduction and spread.

SD/MAs such as ACECs, NNLs, and WSAs would in most cases help protect, maintain, and/or enhance vegetation resources. The Upper Muddy Creek Watershed SD/MA has the most potential impacts to vegetation resources because stream segments exist within or below the SD/MA boundaries listed with threats on Wyoming's 303d list (Appendix 11) that require sufficient vegetation cover, structure, and stability to meet their designated uses. Public lands in, and upstream of, reintroduction areas for CRCT (4,520 acres) would be unsuitable for further coal leasing, which would protect vegetation from disturbance related to overlying coal formations. Rehabilitation of degraded stream reaches would take place to improve vegetation for fish habitat, with short-term disturbance of plants expected. However, activities would be designed to have long-term benefits to soil, water, and vegetation resources. Surface disturbing activities in some aspen and mountain shrub communities would be lessened through mitigation measures to minimize disturbance or loss of these plant communities.

River segments that have been identified as eligible for WSR designation (140 miles) would have greater restrictions relating to stream impoundments, vehicle crossings, diversions, channelization, and/or rip-rapping. These would limit projects in these river segments and thereby protect upland and riparian vegetation from surface disturbing activities.

The closure of roads within most WSAs would reduce the potential for vehicles distributing noxious and invasive weeds, compacting soil, and damaging vegetation, because vehicles are limited to boundary roads. Management actions that restrict surface disturbing activities within ACECs would minimize disturbance to vegetation. The Sand Hills ACEC protects approximately two-thirds of the unique bitterbrush/sagebrush plant community. The remaining third, which is in the checkerboard land pattern, would be managed as a portion of the Upper Muddy Creek Watershed SD/MA.

Vegetation treatments would occur on an average of 2,500 acres per year, or 50,000 acres over the next 20 years. This average includes using prescribed fire on 1,500 acres per year, chemical treatments on 1,000 acres per year, and minimal use of mechanical treatments. In spite of this existing level of annual treatment, the seral condition class would remain predominantly late (e.g., dominated by mature to decadent vegetation). Reintroduction of prescribed fire into the ecosystem would increase ecological diversity, vegetation structure, and age class distribution. Herbaceous cover would still be inadequate for watershed protection, and would continue to decrease in cover and production as plants age and site conditions degrade.

Treatments in areas supporting Special Status Plants and unique plant communities would be avoided, which would minimize or prevent disturbance or loss of plants in these areas, unless it would maintain or enhance their occurrence. Special status plant species and unique plant communities (because of their limited size and distribution) would be adversely affected by the spread and proliferation of weeds. However, infestations would be controlled through aggressive use of weed treatments.

Noxious and invasive weed treatments would occur on 2,800 acres per year by BLM and other agents, including ROW lease holders, and oil and gas companies. Weeds would remain untreated on roughly 15,000 acres. Infested acreage would continue to decline plant diversity and productivity and would provide the seed source for further expansion into native rangelands as invasive weeds displace native plants.

Water quality, watershed and soils management actions, which allow for surface discharge of produced waters into stream channels from oil and gas activities, would alter riparian vegetation to accommodate higher quantity and/or persistence of flow regimes. In ephemeral channels, existing vegetation would be lost through erosional processes. In more stable locations where vegetation would potentially reestablish, composition would be dominated by salt-tolerant species. Perennial drainages would widen and have more defined channels. Where regulated flows mimic natural patterns, site stability would be maintained and vegetation cover and structure would be improved while composition would shift to more salt-tolerant species.

However, where flow patterns do not mimic natural patterns, site stability would be reduced and vegetation composition, cover, and structure changes would potentially be in long-term transition. When project discharges cease, vegetation would need to readjust to natural flow conditions. These vegetation transition times would favor weed and other aggressive plant species and would potentially permanently alter vegetation communities in riparian areas. Infiltration/evaporation reservoirs would disturb vegetation during construction and require reclamation that may take 20–50 years to reestablish comparable vegetation communities. If these reservoirs infiltrate and contribute to shallow groundwater, seeps may be created or riparian vegetation established. Impacts would be similar to those described for vegetation in stream systems.

Wild horse populations would remain at the current AML of 70 horses in the Lost Creek HMA. However, this would potentially change based on future monitoring. Current concentration areas, forage utilization, and seasonal movement patterns would maintain existing plant communities.

Wildlife habitat management timing and distance restrictions to protect wildlife values would affect vegetation treatments by decreasing the window of opportunity, changing the scale, type of treatment, and/or location of proposed projects.

Summary

Vegetation management actions would promote achievement of the Standards for Healthy Rangelands (USDI, BLM 1997). However, there would continue to be an increase in decadent plant communities and weed proliferation resulting from insufficient acreage being treated. The treatment of only 50,000 acres of vegetation (2,500 acres annually) would result in the majority of vegetation communities remaining in late succession. This treatment would not allow plant communities to adequately support other resource uses. The treatment of only 56,000 acres of noxious and invasive weeds (2,800 acres per year) would not be sufficient to slow the proliferation of weed species, further reducing the productivity of vegetation communities. The disturbance of 61,895 acres of vegetation (3,095 acres per year) from minerals management actions, 7,680 acres from lands and realty management actions, and 900 acres from livestock management actions would be susceptible to weed invasion. Approximately 47,500 acres of this disturbance would be reclaimed, which would return vegetation cover and forage production to most of this acreage. Existing acres affected by wildland fire (4,000 acres per year) and suppression efforts would continue to create opportunities for weed invasion and expansion. Utility/transportation systems and wind energy development and associated disturbance to vegetation would be excluded from 111,770 acres, with avoidance measures implemented on another 489,090 acres. Estimated total withdrawals would help protect vegetation on 63,670 acres.

4.15.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Management of air quality and VRM would have little or no impact on vegetation resources.

Impacts from cultural resource, lands and realty, OHV, paleontology, transportation and access, water quality, watershed, and soils, and wild horse management would be the same as those in Alternative 1.

Fire and fuels management would result in an emphasis on fire suppression efforts which would decrease the likelihood of high-intensity fires in the short term. However, this action would promote fuel accumulation and lead to increased size and intensity of wildfires in the long term, creating greater acreages of early seral plant communities and reducing abundance of fire-sensitive species. Increased suppression activity would increase soil disturbance and potentially increase susceptibility to weed invasion and proliferation. However, the smaller number of acres burned during the hot season (2,000 acres per year) would reduce opportunities for weed invasion.

Forest management actions would increase the disturbance upon vegetation and on noxious and invasive weeds by increasing the allowable level of commercial timber harvest and associated activities compared with Alternative 1. Additional human and vehicle presence would increase ground disturbance and potentially the establishment and/or spread of noxious and invasive weeds. Other impacts would be the same as Alternative 1.

Livestock management actions, which are to emphasize commodity production, would result in impacts similar to Alternative 1 because livestock grazing management would still be required to meet Standards for Healthy Rangelands (USDI, BLM 1997). There would be more intensive management, consisting of a greater number of pastures, water developments, and associated activities that would increase the area of vegetation disturbed, trampled, grazed, or replaced with a range improvement project. The change in emphasis of range improvements to develop more reliable water sources, including larger reservoirs, would also increase the acreage of vegetation disturbed to 1,140 acres. However, additional reliable water sources would allow for increased adherence to prescribed grazing systems, would reduce duration of use, and would control the season of use in pastures to improve vegetation vigor and species composition.

Minerals management activities would result in additional disturbances, primarily from expanding oil and gas development, which would increase the amount of vegetation removed or disturbed. Approximately 63,649 acres of disturbance would occur, an increase of 3 percent compared with Alternative 1. Reclamation would restore approximately 46,636 acres in the short term to ensure site stability and reestablishment of the native plant community.

Impacts from management of SRMAs would be similar to Alternative 1, except the establishment of an OHV SRMA would result in trampling, disturbance, and removal of vegetation.

Special designation/management area management would be similar to Alternative 1, except there would be greater opportunity for impacts from surface disturbance activities as a result of less restrictive management. For example, none of the 140 miles of river segments considered eligible for wild and scenic designation would be managed for the values identified. An increased amount of surface disturbance in these areas would result in increased trampling, disturbance, loss, or replacement of vegetation species and/or communities.

Vegetation management actions would affect an estimated 24,400 acres per year that would undergo vegetation treatments, with an emphasis on landscape-scale projects. This tenfold increase in vegetation disturbance would increase the proportion of early- and mid-seral plant communities to late-seral plant

communities. This increase would result in vigorous, diverse, and productive plant communities, but would also increase the opportunity for weed invasion and expansion. Prescribed fire treatments would reintroduce fire into fire-dependent plant communities on a landscape-scale, from which they have been long absent. The reintroduction of fire into the ecosystem would increase ecological diversity, vegetation structure, and age class distribution. Management of aspen stands for early seral conditions would positively affect vegetation. Aspen is a disturbance-dependent early succession species that usually dominates a site only until conifers and other shade-tolerant species replace it (Mueggler 1985). Therefore, managing aspen colonies for early seral conditions would increase total aspen cover and increase vegetation diversity and understory production in aspen stands (Kay 1997).

Impacts to sensitive plants species from vegetation management would be greatest under Alternative 2. Occupied, threatened, endangered, proposed, and candidate species plant habitat would be protected through avoidance and other mitigation measures. However, potential habitat for expansion of these species would not be protected. Consequently, opportunities for population increases would potentially be reduced. State-sensitive species and unique plant communities would not be analyzed on a case-by-case basis, which would potentially increase disturbance to these species' habitat.

Weed treatments would occur on 25,786 acres per year by BLM and by the other agents. There would be an emphasis on all weeds, including poisonous plants, to enhance commodity production from rangelands. Infested acreage would continue to decline in plant diversity and productivity and would provide the seed source for further expansion into native rangelands as noxious and invasive weeds displace native plants in the short term. However, in the long term, treatments would slow the proliferation of existing weed species and the introduction of new weed species into new areas until all areas received treatments.

There would be fewer restrictions on the timing of vegetation treatments for the protection of wildlife species, which would allow longer periods for weed treatment and habitat manipulation projects. The scale and type of vegetation treatment would also be less restricted.

Summary

Vegetation management actions would promote achievement of the Standards for Healthy Rangelands (USDI, BLM 1997). Vegetation treatments would emphasize landscape-scale projects that would increase the proportion of early- and mid-seral plant communities to late-seral plant communities. Projected annual vegetation treatments would occur on 24,400 acres, which is the greatest level of treatment. This tenfold increase from Alternative 1 would result in vigorous, diverse, and productive plant communities, but would also increase opportunities for weed invasion and expansion.

The disturbance of 63,663 acres of vegetation (3,183 acres per year; a 3-percent increase) from minerals management actions, 7,680 acres from lands and realty management actions, and 1,140 acres from livestock management actions would be susceptible to weed invasion. Approximately 46,636 acres of this disturbance would be reclaimed, which would return vegetation cover and forage production to most of this acreage. Acres affected by wildland fire would be reduced (2,000 acres per year), which would also decrease opportunities for weed invasion and expansion. Utility/transportation systems and wind energy development and associated disturbance to vegetation would increase, and be excluded from 66,720 acres, with avoidance measures implemented on another 421,030 acres. Estimated total withdrawals would help protect vegetation on 6,400 acres.

Sensitive species and unique plant communities would not be analyzed on a case-by-case basis, which would potentially increase disturbance to these species' habitat.

There would be no significant impacts on weed management. Treatments would occur on a scale (25,786 acres annually) that in the long term would control the introduction and slow the proliferation of noxious, invasive, and poisonous weeds.

4.15.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Management of air quality and VRM would have little or no impact on vegetation resources.

Impacts from paleontology, recreation, and transportation and access management would be the same as those in Alternative 1.

In addition to impacts from cultural resources management under Alternative 1, surface disturbing activities would be prohibited within 1/4 mile of cultural sites where the setting contributes to the NRHP eligibility, which would protect vegetation resources in these areas.

Impacts from wildland fire management actions would be similar to those under Alternative 1, except that the use of wildland fire for resource benefit would be emphasized, which would more than double the acreage burned (10,000 acres per year) and would allow wildland fire to play its natural role in the ecosystem. Fire management actions would alter the plant community age structure from predominately late- to early- and mid-seral, creating more diverse plant communities. Many otherwise small and manageable fires would potentially burn larger areas. Wildland fire would be used to maintain and improve fire-dependent plant communities. This alternative would require less line construction and other surface disturbance from suppression efforts, resulting in reduced acreage where weed invasion would potentially occur.

Forest management actions include the termination of commercial timber harvesting, which would increase woody vegetation, fuel loading, and the age class structure of conifer stands characteristic of a mature forest plant community. Understory diversity and production would decrease, while plant species adapted to late-seral forest communities would increase in dominance. The potential for resource-damaging wildland fires, insect infestations, and disease would increase. Although early-seral plant species, such as aspen, would decrease in abundance and distribution in these areas, mature forest communities would comprise less than 20 percent of all woodlands.

The elimination of commercial timber harvesting would reduce the surface disturbance that would potentially lead to establishment of noxious and invasive weeds. It also would reduce the potential to disturb Special Status Plant Species and unique plant communities.

Lands and realty management would result in a lower amount of vegetation disturbance because of fewer ROW actions, which proportionately reduces opportunities for the establishment and spread of noxious and invasive weeds.

Livestock management would emphasize the implementation of grazing strategies and range improvements to meet DPC objectives, which would include more intensive livestock management and monitoring to improve and document changes in vegetation health. Implementation would ensure vegetation impacts from grazing are minimized, and range improvements would emphasize modification of fences and small-scale water projects (spring and seep developments rather than reservoirs), resulting in reduced disturbance (420 acres) to vegetation. The exclusion of bison from grazing blocked public lands (amounting to 60 percent of the RMPPA) would eliminate the option of using bison in grazing prescriptions to manage the vegetation resource. Vegetation in the RMPPA evolved with bison grazing.

Because cattle affect vegetation differently than bison, this exclusion would preclude restoring a component to native vegetation communities in order to maintain their naturalness.

Minerals management actions would result in similar impacts on vegetation as under Alternative 1, except that fewer acres of vegetation would be disturbed and the potential for weed invasion would be reduced as a result of decreases in oil and gas development. Oil and gas development would disturb 56,505 acres during the planning period, a 10-percent decrease compared with Alternative 1. Reclamation would restore roughly 41,016 acres in the short term to ensure site stability and reestablishment of the native plant community.

Limiting OHV travel for retrieving big game kills and camping to designated roads and vehicle routes would reduce disturbance from OHV use to these areas, thereby protecting them from vegetation damage by OHV use. Areas closed to OHV use would increase to 71,980 acres (about three times more than in Alternative 1), which would protect vegetation from trampling and other disturbance due to OHV activities. The use of designated roads and vehicle routes would result in closure (and reclamation) or road maintenance of existing roads in poor locations, which would eliminate or minimize degradation of vegetation in these areas.

SD/MAs such as ACECs, NNLs, and WSAs would in most cases protect and enhance vegetation resources. Some of these SD/MAs, such as Blowout Penstemon ACEC, Sand Hills ACEC, and Chain Lakes WHMA, were identified for protection because of rare plants and unique plant communities. There would be less surface disturbance as a result of more restrictive management for many of the existing and proposed SD/MAs. For example, all the river segments (140 miles) would be managed as suitable for eligibility in the National Wild and Scenic Rivers System. (See impacts described under Alternative 1; protection measures would be similar). Additional protection for these WSRs would include closing these areas (1/4 mile from stream) to OHV use and oil and gas leasing, and would be recommended for withdrawal from mineral entry. Increased protection of vegetation resources would result from restrictions placed on surface disturbing activities, because a greater amount of land area would be subject to NSO requirements, closed to oil and gas development, closed to locatable mineral entry, and have limited OHV use. Management actions that limit the extent of surface disturbing activities would minimize direct effects on vegetation from trampling, disturbance, or loss of plants, as well as indirect effects resulting from erosion, sediment loading to waterways, compaction of soils, and loss of soil productivity. The effect of these actions would maintain or enhance vegetation resource values.

The Historic Trails ACEC contains contributing segments that would restrict surface disturbance within 1/4 mile of the trail under this alternative. The Overland Trail follows Muddy Creek for about 10–15 miles and crosses the creek periodically. Restricting surface disturbance in this portion of the Historic Trails ACEC would protect the federal sections of the contributing portions of the trail from trampling, disturbance, and/or loss of vegetation resulting from construction of roads, well pads, and other facilities.

Special management for the Muddy Creek watershed would result in avoidance of surface disturbing activities within 1/4 mile of ephemeral and perennial streams that protect and maintain native vegetation. Impoundments and instream structures would be removed or modified where negative effects would occur on habitat quality, habitat quantity, or the life history requirements of populations of Special Status Fish Species. This action would result in disturbance of soils and vegetation and short-term increases in sediment loads by increasing stream channel length to maintain low gradients and prevent head cutting and loss or degradation of riparian habitat values. Surface disturbing activities in some aspen and mountain shrub communities would be prohibited or avoided to eliminate disturbance to or loss of these plant communities. Management actions would enhance the health of these communities and the habitat values they provide for wildlife species.

Special management for the Encampment River Potential WSR would provide some additional protection for watershed health, including avoidance or minimizing disturbance of vegetation, particularly if Congress releases the WSA from wilderness consideration. Management actions for the Blowout Penstemon ACEC would protect and enhance existing and potential habitat, which would maintain or increase populations of this endangered plant species. Surface disturbing activities would be prohibited and plant species which are determined to compete with or alter the habitat supporting Blowout Penstemon would be removed or controlled.

Vegetation management would result in upland and riparian habitats being managed to meet DPC objectives. This effort would create a landscape mosaic consisting of early-, mid-, and late-seral stage communities, with a mixture of herbaceous and multi-aged woody species, characterized by increased vegetation production and diversity. Vegetation treatments would occur on an average of 11,800 acres per year with an emphasis on numerous smaller areas of treatment. The fivefold increase in vegetation treatments would create a more diverse mixture of species and age class, and better mosaics of treated and untreated areas. However, seral conditions would have a higher proportion of late seral than desired. To achieve the mosaic of smaller treatment areas, additional surface disturbance would be required for fire perimeter control or burn prescriptions would be implemented with lower wind speeds, which potentially would increase mortality of fire-sensitive species.

Weed control treatments would occur on 28,542 acres per year, which would reduce and control weed infestation, where treatments are applied in the long term. The goals for treatment would be to maintain weed-free, native communities to maintain their natural values. Areas with established noxious and invasive weed patches would be treated to contain weeds, which would protect adjacent native plant communities from invasion. The fivefold increase of vegetation treatments would create more surface disturbance from fire perimeter control, slightly increasing the opportunity for establishment of noxious and invasive species. This would also increase the acreage of healthy vegetation communities which are more resistant to the establishment of invasive species.

Impacts from water quality, watershed, and soils management would be similar to Alternative 1 for avoidance areas and watershed protection, except for management prescriptions for surface discharge of produced water, large water impoundments in the Muddy Creek watershed, and management prescriptions for the Encampment watershed.

Surface discharge of produced water from Federal leases would not be allowed in the Colorado River Basin and would be restricted to only the amounts and types of surface discharge that would meet BLM land management objectives (including those for vegetation management). Restrictions on surface discharges when they occur in the Great Divide and Platte Basins would allow the BLM to specify the amount and timing of these actions. This would limit surface discharge to only those areas, times, and amounts that would likely benefit vegetation communities. Infiltration/evaporation reservoirs would not be allowed in most cases, thus avoiding the disturbance to upland and riparian vegetation.

Water impoundments in the Muddy Creek Watershed (Map 2-20) that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. This would prevent the direct loss of vegetation from the construction and inundation of large water projects. This also would indirectly maintain existing riparian vegetation downstream of proposed projects that meet the criteria above and would alter natural hydrologic flows. Riparian and wetland plant communities and the mosaic of aquatic and upland habitats potentially created by large water impoundments would not occur.

Management actions for the Encampment River Watershed and protection of municipal water supplies downstream would restrict surface disturbing activities such as permanent roads or structures and reduce disturbance to vegetation. It would also promote livestock grazing management and forest management

actions to meet watershed objectives. This would result in vegetation communities characterized by improved plant litter, density, and cover.

Increased wild horse AML numbers (from 70 to 165 adults) in the Lost Creek HMA would heighten the need for special management of limited desert riparian habitats in this area. This management would be achieved through the use of exclosures, offsite water development, and/or riparian pastures to maintain riparian management objectives. Utilization of grasses, the principle component of wild horse diets, would increase in proximity to water sources and areas where wild horse, cattle, and/or elk use occurs in herd concentration areas.

Impacts from wildlife management actions would alter vegetation management strategies to achieve DPC specific to the needs of individual or communities of wildlife species using the same vegetation types. Increased restrictions for sensitive habitats (such as NSO on grouse leks, expanded distance from raptor nests) would influence the size, location, and timing, but would not preclude vegetation treatment projects.

Managing important waterfowl areas for preferred waterfowl habitat would improve vegetation cover and diversity. Prohibiting water development in big game crucial winter range would reduce flexibility to manage livestock distribution and use of herbaceous vegetation, which would potentially increase grass dominance on shrub rangelands. However, in locations where all management actions promote reduced browse use of desirable shrubs during the growing season, crucial winter range vegetation would improve in vigor and cover.

Summary

Vegetation management actions would meet DPC objectives in addition to achieving Standards for Healthy Rangelands (USDI, BLM 1997). Vegetation treatments would occur on an average of about 11,800 acres per year, with an emphasis on smaller and more numerous projects. This would be a fivefold increase in vegetation disturbance that would increase the proportion of early- and mid-seral plant communities to late-seral plant communities. This would result in vigorous, diverse, and productive plant communities, but would also increase opportunities for weed invasion and expansion.

There would be the potential for surface disturbing activities on 56,505 acres of BLM administered lands (2,828 acres per year; a 10-percent disturbance decrease from Alternative 2) as a result of minerals management actions. There also would be surface disturbance associated with lands and realty (5,546 acres) and livestock related management actions (420 acres). Approximately 44,029 acres associated with these surface disturbances would be reclaimed which would potentially return native vegetative cover to most of these areas. Acres affected by wildland fire would increase (10,000 acres per year). There would be less fire suppression in an effort to utilize natural wildland fire as a resource management tool to assist in the rejuvenation of shrub and grasslands as well as other fire dependant species such as aspen. This would reduce the amount of surface disturbance commonly associated with using heavy equipment for fire suppression. However, even with the reduction in surface disturbance acreage under this alternative, there still remains a strong potential for weed species invasion within these areas. Wind energy exclusion areas would increase to 384,030 acres with an additional 497,080 acres closed to other utility/transportation systems. An estimated total of 271,110 acres of land withdrawn from locatable mineral entry or operation of the public land laws would help protect vegetation from potential surface disturbing activities.

Weed treatments (28,542 acres annually) would keep up with the introduction of, and attempt to control the proliferation of, noxious and invasive weeds in the long term.

There would be no significant impacts to Special Status Plants or unique plant communities.

4.15.5 Impacts Under Alternative 4: Proposed Plan

Management of air quality and VRM would have little or no impact on vegetation resources.

Impacts from paleontology, and transportation and access management would be the same as under Alternative 1.

Impacts from cultural resource management would be the same as those identified in Alternative 3.

Wildland fire management actions would be similar to those under Alternative 1, except wildland fires would increase twofold (8,000 acres per year), resulting in an overall shift in plant communities to more early and mid-seral conditions and increased opportunities for weed invasion and expansion.

Forest management actions, such as eliminating commercial timber harvest on 6,700 acres of land on steep slopes, riparian areas, and associated buffer zones, would maintain soil stability and vegetation species on these areas. Impacts to other upland areas would be similar to those described in Alternative 1.

Impacts from lands and realty would be the same as under Alternative 1, except 46,690 fewer acres would be proposed for withdrawal, which would increase the amount of land available for disposal and mineral location or entry, and thereby increase the potential for disturbance of plant species and communities.

Impacts from livestock grazing management on vegetation would be similar to that described in Alternative 3, except range improvements would be the same as described in Alternative 1.

Minerals management actions would result in similar impacts on vegetation as under Alternative 1, except that fewer acres of vegetation would be disturbed and the potential for weed invasion would be reduced as a result of decreases in oil and gas development. Approximately 57,819 acres of disturbance would occur during the planning period; a 7-percent decrease compared with Alternative 1. Reclamation would restore approximately 42,347 acres in the short term to ensure site stability and reestablishment of the native plant community.

Limiting OHV travel for retrieving big game kills and camping within 300 feet of existing roads and vehicle routes would reduce disturbance to these areas, thereby limiting potential vegetation damage by OHVs. Areas closed to OHV use would increase to 46,370 acres (about 50 percent more than in Alternative 1), which would protect vegetation from trampling and other disturbance due to OHV activities. The use of designated roads and vehicle routes would result in closure (and reclamation) or road maintenance of existing roads in poor locations, which would eliminate or minimize degradation of vegetation in these areas.

Impacts from management of SRMAs would be similar to Alternative 1, except the establishment of an OHV SRMA would result in trampling, disturbance, and removal of vegetation.

SD/MAs such as ACECs, NNLs, and WSAs would in most cases protect and enhance vegetation resources. Some of these SD/MAs, such as Blowout Penstemon ACEC, Sand Hills ACEC, and Chain Lakes WHMA, were identified for protection due to rare plants and unique plant communities. SD/MA impacts would be similar to those of Alternative 1, except there would be less opportunity for surface disturbance as a result of more restrictive management for many of the existing and proposed SD/MAs. Alternative 4 would provide protection to vegetation resources from surface disturbing activities, which cause trampling, disturbance, and loss of vegetation because of the acres subject to NSO requirements,

closed to oil and gas development, closed to locatable mineral entry, and limited vehicle use. Surface disturbing activities in some aspen and mountain shrub communities would be avoided through mitigation measures to eliminate or minimize disturbance or loss of these plant communities. Management actions would enhance the health of these communities and the habitat values they provide for wildlife species.

Impacts from historic trail management would be the same as those described in Alternative 3.

Management actions for the Encampment River Watershed and protection of municipal water supplies downstream would restrict surface disturbing activities such as permanent roads or structures and reduce disturbance to vegetation. It would also promote livestock grazing management and forest management actions to meet watershed objectives that would result in vegetation communities characterized by improved plant litter, density, and cover.

Upland and riparian areas would be managed to meet DPC objectives. This effort would result in a landscape consisting of a mixture of early-, mid-, and late-seral stage communities with herbaceous and multi-aged woody species, more stable soils, and increased vegetation production and diversity. Vegetation treatments would occur on about 16,400 acres per year to achieve DPC objectives, but would also increase opportunities for weed invasion and expansion. Prescribed fire treatments would reintroduce fire into fire-dependent plant communities on a landscape scale from which fire has been absent. Reintroduction of fire would increase ecological diversity, vegetation structure, and age class distribution.

Priority would be placed on treating new and small infestations of noxious and invasive weeds, thereby controlling outbreaks before they become large and established. Areas of large infestations would be treated to control the rate of spread. Vegetation treatments would increase, which would create more opportunities for establishment of noxious and invasive species. Weed treatments would occur at a pace (25,000 acres annually) that would in the long term keep up with the introduction of, and attempt to control the proliferation of, noxious and invasive weeds. In the short term, some infested acreage would continue to decline in plant diversity and productivity, and provide a seed source for further weed expansion into native rangelands. However, in the long term, treatments would slow the proliferation of existing weed species and the introduction of new weed species into new areas, until all areas received treatments.

Impacts from watershed, water quality, and soils would be similar as under Alternative 1, except that the Encampment River Watershed the impacts would be the same as Alternative 3.

Impacts from wild horse management on vegetation would be similar to that described in Alternative 1, except adjusting the number of wild horses in the Lost Creek HMA would be based on the need to preserve the New World Iberian genotype, and would potentially increase the affect wild horses have on vegetation.

Impacts from wildlife management actions would be similar to those described under Alternative 1 in terms of timing and distance restrictions for surface disturbing activities. In addition, impacts would be the same as described under Alternative 3 for altering vegetation management strategies to achieve DPC specific to the needs of fish and wildlife species.

Summary

Vegetation management would meet DPC objectives in addition to achieving Standards for Healthy Rangelands (USDI, BLM 1997). Vegetation treatments would occur on about 16,400 acres per year. This would be a sixfold increase in vegetation disturbance, which would increase the proportion of early- and mid-seral plant communities to late-seral plant communities. This effort would result in vigorous, diverse,

and productive plant communities, but would also increase opportunities for weed invasion and expansion. Use of wildland fire for resource benefit would reintroduce fire into fire-dependent plant communities on a landscape scale from which they have been long absent.

The disturbance of 57,819 acres of vegetation (2,890 acres per year; a 7-percent decrease) from minerals management actions, 7,680 acres from lands and realty management actions, and 900 acres from livestock management actions would be susceptible to weed invasion. Approximately 42,207 acres of this disturbance would be reclaimed, which would return vegetation cover and forage production to most of this acreage. Acres affected by wildland fire would double (8,000 acres per year) and suppression efforts would continue to create opportunities for weed invasion and expansion. Utility/transportation systems and wind energy development and associated disturbance to vegetation would increase, and be excluded from 98,440 acres, with avoidance measures implemented on another 634,650 acres. Estimated total withdrawals would help protect vegetation on 16,980 acres.

Significant impacts to weed management are unlikely because most of the actions are designed to preserve and protect vegetation resources. However, 5,000 to 7,000 acres of existing weed patches would remain untreated, which would not completely slow the proliferation of weeds. Treatments would occur on a scale (25,000 acres annually) that in the long term would control the introduction of, and mostly control the proliferation of, noxious and invasive weeds.

There would be no significant impacts to Special Status Plants or unique plant communities.

4.16 VISUAL RESOURCES

VRM provides management decisions that direct how the visual quality of the RMPPA will be maintained. This section presents potential impacts to VRM from implementation of management actions for other resource programs. Impacts from the implementation of VRM management prescriptions on other resources and resource users are discussed under those particular resource headings.

Significance Criteria

Impacts to visual resources would be considered significant if the following were to occur:

- An activity or development in an area is incompatible with the designated VRM class objective and becomes an unacceptable feature of the landscape or visual horizon.
- Surface disturbance, development or other visual intrusions are so dominant on the landscape that they overwhelm the casual observer, regardless of the VRM Class, to the point that he would not want to return to the area.

Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of resources and the project area, review of existing literature, spatial analysis using ESRI's ArcGIS Desktop 9.1 computer software, and information provided by other agencies. Effects are quantified where possible. See 3.16.1.2 for a description of VRM Management Classes. Maps 2-49 through 2-52 present VRM classes; Table 2-9 presents acreages for each VRM class under each alternative. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- A management action for a program or resource will have an effect on visual resources if that action does not conform to the designated VRM class.
- Even in VRM Class IV areas, a management action for a program or resource will have an effect on visual resources if it is so dominant on the landscape that it overwhelms the casual observer to the point that he would not want to return to the area.
- The checkerboard land pattern along the original U.P.R.R. ROW is not conducive to Class II VRM because BLM has no control over private surface. BLM will mitigate developments on BLM surface in the Class II checkerboard as best it can and encourage proponents to apply comparable mitigation to adjacent private surface.
- Conflicts will continue to occur in the Seminoe VRM Class II area between oil and gas exploration and extraction, the Seminoe-to-Alcova Back Country Byway, and the checkerboard land pattern.
- RFDs and RFAs can be found in Appendix 33.

4.16.1 Impacts Common to All Alternatives

No impacts would be expected from air quality and paleontology management actions to visual resources.

Cultural resource management actions would benefit visual resources by intensively managing any surface disturbing activity that modifies the visual setting of historic properties where the setting contributes to NRHP eligibility.

Fire and fuels management would use wildland fire, prescribed fire, and mechanical, chemical and biological treatments for fuels reduction and to meet other multi-resource objectives, including returning fire to its natural role in the ecosystem. Rehabilitation and restoration efforts specific to a fire event would be undertaken to protect and sustain ecosystems when needed. Fire suppression and fuel treatments within the VRM Class I and II would potentially detract from the existing visual elements of form, line, color, and texture. Impacts would typically be short term, depending on the spatial arrangement, vegetation mosaics, and proximity to key observation points. Visual impacts from dead, standing, and down woody material resulting from wildland fire or prescribed burns would be short- to mid-term in duration, depending on factors such as the intensity and extent of a given burn, the rate of decay of the dead material, and the size and density of vegetation burned. In the long term, fuel treatments would improve visual resource qualities by eliminating decadent stands and rejuvenating vegetation.

Forest management would potentially impact visual resources where noncommercial harvest of minor wood products would occur. Some of these noncommercial harvests would potentially occur in VRM Class II areas, but the acreage would be small and locations of harvest would not be readily visible from key observation points, so visual impacts are anticipated to be minor and short term.

Lands and realty-authorized surface disturbance associated with the construction of facilities and ROWs would impact visual resources. The clearing and grading of land associated with new construction and the establishment of ROWs would remove vegetation, which would alter the character of the visual landscape. Below-ground utilities and some above-ground facilities would be compatible with VRM Class II if properly mitigated using BMPs (Appendix 15). Management actions involving surface disturbance and construction of facilities could be approved within Class II designations with adequate mitigation, so long as they did not exceed the VRM Class II management objectives. Nonfederal lands acquired in visually sensitive areas, such as WSAs and WSRs, would help protect the visual settings in these SD/MAs. Avoidance areas include VRM Class I and II areas which would preserve the visual character of these areas.

Development activities associated with lands and realty actions would include wind energy development, utility/transportation systems development, and communication site development. Areas with important resources, such as existing and proposed recreation sites and SD/MAs, which contain important supplemental recreational values, would be avoided to reduce the impacts of these types of developments where possible. Developments would alter the typical Class II and Class III visual settings in the RMPPA by creating highly contrasting elements to the existing settings that would potentially have a significant impact on visual resources. The characteristics of and the amount of the developments would create a large footprint not only in the localized affected areas, but in a landscape setting as well. It would significantly detract from the typical visual settings in the RMPPA by creating linear and focal visual intrusions on the horizon, which would alter the scenic qualities associated with a middle country setting to an industrial setting.

Management of all programs to meet Wyoming Standards for Healthy Rangelands would help retain and improve the visual quality of lands in the RMPPA.

Oil and gas development and production facilities would be compatible with VRM Class IV objectives, which allow for major modifications of the existing character of the landscape. The visual settings of some areas managed as VRM Class IV currently consist of back to middle country settings with a high degree of naturally contrasting elements, creating scenic landscapes. Oil and gas development in these

areas would introduce highly contrasting elements of form, line, color, and texture, which would alter the natural settings to an industrial setting.

Adequate visual mitigation in the form of BMPs and conditions of approvals would allow oil and gas development to be compatible with VRM Class III. Visual resource management actions would allow oil and gas development to be considered in VRM Class II. Developments in Class II areas would be mitigated so as to retain the scenic quality and not attract the attention of the casual observer. Developments would not occur in VRM Class I areas, which are managed under the WSA IMP. However, development activities would potentially exceed these prescribed levels in order to better effectively extract resources, which would constitute a significant impact to visual resources.

Facilities and roads constructed for mineral development would impact visual resources in VRM Class II, III, and IV areas. Short-term effects include dust and emissions from vehicles and facilities that contribute to air pollution and haze in the region. The addition of structures, particularly wells, tanks and power lines, to the landscape would have long-term impacts on the visual quality of the landscape. The visual effect of structures would be localized and would affect only observers inside the viewsheds, except where facilities are located on ridgelines. Facilities placed on ridgelines would have a greater propensity to degrade multiple viewsheds because the structure extends above the horizon. Development activities would alter the character of the landscape by introducing contrasting elements against the natural landscape, which would be visually distracting to the causal observer. This would alter the landscape from a predominantly natural setting to a more industrialized setting.

There is low to moderate potential for locatable minerals. A notice is required for any disturbance of 5 acres or less; a Plan of Operations is required for any disturbance of 5 acres or more. Both a notice and a plan require that a reclamation bond be posted with BLM and the State of Wyoming Department of Environmental Quality. Reclamation of any disturbance is required. Mineral material disposal is discretionary. Any request would be individually evaluated. If the potential action is deemed incompatible with management objectives for the area, it would be denied.

OHV management actions would allow motorized use off of existing roads and vehicle routes for “necessary tasks” except in WSAs and specific SD/MAs (Table 2-1). OHV use off of existing roads and vehicle routes would allow the proliferation of primitive routes that would create contrasting linear features with the existing visual elements of the landscapes, introducing elements that would distract the casual observer from the natural landscape

Paleontological discoveries would potentially be protected by actions such as fencing, signing, physical barriers or other methods of restricting access. Acreage within these areas would be minimal and localized at a management scale which would be a negligible impact to visual resource management objectives.

Recreation Resource management actions would maintain or improve the existing recreation sites and maintain dispersed recreation throughout the RMPPA to the recreating public. An increase in dispersed recreational use in popular destination areas would potentially impact the scenic quality of these areas, in which management actions would mitigate the resource damage. Impacts to visual resources from recreation resources management actions would be minimal.

The special protections and enhancements associated with SD/MAs would maintain or enhance the visual settings and the scenic qualities. WSAs are managed as VRM Class I. The Interim Management Policy for Lands Under Wilderness Review assures that the quality of the visual resources within the WSAs is retained or improved as long as they remain WSAs. Direction under the IMP would have negligible impacts to visual resources.

Transportation and access management would maintain an adequate road network across the RMPPA. Any development of the transportation network within the RMPPA would potentially alter visual resources. Road closures and restricted access would enhance the visual settings of the area by removing contrasting linear elements from the natural landscape. Impacts from transportation and access management would have little to no impacts on visual resources.

Vegetation management would maintain, restore, and enhance vegetation communities by minimizing disturbance to vegetation through application of BMPs and reclamation practices and managing riparian, wetland, and upland vegetation to meet the Wyoming Standards for Healthy Rangelands and use of all forms of control for noxious and invasive species on a case-by-case basis. These actions would contribute to the natural appearance of the landscape and therefore enhance the visual character of the landscape.

Visual resource management activities would have direct impacts to the scenic qualities of the natural landscapes. Visual resource management classifications determine the allowable level of visual impact in specific areas while maintaining the effectiveness of land-use allocations for activities based on other resources. Limitations on visual intrusions in Class I and II VRM areas are intended to retain or improve the quality of visual resources, whereas Class III and IV would allow more visual contrasts associated with development and resource management activities. Management actions would allow development activities within the Class IV areas to impact the scenic qualities of the natural landscapes to the degree of changing the natural settings to an industrialized setting. VRM classes within the RMPPA are depicted in Map 2-51.

Water quality, watershed, and soils management requires intensive management of surface disturbing activities in specific watersheds, which reduces visual impacts in these areas. Surface disturbing activities would be avoided in the following areas: (1) identified 100-year floodplains; (2) areas within 500 feet from perennial waters, springs, and wetland/riparian areas; and (3) areas 100 feet from the inner gorge of ephemeral channels. Functionally compromised reservoirs would be reclaimed or rehabilitated. These actions would prevent or reduce visual impacts in localized areas.

Wild horses management would have little to no impacts to visual resource management.

Wildlife and fisheries management actions would require intensive management of surface disturbing and disruptive activities. Intensive management through the use of BMPs in RCAs, facility placement, and minimization of construction disturbance to maintain connectivity between large contiguous blocks of undisturbed habitat would maintain or minimize the impacts to existing visual elements, which would maintain or preserve the scenic values and visual settings.

4.16.2 Impact Under Alternative 1: Continuation of Existing Management

Air quality, paleontology and wild horses would have little or no impact on VRM.

Cultural resource management would create an avoidance area for surface disturbing and disruptive activities within 1/4 mile of a cultural property or the visual horizon, whichever is closer, where the setting contributes to NRHP eligibility. This would preserve the visual integrity of the immediate area around these sites.

Fire and fuels management would use wildland fire, prescribed fire, and mechanical, chemical and biological treatments for fuels reduction and to meet other multi-resource objectives, including returning fire to its natural role in the ecosystem. Rehabilitation and restoration efforts specific to a fire event would be undertaken to protect and sustain ecosystems when needed. Fire suppression and fuel treatments within

the VRM Class I and II would potentially detract from the existing visual elements of form, line, color, and texture. Impacts would typically be short term, depending on the spatial arrangement, vegetation mosaics, and proximity to key observation points. Visual impacts from dead, standing, and down woody material resulting from wildland fire or prescribed burns would be short- to mid-term in duration, depending on factors such as the intensity and extent of a given burn, the rate of decay of the dead material, and the size and density of vegetation burned. In the long term, fuel treatments would improve visual resource qualities by eliminating decadent stands and rejuvenating vegetation.

Forestry would use a full range of methods to manage forest health. Timber harvesting (approximately 28,500 acres would be available for commercial timber harvest located on Shirley Mountain) would have short-term visual impacts from slash piles, temporarily improved roads, and clear-cutting until revegetation is sufficient to make the area blend with the surrounding landscape. The enhanced regrowth of forests encouraged by good forest management would improve the quality of visual resources.

Access acquisitions and land tenure adjustments through exchange would potentially create larger blocks of public land which would make visual resource management more effective because inholdings would not be subject to unmitigated development. This action, combined with the establishment of ROW avoidance areas and exclusion areas where new linear visual intrusions would not be likely to occur, or would at least be intensively managed, would enhance protection of visual resources in these areas.

Surface disturbances associated with the construction of facilities and ROWs for pipelines, transmission lines, communication lines, and other developments would impact visual resources in both the short and long term. Surface disturbance associated with new construction and the establishment of associated ROWs would introduce contrasting visual elements which would alter the character of the landscape and impact visual resources. Development of above-ground and below-ground linear facilities and access roads within VRM Class III and Class IV areas would create long-term but allowable visual impacts.

Development of rangeland projects and livestock grazing practices would cause localized direct and indirect visual impacts. Stock fencing, increased levels of livestock grazing, and other maintenance and development of range improvements would alter existing localized landscapes.

Facilities and roads constructed for mineral development would impact visual resources in VRM Class II, III, and IV areas. Oil and gas development facilities to the landscape would introduce highly contrasting elements of form, line, color, and texture against the surrounding landscape, which would impact the scenic qualities as well as alter the landscape from a natural setting to an industrialized setting. Most of the development would occur in VRM Class III and IV areas, which allow for moderate to high levels of change to the characteristics of the landscape. Oil and gas development in localized areas would potentially exceed the levels of change to the characteristics for the landscape than prescribed in the designated VRM Class.

857,040 acres would be open to leasing with only standard stipulations. Mineral development in areas of high and moderate oil and gas potential, where most development is expected to occur, would be most heavily impacted by visual intrusions. Under this alternative, 185,130 acres would be available for lease under stipulations such as NSO, 65,600 acres would be closed to leasing, and 63,670 acres would be closed to locatable mineral entry, each of which would help protect visual resources from the impacts discussed in Common to All. VRM management actions would mitigate visual intrusions applied in the form of BMPs and condition of approvals which would decrease the visual impacts.

OHV management actions would allow motorized use off of existing roads and vehicle routes to retrieve big game kills and to access camp sites, except in WSAs, river segments eligible for WSR tentatively classed as “wild,” and the High Savery Dam and Reservoir, where it would be prohibited. This would

potentially allow the proliferation of primitive routes that would create contrasting linear features with the existing visual elements of the landscapes.

The Dune Ponds CMA (Map 2-5) would be the only open OHV area where cross-country travel is permitted. Vehicles would be allowed to travel cross-county on non-vegetated portions of the dunes. Travel would be limited to existing roads and vehicle routes on vegetated portions of the CMA. The shifting sands naturally cover the OHV tracks on the unvegetated portions, which eliminates visual impacts in the CMA.

Recreation Resource management actions would create an NSO stipulation within recreation sites. Surface disturbance would be intensively managed within the 1/4 mile surrounding these sites in an attempt to minimize undesirable visual impacts at the sites. Developed recreation sites would also be closed to locatable mineral entry, mineral material disposals, and operation of the public land laws, all of which further protect the visual integrity of the sites. An increase in dispersed recreational use in popular destination areas would potentially impact the scenic quality of these areas, which would be mitigated through recreation management actions. Impacts to visual resources from recreation resources management actions would be minimal.

The Shirley Mountain SRMA and the Cave Creek Cave area management actions would allow timber harvests, which would create contrasting elements of form, line, color, and texture against the natural landscape. However, a 500-foot buffer restriction to protect perennial waters, springs, and wetland/riparian areas would act to preserve habitats for various fish and wildlife species. This would limit the amount of visual contrasts against the landscape.

Continental Divide National Scenic Trail SRMA management actions would allow public lands to be open for locatable mineral entry and mineral material disposal and to the operation of the public land laws. These actions would allow localized surface disturbance activities within the viewshed which would create visual distractions to the casual observer. Visual resource management mitigation in the form of BMPs or conditions of approvals would ensure the activities would meet the prescribed visual resource management objective.

The North Platte River SRMA actions would open a 1/4-mile area on either side of the river to locatable mineral entry and mineral material disposals, with associated surface disturbing and disruptive activities restricted, and intensively manage any other surface disturbance activities 1/4 mile on either side of the river so as to retain the quality of the visual resource. These actions would preserve the visual quality and the recreational settings, which would benefit visual resources. There would be few to no impacts to visual resources from the SRMA management actions.

Jelm Mountain, Pedro Mountain, Laramie Plains Lakes, and Rawlins Fishing areas would not be designated as SRMAs. However, management actions for both areas would allow oil and gas leasing with intensive management of surface disturbing and disruptive activities, which would be mitigated to preserve the scenic qualities. The actions would allow public lands open to locatable mineral entry, mineral material disposal, and operation of the public land laws. These actions would create localized visual distractions, but would be managed so as to meet the prescribed visual resource management objectives. There would be few to no impacts to visual resources from these actions.

WSAs are managed as VRM Class I areas according to BLM policy (Instruction Memorandum No. 2000-096). Interim Management Policy for WSAs provides for only temporary uses and limits surface disturbing activities to accommodating valid existing rights. This policy, together with the VRM Class I objective, would ensure the preservation of the wilderness characteristics and visual quality of the WSAs.

The restrictive management actions from most SD/MAs would have minimal to no impacts to visual resource management objectives. SD/MA actions would allow off-road OHV use for "necessary tasks" for most SD/MAs, as well as allow off-road OHV use for big game retrieval and campsite access in only a few SD/MAs. This action would create primitive roads and vehicle routes, which would introduce contrasting linear features against the natural landscape. Most SD/MAs would be open to oil and gas leasing with intensive management to surface disturbing activities, which would reduce visual impacts to the surrounding landscape. Pennock Mountain WHMA (7,770 acres), Laramie Plains Lakes WHMA (1,600 acres), and Blowout Penstemon area (17,060 acres) would actively pursue land tenure adjustments including acquisition of lands, easements, or exchange to meet multiple-use management objectives. This action would potentially create larger blocks of public land, which would make visual resource management more effective because former inholdings would not be subject to unmitigated development. Upper Muddy Creek Watershed/Grizzly WHMA (26,850 acres) and the White-Tailed Prairie Dog areas would provide additional spatial restrictions regarding surface disturbing and disruptive activities. This would potentially place facilities in areas where the development activities are no longer subordinate to the surrounding landscape, which would create a visual distraction to the casual observer.

The 140 miles of river segments deemed eligible for inclusion in the Wild and Scenic River system would be protected from new human intrusions in order to retain the quality of their visual and recreational settings until suitability determinations are made. Eligible river segments tentatively classified as "wild" would be managed as a VRM Class I, which would include the Encampment River, Skull Creek, and Duck Creek. However, the Encampment River and Skull Creek river segments are located within WSAs and are managed as a Class I. The Duck Creek river segment would introduce an additional 506 acres to be managed as Class I.

Transportation and Access Management would not consider road densities during the analysis process of surface disturbing and disruptive activities, which would potentially be detrimental to visual resources by allowing road proliferation, create visual intrusions and erosion, and generally alter the linear visual component of an area without limitation.

Vegetative manipulation, using mechanical, chemical, biological and prescribed fire methods, would create a short-term, unnatural appearance against the landscape. Visual impacts would be greatest if the spatial arrangement, vegetation mosaics, and proximity to key observation points drew attention to the treated area. Management of vegetation through prescribed burns would often improve range conditions and wildlife habitat in the long term, both of which would enhance the quality of visual resources.

Mitigation for the designated VRM Classes would prevent significant impacts (Appendix 25 for VRM Class objectives), except where facilities are densely located to prevent them from dominating the landscape, which would create visual distractions from the natural landscapes. VRM classes within the RMPPA are depicted in Table 2-9 and Map 2-51. The checkerboard land pattern along the original U.P.R.R. ROW is not conducive to VRM Class II due to lack of visual mitigation control over adjacent private surface where development would potentially impair visual qualities. The majority of the checkerboard land pattern would be managed as Class III, which would allow development activities to be noticed, but not dominate the landscape.

Management actions for water quality, watershed, and soils resources would impact visual resources because these actions generally limit the extent of surface disturbing activities or vegetation removal, which would help prevent degradation of the viewshed. Properly mitigated water development projects in VRM Class II areas would result in relatively minor changes to the landscape and would not likely attract the attention of the casual observer.

Wildlife actions that improve habitat, such as meeting Standards for Healthy Rangelands (Appendix 8 and 26), would improve the natural appearance of the visual setting. In the short term, results from the wildlife actions, such as fire lines created during prescribed burns, would introduce contrasting elements with the existing elements, which would affect visual resources. However, long-term impacts would maintain or enhance the visual quality of the landscape in localized areas. Spatial and temporal restrictions regarding surface disturbing and disruptive activities would potentially place facilities in areas where the development activities are no longer subordinate to the surrounding landscape, which would create a visual distraction to the casual observer.

Summary

Individual programs would have minimal impacts on visual resources, with the exception of minerals, lands and realty, and visual resources.

Oil and gas and wind energy developments would create large areas with contrasting visual elements of form, line, color, and texture against the natural landscape, which would alter the existing visual qualities. ROWs, utility corridors, pipelines and other linear features, and also detract from the visual quality of the setting. Most visual impacts from development would be mitigated and limited to levels appropriate for the designated VRM classes. However, energy development would exceed these prescribed levels, which would alter the natural landscape setting into an industrial setting. This would be a significant impact to visual resources. The checkerboard land pattern along the original U.P.R.R. ROW is difficult to manage as VRM Class II because visual mitigation would not apply to adjacent private surface where development would potentially impair visual qualities.

4.16.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, paleontology, and wild horses would have little to no impacts on VRM.

Impacts on fire and fuels, visual resources from cultural resources, forestry, livestock grazing, OHV management, most SD/MAs, transportation and access management, water quality, and watershed, and soils management would be similar to those identified in Alternative 1.

Impacts from lands and realty management action would be similar to those identified in Alternative 1, except that utility/transportation avoidance areas would not cover as much acreage as in Alternative 1. ROW corridors would potentially be created through the avoidance areas. The addition of new corridors would change the visual character of the affected areas by altering access patterns and creating visual intrusions.

Minerals impacts would be similar to those of Alternative 1, except that the magnitude of impacts from oil and gas development would be increased because 92,950 fewer acres would have stipulations, such as NSO, and more than 500,000 additional acres would be open to leasing. This would potentially mean a great deal more visual degradation in the RMPPA if the additional lands open to leasing were developed (see minerals impact discussion in Common to All above). The reduction in stipulations on 85,000 acres would also potentially result in the loss of wildlife-related habitat protections that would also have helped protect visual resources.

The North Platte River would not be managed as an SRMA to provide high-quality recreational opportunities along the river corridor. Only standard mitigation measures would be used to manage surface disturbing activities on BLM lands within 1/4 mile of the river. This potential new surface disturbance would detract from the visual quality of the river corridor.

Impacts to visual resources for the North Platte River area actions would be similar as those identified in Alternative 1, except that surface disturbing activities on public lands within 1/4 mile on either side of the river would be managed using standard mitigation measures (Appendix 1). This action would provide for less visual mitigation as compared to Alternative 1. However, VRM management mitigation measures in the form of BMPs or conditions of approvals will be applied to surface disturbing activities so as to maintain the prescribed VRM class objectives.

OHV SRMAs would be developed when needs are identified to promote educational programs in cooperation with partners on riding ethics and regulations. This action would impact scenic qualities at a localized area by introducing linear elements to the natural landscape. However, establishing the location of the SRMA would consider existing resources to avoid conflicts and unnecessary impacts, so impacts to visual resources would be minimal.

Wilderness study area management actions would have the same impacts to visual resource management as described in Alternative 1.

The restrictive management actions from most SD/MAs would be the same as those described under Alternative 1. Como Bluff NNL (1,690 acres) would be open to oil and gas leasing without intensive management to surface disturbing activities, and the Stratton Sagebrush Steppe Research Area would be open to leasing without the NSO stipulation. Actions from development would not require additional mitigation measures that would increase visual impacts to the surrounding landscape. The Pennock Mountain WHMA (7,770 acres), Laramie Plains Lakes WHMA (1,600 acres), and Blowout Penstemon area (17,060 acres) would not actively pursue land tenure adjustments which would negatively influence visual resource management because inholdings would not be subject to mitigation. Surface disturbing and disruptive activities would be allowed within white-tailed prairie dog towns which would create a visual distraction to the casual observer. However, visual resource management would retain the opportunity to locate development activities and associated facilities to areas that would meet VRM management objectives.

The Cave Creek Cave area would be closed to locatable mineral entry, mineral material disposal and allow intensive management of timber harvest within 1/4 mile of the cave complex. These actions would maintain the visual quality of the natural landscape.

All eligible segments would be determined to be nonsuitable for inclusion in the National Wild and Scenic River system. All segments would be released from further consideration for WSR. No special protections would be afforded to these segments. This would allow for potential new visual intrusions in the 1/4-mile corridors on either side of these waterway segments.

Impacts to visual resources from vegetation management actions would be the same as those described in Alternative 1, except there would be a tenfold increase in the amount of acres treated using prescribed burn methods at a landscape scale. This action would introduce a greater amount of contrasting elements against the natural landscape, which would distract attention from the surrounding natural environment.

VRM Class II acreage would be reduced by 125,660 acres around the Pathfinder and Seminoe Reservoirs and would be eliminated in the Shirley Mountains and the checkerboard land ownership pattern due to lack of visual mitigation control over adjacent private surface where development would potentially impair visual qualities. The majority of the checkerboard land pattern and the Shirley Mountains would be managed as Class III, which would allow development activities to be noticed, but not dominate the landscape. VRM Class IV acreage would be increased by 224,150 acres, primarily in areas already visually impacted by development. This action would allow for more impacts to the scenic quality, which would alter the natural setting to an industrial setting.

Wildlife and fisheries would provide far less protection from development and disruptive activities to most species and associated habitat which would provide additional opportunities for visual resource management.

Summary

Impacts to VRM from fire and fuels management would be similar to those of Alternative 1, except that in the long term, because of suppression of all wildland fires, fewer acres would benefit from rejuvenation of vegetation as a result of beneficial wildland fire.

Minerals impacts would be similar to those of Alternative 1, except that the magnitude of impacts from oil and gas development would be increased, which would result in more visual degradation in the RMPPA.

Wildlife and fisheries would provide far less protection from development and disruptive activities to most species and associated habitat, which would provide additional opportunities for visual resource management.

Most development would be mitigated and limited to levels appropriate for the designated VRM classes. However, some types of development, such as coalbed natural gas, would exceed these prescribed levels in order to extract the resource. This would be a significant impact to visual resources.

A total of 125,680 acres of VRM Class II acreage would be converted to Class III around the Pathfinder and Seminoe Reservoirs, Shirley Mountains, and checkerboard land ownership pattern due to suitability and manageability issues.

4.16.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, paleontology and wild horses management would have no or negligible impacts on VRM.

Fire and fuels and water quality, watershed, and soils management would have impacts similar to those of Alternative 1.

Cultural resource management would prohibit surface disturbing activities within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. This action would provide protection from surface disturbance and would retain the visual quality in these areas.

Forestry actions would have positive impacts on visual resources because of improved forest health. Commercial timber harvest would not be permitted, which would eliminate temporary improved roads and reduce the proliferation of associated primitive roads or vehicle routes. Forest stands only influenced by natural processes would retain a complete range of age classes and would not have the visual scarring of new clear-cuts or commercial harvest roads, so they would appear more natural.

Lands and realty would provide more protection in this alternative than the others to visual resources in proximity to recreation resources, primarily because withdrawal areas from mineral leasing would include recreation sites (approximately 5,560 acres), historic sites (approximately 79,446 acres), and HMAs (approximately 130,086 acres). Exchange for nonfederal lands in SD/MAs would be considered to consolidate BLM land ownership within these areas, which would improve BLM’s ability to limit visual

intrusions on formerly private inholdings. Avoidance area acreage would be substantially larger than in other alternatives, which would help to retain the quality of visual resources in the RMPPA.

Impacts resulting from management of livestock grazing would be similar to those under Alternative 1, except grazing systems and range improvements would be implemented to enhance wildlife, watershed, and riparian values. These systems and improvements would improve water quality and wildlife habitat, which would improve visual resource quality.

Mineral development would have significantly less impact on visual resources under this Alternative because restrictions would reduce development, and far more acres would be subject to stipulations such as NSO or closed to mineral leasing. Only 473,200 acres would be open to oil and gas leasing with just standard stipulations (Oil and Gas Classification A). This is 258,670 acres less than Alternative 1 and 1,594,680 less than Alternative 2. Acreage with major constraints (Oil and Gas Classification C) would be increased by 202,620 acres more than Alternative 1 and 496,740 acres more than Alternative 2. More than 127,680 acres would be closed to leasing (Oil and Gas Classification D). This is a 61,560-acre increase over Alternative 1 and a 61,720-acre increase over Alternative 2. Far less visual impact would occur as a result of mineral management actions under this alternative. However, because of the magnitude of new oil and gas development projects, this would still constitute a significant impact because it would not only exceed management objectives for VRM Class III but also displace visitors.

OHV management actions that prohibit off-road travel for dispersed camping and big game retrieval would help protect visual resources from the linear intrusions of route proliferation.

Many recreation resources actions would benefit visual resources. The NSO stipulation and the closure to locatable mineral entry, mineral material disposal and operation of public land laws within 1/2 mile of the surrounding recreation sites would preserve the visual quality of their settings. Above-ground facilities would be avoided, which would help protect visual resources near the recreation sites.

The Continental Divide National Scenic Trail actions would close public lands to locatable mineral entry, mineral material disposal, and land tenure adjustments, including sales. These actions in combination with the NSO stipulation would benefit visual resources by precluding surface disturbance activities within the 1/4 mile surrounding the trail. Impacts to visual resource management would be negligible.

The North Platte River SRMA would be expanded from a 1/4-mile area on either side of the river to a 1/2-mile area. Management actions would limit OHV use to designated roads and vehicle routes, close the area to oil and gas leasing, intensively manage existing leases, and close the area to locatable mineral entry, mineral material disposals, and operation of the public land laws, including sales. These actions would maintain or enhance the scenic qualities of the natural landscapes. Impacts to visual resource management would be negligible.

Jelm Mountain, the Pedro Mountains, the Rawlins Fishing sites (Teton Reservoir and Rim Lake Recreation Sites), and the Laramie Plains Lakes (Lake Hattie Reservoir and Twin Buttes Lake) would be managed as SRMAs. Like most of the other SD/MAs in this alternative, these SRMAs would have NSO stipulations on new oil and gas leases and intensive management of existing oil and gas leases, and would be closed to locatable mineral entry, mineral material disposal and land tenure adjustments, resulting in a loss of public access. These actions would allow a higher level of visual management for these areas, which would preserve or improve the scenic quality.

SD/MA actions would not allow off-road OHV use for “necessary tasks,” big game retrieval and campsite access. These management actions would have little to no impacts to visual resource management

objectives. Additional SD/MA actions would further maintain or enhance the scenic qualities of the landscapes. These actions are as follows:

Como Bluffs ACEC, Sand Hills ACEC, Jep Canyon WHMA, and Shamrock Hills RCA actions would open the area to oil and gas leasing with an NSO stipulation on new leases, and intensive management on existing leases. The actions would also close the lands to locatable mineral entry and operation of public land laws, including sale, and mineral material disposals.

Sand Hills ACEC hills actions would authorize no new fences, and JO Ranch would be managed as a VRM Class II.

Sand Hills ACEC, Jep Canyon WHMA, Muddy Creek Watershed/Grizzly ACEC, and Cow Butte/Wild Cow WHMA actions would restrict or prohibit surface disturbance actives in aspen communities and mountain shrub to protect the vegetation complex.

Stratton Sagebrush Steppe Research ACEC, Chain Lakes ACEC, Wick-Beumee WHMA, Cave Creek Cave ACEC, Laramie Plains Lakes ACEC and Cow Butte/Wild Cow WHMA actions would close the areas to oil and gas leasing, with existing leases intensively managed.

Chain Lakes ACEC, Laramie Plains Lakes ACEC, Wick-Beumee WHMA, Red Rim-Daley ACEC, Pennock Mountain WHMA, Cave Creek Cave ACEC, Historic Trails ACEC, Blowout Penstemon ACEC, Upper Muddy Creek Watershed/Grizzly ACEC, Cow Butte/Wild Cow WHMA, and High Savory Dam ACEC actions would close the areas to locatable mineral entry and mineral material disposals.

Shirley Mountain SRMA and Historic Trails ACEC would be open to oil and gas leasing with an NSO stipulation. Existing leases would be intensively managed.

Cave Creek Cave ACEC, Historic Trails ACEC, White-Tailed Prairie Dog ACEC, and Upper Muddy Creek Watershed/Grizzly ACEC would be managed with additional spatial restrictions and avoidance areas, which would maintain the scenic qualities of the landscape.

Blowout Penstemon ACEC and White-Tailed Prairie Dog ACEC would pursue land tenure adjustments, including acquisition of lands, easements, or exchanges.

The closure of all 5 WSAs to motor vehicles would help assure that no new visual impacts occur that would impair the wilderness suitability of these areas. This would be 45,840 more acres closed to motorized access than in Alternatives 1 and 2. These closures would result in a total of 66,120 acres (all already WSAs) protected from linear intrusions associated with motorized access.

Off-road travel for “necessary tasks,” big game retrieval, and campsite access would be prohibited, and many of the SD/MAs and would have seasonal OHV closures. These actions would reduce the probability of route proliferation and result in the long-term enhancement of visual resources in localized portions of the RMPPA.

All 140 miles of nine eligible waterways would be determined to be and managed as suitable for inclusion in the Wild and Scenic River system. The WSR designation would protect the waterways from new human intrusions in order to retain the quality of their visual and recreational settings. Eligible river segments tentatively classified as “wild” would be managed as a VRM Class I, which would include the Encampment River, Skull Creek, and Duck Creek. However, the Encampment River and Skull Creek river segments are located within WSAs and are managed as Class I. The Duck Creek river segment

would introduce an additional 506 acres to be managed as Class I. This would enhance the primitive visual character of these river segments.

Transportation and access management actions limiting road densities to levels that do not diminish or adversely affect other resources or resource values would help prevent habitat fragmentation and unnecessary linear visual intrusions.

Impacts to visual resources from vegetation management actions would be the same as those described in Alternative 1, except there would be more than a fourfold increase in the amount of acres treated using prescribed burn methods at a smaller scale. Vegetation management priorities to control noxious and invasive species by maintaining or restoring native weed-free communities would maintain or improve the visual setting.

VRM management would be similar to Alternative 2 except that the North Platte River SRMA, area surrounding the Ferris Mountains, the JO Ranch area, and some areas around the Adobe Town WSA would be managed as VRM Class II. This significant increase in Class II VRM acreage would maintain or improve the scenic quality for more landscapes throughout the RMPPA from visual intrusions.

VRM Class II acreage would be reduced around parts of Pathfinder and Seminoe Reservoirs and would be eliminated in the Shirley Mountains and the checkerboard land ownership pattern. Impacts from these actions would be the same as those listed in Alternative 2.

Wildlife management actions would be the same as those described in Alternative 1, except that special and temporal timing restrictions would be increased. As a result, wildlife habitat, and therefore visual resources, would be improved or protected more under this alternative than any other. However, visual resource management would potentially have a decreased opportunity to locate development activities and associated facilities to areas that would meet VRM management criteria.

Summary

Because of an increase in use restrictions, including closure of the WSAs to OHV use, mineral withdrawals, closures and stipulations, increased avoidance acreage, and prohibition of offroad travel for camping and big game retrieval, impacts to visual resources would be reduced under this alternative as compared to the other alternatives. However, because of the magnitude of new oil and gas development projects, this impact would still constitute a significant impact and would exceed management objectives for VRM Class III.

Visual resources would benefit from the addition of four new SRMAs, the expansion of the Shirley Mountains SRMA acreage, and potential land consolidation by exchange of inholdings within the SRMAs. These actions would increase management opportunities to mitigate visual impacts on former inholdings.

All 140 miles of eligible segments would be determined to be and managed as suitable for inclusion in the Wild and Scenic River system, which would protect them from human impacts that would impair their suitability for designation. This would preserve the visual quality of these waterway corridors.

VRM management class designation changes would improve or prevent significant degradation of the quality of the recreation setting in most of the RMPPA over the long term. Most development would be mitigated and limited to levels appropriate for the designated VRM classes. However, some types of development, such as coalbed natural gas, would exceed these prescribed levels in order to extract the resource, which would be a significant impact to visual resources.

Wildlife habitat, and therefore the recreation setting and wildlife-related recreation opportunities, would be improved or protected more under this alternative than any other.

4.16.5 Impacts Under Alternative 4: Proposed Plan

Air quality, paleontology, and wild horses would have no or negligible impacts on VRM.

Impacts from fire and fuels; forestry; livestock grazing; vegetation; water quality, watershed, and soils management; and wildlife and fisheries management would be similar to those identified in Alternative 1.

Impacts to visual resource management from cultural resource management would be the same as those described in Alternative 3.

Lands and realty management would pursue withdrawals from operation of the public land laws, including disposal, and to mineral location under the mining laws on 46,690 fewer acres than under Alternative 1. Wind energy, facility placement, and routes would be intensively managed if they had to be located in avoidance areas, which would help protect the visual qualities in those areas. Siting these projects in avoidance areas was prohibited in Alternative 3. 46,230 acres would be considered for disposal, and therefore potentially available for exchange in order to attain inholdings in WSAs or SRMAs. Acquiring inholdings through exchange would simplify management of these SD/MAs and allow VRM management of these former inholdings.

Impacts from minerals management actions would be similar to those of Alternative 1, except that 63,510 more acres would be open to leasing with only standard stipulations, 19,330 more acres would be available for lease under stipulations such as NSO, and 2,210 more acres would be closed to leasing, each of which would incrementally help protect visual resources from the impacts discussed in Common to All. Stipulations applied to mineral activities by various other resource programs would result in reduced surface disturbing activities that, in turn, would further protect visual resources, wildlife areas, historic trails, SRMAs, and other areas that have important visual resources.

In WSAs and specific SD/MAs, all offroad travel would be prohibited. In conformance with Wyoming BLM OHV policy, in the rest of the RMPPA, offroad OHV use for the purpose of big game retrieval or access to primitive campsites would be allowed within 300 feet of designated or existing roads and vehicle routes. All other offroad OHV use would be prohibited except in the Dune Ponds CMA (Map 2-44). These actions would reduce the potential for primitive vehicle route proliferation, which would maintain the quality of the visual resources in the RMPPA.

Impacts to visual resources from recreation management actions would be similar to those of Alternative 3, except that mineral closures would occur within 1/4 mile of developed recreation sites rather than 1/2 mile.

The Shirley Mountain SRMA boundaries would be expanded to 37,820 acres, actions would allow oil and gas leasing with an NSO, and existing oil and gas leases would be intensively managed. This would provide additional protections to mitigate for new long-term visual intrusions in the SRMA.

Impacts to visual resources from the Continental Divide National Scenic Trail SRMA management actions would be the same as in Alternative 3.

The North Platte River SRMA corridor would extend to 1/4 mile on either side of the river, would be open to oil and gas leasing with an NSO stipulation and intensive management of existing leases, and would be closed to mineral material disposal. OHV use would be limited to designated roads and vehicle

routes. Surface disturbing activities within 1/4 mile of the river would be intensively managed to maintain the quality of the visual resource. These actions would reduce new visual intrusions from development and maintain the scenic qualities of the surrounding landscapes.

Impacts to visual resources from Jelm Mountain SRMA, the Pedro Mountains SRMA, the Rawlins Fishing SRMA (Teton Reservoir and Rim Lake Recreation Sites), and the Laramie Plains Lakes SRMA (Lake Hattie Reservoir and Twin Buttes Lake) management actions would be the same as those described in Alternative 3, except the Jelm Mountain SRMA and Pedro Mountains SRMA would not be closed to locatable mineral entry and land tenure adjustments. This would increase the potential for new visual intrusions from development and reduce the ability to maintain scenic quality in these areas.

SD/MA management actions (Table 2-1) would have impacts to visual resources similar to those under Alternative 1, except for specific SD/MAs discussed below. Protections that would be afforded to SD/MAs would benefit visual resources, primarily because a greater area within the SD/MAs would be subject to restrictions on surface disturbing activity and active pursuits of land tenure adjustments in this alternative. These actions would maintain or enhance the visual qualities present in the SD/MAs.

The WSAs would be closed to motor vehicles use except for the Ferris Mountain WSA, which would limit OHV use to designated roads and vehicle routes. This is an additional 45,840 acres of land closed to motorized access. Limiting OHV use to designated roads and vehicle routes would be an interim management action in response to the Interim Management Policy, which would benefit the Ferris Mountain WSA. These closures and designations would improve the scenic qualities of the landscapes where the linear visual intrusions of closed and reclaimed routes would be allowed to heal. The landscape would eventually return to its natural condition and be more suitable for designation as wilderness.

Although the Sand Hills ACEC and JO Ranch would be open to oil and gas leasing, there would be intensive management of surface disturbing activities. The 18 acres that include the JO Ranch buildings and a 2-mile transition zone or the visual horizon, whichever is closer, would be managed as VRM Class II, which would protect the visual resources in the area. The area would be closed to mineral material disposals. Management actions resulting in visual elements that diminish the integrity of the JO Ranch setting would be managed in accordance with the Wyoming State Protocol and BMPs. The 18 acres that include the JO Ranch buildings and a 2-mile transition zone or the visual horizon, whichever is closer, would be designated as VRM Class II. Travel would be limited to designated roads, which would help limit proliferation of new routes that create linear visual intrusions. Overall, these management actions help to preserve the visual quality of the area.

The Stratton Sagebrush Steppe Research Area would be closed to oil and gas leasing. Surface disturbance on existing leases would be intensively managed. Offroad travel for “necessary tasks” would not be allowed, which would help limit proliferation of new routes that create linear visual intrusions. These management actions help to preserve the visual quality of the area.

The Historic Trails would be managed for the preservation of historic values. Surface disturbing and disruptive activities would not be allowed within 1/4 mile or the visual horizon, whichever is closer, of the historic trails (Map 2-48). This corridor would be open to oil and gas leasing with an NSO stipulation. Surface disturbing and disruptive activities on existing leases would be managed according to BMPs (Appendix 5). Unevaluated portions of the trails would be managed as contributing until cultural resource inventories are conducted and an evaluation is made as to their contributing/noncontributing status. These actions would maintain the visual quality of the area by restricting development activities that would change the visual character.

Impacts to visual resources within the Blowout Penstemon ACEC would increase compared to Alternative 3. The ACEC would not be closed to locatable mineral entry, as it would in Alternative 3. This would increase the potential for new visual intrusions from development and reduce the ability to maintain scenic quality in this area. However, similar to Alternative 3, offroad vehicular travel would not be allowed in the ACEC, which would help to preserve the visual quality of the area.

The Laramie Plains Lakes area would be a WHMA. The WHMA would be open to oil and gas leasing with an NSO stipulation and closed to locatable mineral entry and mineral material disposals. Existing oil and gas leases would be intensively managed. Offroad travel for "necessary tasks" would not be allowed. Habitat restoration and protection efforts, in combination with the above actions, would maintain and improve the visual quality of the area.

The Upper Muddy Creek Watershed WHMA would be closed to new oil and gas leasing and mineral material disposals. There would be intensive management of surface disturbing activities on existing leases and plans of operation would be required for locatable mineral exploration and development for five or more acres. Motorized travel would be limited to designated roads and vehicle routes. These actions would minimize new visual intrusions and maintain the scenic quality in the Upper Muddy Creek Watershed.

The Cow Butte/Wild Cow area would be designated as a WHMA. Surface disturbing and disruptive activities would be avoided in aspen and mountain shrub communities. The WHMA would be closed to new oil and gas leasing and mineral material disposals. There would be intensive management of surface disturbing activities on existing leases and plans of operation would be required for locatable mineral exploration and development. Motorized travel would be limited to designated roads and vehicle routes. These actions would minimize new visual intrusions and maintain the scenic quality in the Cow Butte/Wild Cow WHMA.

The High Savery Dam and Reservoir would not be managed as an ACEC. These areas would be closed to locatable mineral entry and to mineral material disposals, which would prevent new visual intrusions and maintain the scenic qualities in the High Savery Dam and Reservoir area.

The Encampment River would be determined to be managed as suitable for inclusion in the Wild and Scenic River system and classified as "wild," and it would be managed as a VRM Class I. The WSR designation would preserve visual resources along the river corridor in ways similar to those of WSA IMP. The segment would be protected from human impacts that would impair its suitability for designation and enhance the primitive waterway visual character.

Transportation and Access Management would consider road densities during the analysis process and authorization of surface disturbing and disruptive activities, which would potentially limit detrimental impacts to visual resources in the RMPPA.

Impacts to visual resources from VRM management would be similar to Alternative 3, except that approximately 346,670 acres of Class II areas surrounding the Historic Trails would be eliminated.

Summary

Oil and gas and wind energy developments would create large areas with contrasting visual elements of form, line, color, and texture against the natural landscape, which would alter the existing visual qualities. ROWs, utility corridors, pipelines, and other linear features also detract from the visual quality of the setting. Most visual impacts from development would be mitigated and limited to levels appropriate for the designated VRM classes. However, energy development would exceed these prescribed levels, which

would alter the natural landscape setting into an industrial setting. This would be a significant impact to visual resources. The checkerboard land pattern along the original U.P.R.R. ROW is difficult to manage as VRM Class II because visual mitigation would not apply to adjacent private surface where development would potentially impair visual qualities.

Restrictions and stipulations such as mineral withdrawals or closures and increased avoidance acreage would reduce or limit surface disturbing activities applied to mineral activities by various other resource programs, thereby preventing impacts to visual resources.

Visual resources would benefit from the addition of four new SRMAs and the expansion of the Shirley Mountains SRMA acreage, as well as potential consolidation of inholdings within the SRMAs. These actions offer increased management opportunities to prevent and reclaim visual impacts.

4.17 WATER QUALITY, WATERSHED, AND SOILS

This section describes potential impacts to water quality, watershed, and soils. Section 3.17 describes existing conditions regarding water quality, watershed, and soils. Wetland/riparian areas are also addressed in this section. Section 4.15 describes potential impacts to wetland/riparian vegetation.

Significance Criteria

An adverse impact on water resources as a result of project actions would be considered potentially significant if it violates objectives associated with water quality, watershed, and soils management and its magnitude was such that special mitigation is warranted or it persists indefinitely.

Impacts on water quality, watershed, and soils would be considered significant if any of the following were to occur:

- Degradation of water quality beyond the designated use of the receiving waterbody, or other violations of federal or state water quality standards, or negatively impacting a waterbody listed on the State 303d list of Impaired or Threatened Waterbodies
- Unmitigated loss of wetlands or wetland function (E.O. 11990 and E.O. 11988) or activities that would degrade wetland/riparian areas such that, as a minimum physical state, PFC Standards for Healthy Rangelands (USDI-BLM 1997) are not being maintained
- Streamflow characteristics of perennial streams are altered such that established uses by the public and by federal, state, and local agencies for fisheries and wildlife and for livestock, recreational, municipal, and industrial uses are affected.
- The alteration of stream channel geometry or gradient by accelerated runoff and erosion (e.g., undesirable aggradation, degradation, or side cutting) beyond what would be expected by natural processes
- The natural flow or level of groundwater to existing local springs, seeps, flowing artesian wells, or permitted water supply wells is interrupted or reduced to the point beneficial uses cannot be maintained.
- Groundwater quality in any aquifer is degraded such that it can no longer be classified for its current and potential use(s).
- Soil loss greater than 2 tons per acre per year in areas attributed to surface disturbance after reclamation.

Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of resources and the project area, review of existing literature, and information provided by other agencies. Effects are quantified where possible. Geospatial analysis was conducted using ESRI's ArcGIS Desktop 9.1 computer software. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate.

Analysis of impacts on water resources would be based on achieving the watershed objectives of managing surface land use and groundwater resources to maintain or improve water quality to comply

with the water quality standards for uses and classes as established by the State of Wyoming in the Water Quality Rules and Regulations.

Non-point sources of pollution can include and are not limited to municipal outfalls, concentrated livestock operational areas such as holding pens, watering areas, salt block locations, shade spots or lambing grounds, surface disturbance from construction activities for oil and gas activities, roads and recreational areas, etc. A watershed may contain any or all of these activities and may also contain natural features such as poor soils or steep slopes that contribute to impacts, and may also contain a mixture of private and public land, as well as public lands that are managed by different local or federal governments or agencies. This means that pollution in waterbodies as a result of non-point sources can be difficult to clearly identify causes and effects. However, BLM is committed to address any non-point pollution sources that may be directly or indirectly created as a result of BLM-approved activities. Many times this commitment means addressing these impacts on the activity planning level (Section 1.3); areas may also be singled out for special management (see Table 2-1, actions for Water Quality, Watershed, and Soils, as well as actions for SD/MAs), or if a new problem arises during the life of this management plan and a waterbody is identified with the potential to be listed or is listed on the State 303d list, BLM will address these issues within our legal jurisdiction and as they are identified. The watershed approach to evaluating Standards for Healthy Rangeland will occur on a 10-year rotation schedule, and monitoring as described in 3.17.2 will allow BLM to identify areas with potential water quality problems.

The analysis is based on the following assumptions:

- Substantial disturbance to soil, including compaction of soil or changes in vegetative cover, would increase water runoff and downstream sediment loads and would lower soil productivity, thereby degrading water quality, channel structure, and overall watershed health. The degree of impact attributed to any one disturbance or series of disturbances is influenced by several factors, including location within the watershed, time and degree of disturbance, existing vegetation, and precipitation.
- Changes in channel geomorphology due to activities would likely be detrimental to current designated uses. Sediment in channels is necessary for maintaining channel geomorphology and building riparian systems. Most channel systems achieve a channel form in equilibrium to the water and sediment being naturally supplied to it and generally respond to changes in sediment loads or streamflows by changing the channel form.
- Changes in water quality for surface waters, such as increases in pollutants or physical parameters (e.g., temperature), would degrade habitat used by aquatic life and would affect other designated uses (e.g., stock-watering, irrigation, and drinking water supplies).
- BLM would comply with the Water Quality Standards for Salinity in Colorado River System as recommended by the Colorado River Basin Salinity Control Forum and adopted by the State of Wyoming, Department of Environmental Quality.
- Riparian areas typically function as energy dissipaters during flood events, lessening in-channel erosion, and also may filter some nutrients and sediments improving downstream water quality (Osborne and Kovacic [1993] and NRC [2002]). BLM would assess wetland/riparian sites on BLM land using the PFC method. BLM would manage livestock and implement rangeland improvement projects to seek to bring locations not rated as PFC into PFC, where conditions allow. BLM would continue to develop and maintain water sources in the uplands as a critical tool for managing grazing animals to reduce impacts on wetland/riparian areas.

- Floodplain mapping by FEMA for identified 100-year floodplains is not available for much of the RMPPA. Flood-prone areas within the RMPPA would likely occur within 500 feet of perennial waters and wetland/riparian areas, or 100 feet of ephemeral stream channels, and would be typically classified as Zone D (areas of undetermined, but possible, flood hazard).
- No mixing of chemicals within 500 feet of open water would occur according to avoidance of chemical use near water resources (BLM Handbook H-9011); this would reduce the likelihood of chemical spills from federal actions contaminating surface waters.
- Where appropriate, BMPs and watershed management practices described in Appendices 1, 11, 13, and 15 would be followed and included in project planning and authorization. Access roads would follow standard practices described in Appendix 13. However, properly designed roads would alter hill slope hydrology and concentrate overland flow and erosion in some areas. In areas with steep topography, these impacts would increase.
- Fine-textured soils are more susceptible to water erosion and compaction when wet, whereas coarse-textured soils are more susceptible to wind erosion.
- RFDs and RFAs can be found in Appendix 33.

4.17.1 Impacts Common to All Alternatives

Management actions resulting from air quality, paleontology, and socioeconomics management are not likely to impact water quality, watershed, and soils management under any alterative.

Cultural Resource Management

Cultural management actions generally focus on the protection or preservation of cultural sites and/or settings, which would limit or exclude surface disturbing activities near cultural resources. Surface disturbance would likely still occur, but would be displaced to other locations that may or may not result in increased disturbance and/or erosion. Data recovery as a result of cultural site disturbance is typically in areas that have already been disturbed (Section 4.3.1). Data recovery projects for scientific purposes would likely result in surface disturbance and vegetation removal, increasing localized erosion of not greater than 1 acre per site. These scientific recovery projects are rare, and protection measures afforded by the NHPA and required reclamation would mitigate any effects to acceptable levels.

Fire and Fuels Management

Fires and fuels management actions would include wildland fire suppression and fuels reduction projects including prescribed fires, and chemical, biological and mechanical treatments. In the short term, fuel reduction projects and wildland fires would reduce canopy and ground cover, thereby exposing soils to wind and water erosion and increased runoff potential. Reduced infiltration in some areas would occur with extremely hot fires and would result in higher runoff and hill slope erosion. Soil and water resource impacts from resource-damaging fires include dramatic increases in peak flows (two to five times predisturbance conditions, depending on burn characteristics) and increase in salts, nutrients, and metals in the initial flush flows (1–2 years). Erosion, including slumps, debris flows and other dramatic soil loss events can occur in wildland fire areas for 5–25 years depending on the burn characteristics, intensity of rain events, soils, and geology of the area (Covington et al. 1994; Tiedemann et al. 1979). Over the long term, erosion would be reduced as the vegetation recovers.

Wildland fire suppression activities would result in temporary surface disturbance and soil compaction, from increased vehicle traffic, and staging and/or fire camps. As compared to impacts to water and soil

resources from wildland fire, suppression activities would likely be negligible. The construction of fire lines would increase erosion as a result the removal of vegetation, duff, and the organic layer of the soil. These fire lines would vary in length, width, and depth and, as a result, soil erosion is highly variable. Concentrated surface runoff and increased erosion could occur, especially in areas with steep slopes and/or poor soils. Rehabilitation of fire control lines would occur on most fires (i.e., replacing topsoil when and/or building water bars to direct runoff into unburned vegetation) and would reduce erosion. Fire retardant chemicals used during suppression activities would not be applied on or near open water. If fire suppression chemicals enter an aquatic environment, they would create short-term (1–4 days) impacts to water quality in the form of toxicity. In most cases, only minor amounts of fire suppression chemicals would be introduced to aquatic environments. These toxins generally do not persist in the environment and fish may be able to avoid areas that are toxic (Little and Calfee 2002).

When necessary, rehabilitation and restoration efforts would reduce erosion from wildland fires by providing for plant recovery that would directly protect exposed soils, but may temporarily disturb sites to build sediment retention structures in channels or on the hill slope, as well as seeding or mulching operations.

Forest Management

Opening all forest and woodlands (196,934 acres, Map 3-1) with the exception of WSAs and recreation sites to harvesting of minor wood products would result in erosion and surface disturbance in some locations, which would result in minor increases in sediment loads to waterbodies. No new permanent roads would be constructed for forest management, but some roads would be used to allow for minor wood product harvest. There would be increased surface runoff and erosion from temporary roads and vehicle routes, which would likely be revegetated within 3–5 years of closure. Erosion from the harvesting of minor wood products would be minimal because there would be only selective tree removal. Where these actions reduce fuel loading and improve forest health, they would reduce the risk of large scale disturbance from insect infestation or large wildland fires and subsequent impacts to water and soil resources.

Lands and Realty Management

Lands and reality management actions would result in increased surface disturbance and soil erosion until final reclamation is completed. More than 40 percent of the RMPPA would be closed to the operation of public land laws and locatable mineral entry due to WSAs, public water withdrawals, or other land use planning decisions. In most cases, areas closed to public land laws would not experience locatable mineral exploration or development activities that would result in surface disturbance. In most cases, this action would preclude the sale or disposal of these lands depending on the specifics of the withdrawal decision. If lands were open for disposal, they would still need to adhere to the criterion in Appendix 6.

The designation of ROW corridors shown on Map 2-2 would result in less dispersed disturbance from locating these utilities outside of the corridors and would concentrate utilities in these mostly existing corridors. All designated ROW corridors would avoid, to the extent possible, those areas identified on Map 2-30 to 2-33 and in Table 2-5. This would reduce primary disturbance (i.e., disturbance in areas that have never been disturbed) and associated soil erosion.

Proposals for alternative energy development would be considered, and it is expected that a minimum of one new thousand-turbine wind power facility would be proposed, resulting in estimated 1,940 acres of short-term and 1,280 acres of long-term disturbance (Appendix 33). Road construction and use, along with surface disturbance for facilities, would increase local erosion from wind energy development.

Livestock Grazing Management

The entire RMPPA would be available for livestock grazing, with the exception of developed recreation sites and exclosures for sensitive resources. Livestock grazing would reduce vegetation cover and cause surface disturbance from hoof action and compact soils in localized areas. Reduction of vegetative cover would also result in increased sediment and salt loads in localized areas, increased surface runoff, and less storage and retention of soil moisture. However, implementation of livestock management to achieve Standards for Healthy Rangelands (USDI, BLM 1997) would reduce livestock grazing impacts on water quality, watershed, and soil resources. Conservation and mitigation measures for livestock operations would be implemented (Appendix 13 and Appendix 15); many of these measures would reduce grazing impacts to water and soil resources when successful.

Livestock grazing on public lands would potentially result in periodic increases of fecal coliform when flows are low and livestock concentrations are high (*E. Coli.* is one type of bacteria that can be present in animal feces and causes human health impacts). Currently, there are no 303d listed waterbodies for *E. Coli.* in or downstream of the RMPPA in Wyoming or other neighboring states (Appendix 11). If a waterbody were to exceed standards for *E. Coli.* due to livestock grazing, management would be adjusted (Standards for Healthy Rangelands, Appendix 8).

Minerals Management

Active oil and gas leases will be developed. Known fields are shown on Map 3-5; the majority of these areas are in the Colorado River and Great Divide Basins, and there are only isolated fields in the North and South Platte River Basins (Map 3-11). Development is expected to be in or near these existing oil and gas fields, and therefore the majority of oil and gas development is likely to occur in the Colorado River and Great Divide Basins. Oil and gas development would result in increased soil erosion, sediment loading, and potential groundwater contamination from drilling operations. Increased erosion and surface runoff would occur from soil compaction and the channelization of surface runoff in culverts and road ditches. Intercepting runoff above roads concentrates flows and increases erosion. As this runoff is not re-spread below roads, these areas become drier, which reduces plant productivity, alters species composition, and increases soil surface exposed to wind and water erosion. Drainages which receive this concentrated, increased flow often erode downward, further increasing erosion and sediment loading downstream. Proper construction of well pads and roads, disposal practices, proper casing and cementing, and reclamation of drilling reserve pits in accordance with BLM guidelines would reduce these impacts (Appendixes 1, 11, 13, and 27); however, soil erosion would still be significant in developed areas.

The development of CBNG would reduce pressures in coal seams by withdrawing water. CBNG development would lower water levels and hydrostatic pressure in springs geologically connected to the producing formations. Changing pressure regimes in groundwater aquifers would potentially increase natural gas migration updip and along conduits such as faults or old well bores. This increased gas migration would kill vegetation in some locations, change the beneficial uses of existing springs and may, in some circumstances, be a hazard if the gases are flammable or coals are exposed to oxygen.

Oil and gas development involves cross-country travel to stake well locations and associated roads and pipelines. Also, geophysical exploration requires cross-country travel. Frequently, these cross-country routes are not the locations of eventual roads or pipelines. Each cross-country trip crushes native vegetation, and increases soil susceptibility to erosion. Steep slopes and highly erodible soils would allow for a higher potential for water-borne sediments to reach drainages. In addition, surface flows would increase along vehicle tracks in loamy and clayey soils from an increase in soil compaction and reduced infiltration. Research has shown that it is common for water infiltration in wheel-tracks to be reduced to approximately 50 percent of the infiltration rate without traffic (House et al. 2001; Lindstrom and

Voorhees 1980; Young and Voorhees 1982; Ankeny et al. 1990; Allen and Musick 1997). Kemper et al. (1982) measured reductions in infiltration rates from 12–80 percent. Kemper et al. (1982) and Allen and Musick (1997) found water content of the soil at the time of compaction had a significant impact on infiltration, as did the compacting loads. Ankeny et al. (1990) concluded that compaction primarily destroys the large pores which are necessary for retaining water available for plant growth. Allen and Musick (1997) found water movement in vehicle tracks was twice as quick as in non-traffic areas. Damage from compaction may persist for years (Voorhees et al. 1986).

Reclamation of previously mined coal areas would continue on the Hanna Basin area mine sites. For example, the Rosebud mining operation near the town of Hanna began mining in 1964 and covered 4,000 acres of disturbance and still has some reclamation activities. Successful reclamation activities would improve local watershed and soil conditions by stabilizing soil, improving local surface hydrology, and reducing the potential for erosion. However, even after reclamation, these areas may take as long as 30–50 years to return to predisturbance conditions in sagebrush-dominated communities.

The discretionary disposal of mineral materials such as sand and gravel would potentially have soil and water impacts that would include increased localized erosion, sedimentation in streams and rivers, channelization, and ponding of surface runoff. If mineral materials disposal activities would be detrimental to water quality and watershed health, the design would be evaluated to determine if changes in methods, road routes, or design would mitigate impacts (Appendix 1, Appendix 13, and Appendix 15). If impacts to soil and water resources cannot be mitigated, projects would not be approved because they are discretionary actions.

OHV Management

The use of OHVs would be limited to existing or designated roads and vehicle routes (Appendix 21 and Map 2-5). OHV use would result in localized increases in erosion caused by soil compaction and modification of surface hydrology from tire ruts on these designated road and routes. Where these roads and routes bisect or parallel stream channels and/or wetland/riparian areas, increased erosion, changes in hydrology, and increased sediment or nutrient loads would occur. OHV use during periods of high soil moisture conditions would accelerate localized erosion from fine textured soils. In areas where increased erosion has been identified as a resource concern, temporary, seasonal, or permanent closures to motorized vehicle use would occur for the protection of water and soil resources.

Offroad motor vehicle use would be allowed for “necessary tasks” except in WSAs and specific SD/MAs and would result in soil compaction, erosion and modification of surface hydrology in these locations. Impacts of cross-country travel would be the same as described under Minerals section above.

The Encampment River Canyon Area (about 4,500 acres) would be seasonally closed to motorized vehicle use, and the Encampment River Trail would be closed to all types of motorized vehicle use year round. A reduction in vehicle use would reduce localized erosion and potential non-point source sediment pollution in the Encampment River Canyon.

Paleontology Resource Management

Collecting of scientifically significant vertebrate fossils by qualified paleontologists would be allowed by permit only. Permitted excavations would result in surface disturbance, soil compaction, and vegetation removal, and minor erosion that would reduce as the site is reclaimed and revegetated. There is an average of about 1 of these projects per year and the disturbance is typically less than 1 acre.

Recreation Resource Management

Improvement and maintenance of recreation sites would generally reduce weeds; maintain the integrity of roads, camp sites and recreation areas; and dispose of waste material from public use. These activities would benefit soil and water resources by reducing erosion and pollutants.

The entire RMPPA would be open to dispersed recreation, which would result in erosion from surface disturbance from hikers, mountain bikers, horses, and OHV use of roads and routes. Vehicle use would result in moderate to severe erosion and rutting when fine textured soils are saturated. Other than vehicle use, these impacts are typically minor to moderate.

Special Designations/Management Areas

Wilderness study areas (Map 2-6) would be managed to maintain suitability for preservation as wilderness. This management would maintain or improve soil and water resources by limiting surface disturbance that could contribute to erosion and non-point sources of sediment and other pollutants.

Transportation and Access Management

All roads and vehicle routes would be inventoried to identify those available for closure, modification, or maintenance. Roads or routes that erode beyond acceptable levels would be maintained or closed to reduce erosion. Road closures would reduce erosion, surface runoff, and non-point sources of sediment downstream (Appendix 13).

Vegetation Management

Vegetation communities would be managed to achieve and maintain proper ecosystem function, which would benefit soil and water resources by reducing erosion and increasing infiltration and soil development. Vegetation management prescriptions would be implemented to meet the Healthy Rangelands Standards, which would maintain soil erosion and deposition at acceptable levels (Appendix 8). Improving and diversifying vegetation would have an indirect benefit of improving watershed health by reducing peak flows, hill slope and channel erosion, and sediment loading.

Visual Resource Management

VRM management actions limit visual intrusions, while providing for other resource values. This would be achieved by locating access roads, buildings, drill pads, etc., where they are not visible from particular locations. In some cases, infrastructure would be displaced to locations that may result in increased surface disturbance and erosion compared to the original site. For example, increasing road length to achieve visibility goals would increase surface disturbance and associated erosion. In other cases impacts may be fewer; for example, reducing the cut and fill for a pad by relocating it. Regardless, VRM resources would be managed to meet Wyoming Standards for Healthy Rangelands, including protecting water quality, and compromises would be made when appropriate.

Water Quality, Watershed and Soils Management

Intensive management (see Glossary) of watersheds contributing to waterbodies listed on the state's 303d list of threatened or impaired waterbodies would be required (Table A11-1). 2006 303(d) (Waterbodies with Impairments or Threats) would include the application of BMPs described in Appendix 1, Appendix 8, Appendix 13, and Appendix 15, and would likely improve water quality where these BMPs are applied. BMPs include implementation of grazing systems, quality road design, drill pad placement and

construction techniques, engineered stream crossings, and other methods to reduce non-point source pollution to these waterbodies.

Reservoirs would be rehabilitated or reclaimed where they become functionally compromised. Options include breaching dikes and reclamation as needed in the reservoir pool, rebuilding the reservoir to original specifications, or redesigning the reservoir to improve the design or increase capacity. Reclamation of disturbed lands such as those in the pool of reservoirs can be difficult; therefore, even with proper techniques and the application of BMPs in Appendix 13 and the Reclamation Plan (Appendix 36), there are likely to be short-term (1–5 years) impacts due to surface disturbance needed to reestablish original topography. Management goal changes or better knowledge of precipitation and flow regimes would necessitate the redesign of some structures and would result in additional engineering (e.g., providing drainage near the toe of the dam, inserting a low-flow pipe, and/or rebuilding the spillway). This additional engineering would be coordinated with the State of Wyoming for dam safety as necessary. Regardless of specific activities associated with rehabilitating or reclaiming reservoirs, impacts would include surface disturbance from new construction that would likely result in localized increases in sediment loads and temporary or permanent changes to flow regimes. Avoiding the abrupt failure of a functionally comprised reservoir by rehabilitating or reclaiming it would reduce extreme erosion and sediment loads that would occur during a dam failure.

Water and soil resources would be managed to meet the Wyoming Standards for Healthy Rangelands (Appendix 8), which would maintain soil erosion and deposition at acceptable levels. Healthy Rangeland standards relate to watershed function and would be used to assess impacts to water quality for specific projects, watershed, and soils resources when they are applied at the activity and project planning stage. This would be achieved by multi-disciplinary review of activities such as livestock grazing and mineral resource extraction on the public lands, and this process would allow detailed analysis of proposed actions. Planning would include management decisions and/or BMPs to achieve “optimal plant growth and minimal surface runoff,” as well as the other standards, in consideration of multiple use land management considerations. For a more detailed analysis of these standards and how they apply to specific activities, see the impact analysis for Alternative 1 and Appendix 8.

Headward erosion in stream channels (headcuts) would be stabilized in 10 locations, and some channel restoration work (25 miles) would be needed on public lands to meet, maintain, or improve water and soil resources to meet Rangeland Standards (Appendix 13 for a description of methods). Headcut stabilization projects would cause temporary local erosion during construction and until the site is reclaimed. Headcut stabilization structures would be keyed in and designed to prevent future head-ward erosion, and therefore should in the long term significantly reduce the in-channel erosion. These structures would likely protect riparian areas upstream and allow for the function of these systems for the benefit of water quality. Channel restoration work would benefit the sediment and flow dynamics of stream channels by increasing channel length and reducing energy available for eroding stream channels, providing controlled non-erosive vertical drops and other techniques designed to reduce in-channel erosion and improve riparian function (Appendix 13).

Shallow groundwater, precipitation, stream gaging and other monitoring sites (50 over the life of the plan) would be used to assess water quality and quantity to test the attainment of Healthy Rangelands, Standard 5 (water quality meets state standards). The establishment and maintenance of these sites would have temporary short-term impacts to water quality, watershed, and soils resources. For example, stream channels would need to be disturbed to install flumes or weirs to measure water quantity. Vegetation and soil resources may need to be disturbed to install rain gages and/or establish surveying benchmarks. Coordination with local and state organizations would occur when collecting data to ensure BLM monitoring sites are established in accordance with state methods such as the “Burp” protocol and to reduce duplicative monitoring sites (Appendix 11).

Avoidance of surface disturbance in unstable areas or in identified 100-year floodplains, 500 feet from perennial surface water, springs, wetland and riparian areas, and 100 feet from ephemeral channels would reduce potential erosion, sediment loads, and degradation of water quality. Surface disturbance would be modified or moved as a result of this action, as opposed to decreasing the total disturbance.

Intensive management of surface disturbing actions within the Muddy Creek and Encampment Watersheds would reduce adverse impacts to soil and water resources in these watersheds by altering the location or design of projects (Appendix 13). Erosion, sediment, and nutrient loads would likely be reduced through intensive management of livestock grazing and mineral resource extraction. The Encampment Watershed is important as a source of drinking water for municipalities, a potential WSR segment, and recreational uses such as boating and fishing. Muddy Creek watershed has several unique native fish communities, two potential segments for WSR designation, and three reaches that are currently listed on the State 303d list for threatened or impaired waterbodies (Appendix 11). Therefore, reducing erosion, sediment, and nutrient loading upstream of these municipal intakes and unique resources would likely maintain water quality and thereby enhance the value of these designated uses.

Wild Horse Management

Wild horse use in areas around water sources would decrease vegetation cover and increase erosion in areas with limited reliable water sources and during drought years. Further, the implementation of Standards for Healthy Rangelands (USDI, BLM 1997) and monitoring and evaluation of habitat conditions in the HMAs would help ensure proper management of wild horses by keeping herds at AMLs and serve to minimize effects on watershed and soil resources. Gathering areas would experience short-term disturbance from hoof action and vehicle traffic. Gathers would improve the long-term health of the rangeland by keeping horse herds at AML, and indirectly improve watershed function by reducing erosion around water sources and use of the uplands and riparian areas for grazing.

Wildlife and Fish Management

In general, wildlife and fish habitat management actions limiting surface disturbance in sensitive wildlife areas, such as RCAs, would reduce surface disturbance. Less surface disturbance would reduce soil erosion, and maintain diverse plant communities that are better able to slow and filter overland flow, reduce erosive forces that contribute to salt and sediment loads and the loss of topsoil. In some cases, infrastructure would be displaced to alternate locations that may result in new impacts to soil and water resources. For example, moving drilling locations to avoid nesting sites may increase road length and, therefore, would increase surface disturbance and erosion associated with this activity. Also, the reverse may be true; for example, if a raptor nest site precluded a well pad location on a steep rocky slope in favor of a flatter area, impacts to water and soil resources would be less from the pad construction.

In coordination with other agencies, BLM would transplant, reestablish, and/or augment wildlife and fish species on public lands. For fish species, these activities would require the establishment or removal of fish barriers depending on the goals of the project. These activities would be coordinated in a multi-disciplinary planning process that would consider watershed impacts, such as increased sediment loads, or loss of water development projects, such as diversions or headcut structures.

4.17.2 Impacts Under Alternative 1: Continuation of Existing Management

Management actions resulting from air and socioeconomics management are not likely to impact water quality, watershed, and soils management. Impacts from visual resource management would be the same as those described in actions common to all.

Cultural Resource Management

Protection or preservation of cultural sites would benefit water and soil resources by limiting or excluding surface disturbing activities on or near such sites. Surface disturbing activities would be avoided within 1/4 mile or the visual horizon, whichever is closer, of the cultural resources if the historic setting contributes to NRHP eligibility. These avoidance areas would reduce activities that cause surface disturbance in these locations. However, it is likely that these avoidance areas would change the individual locations of facilities and not the total acres of surface disturbance. New locations may not necessarily be better situated from a watershed perspective. Impacts to soil and water resources, such as increased local erosion and overland flow, would be considered on the activity planning and decision level, and impacts would be avoided when possible. Data recovery as a result of cultural site disturbance occurs typically in areas that have already been disturbed (Section 4.3.1). Data recovery projects for scientific purposes would likely result in surface disturbance and vegetation removal, increasing localized erosion of not greater than 1 acre per site. These scientific recovery projects are extremely rare and protection measures afforded by the NHPA and required reclamation would mitigate any effects to acceptable levels.

Fire and Fuel Management

Fire and fuel management actions would indirectly disturb approximately 84,000 acres over 20 years (Appendix 19). This alternative would have the fewest acres treated in the wildland/urban environment (200 acres/year). Because the least amount of fuel reduction in the wildland/urban environment would occur under this alternative, suppression activities would be more aggressive in this environment and would potentially involve heavy equipment to build fire lines and increase the use of fire retardants. Fire lines built with heavy equipment are more difficult to reclaim and create more disturbances on the landscape (about 10 feet wide as opposed to 1 foot wide for hand lines); fire retardants can cause short-term toxicity to the aquatic environments if applied on open water or in sufficient quantities.

Forest Management

The use of natural processes, such as prescribed fire, chemical, mechanical, and biological treatments to modify forest communities or timber stands, would reduce canopy cover, disturb the soil surface, and increase erosion in the short term (1–5 years). Over the long term (5 years or longer), forest management actions that effectively improve the health and vigor of the forest would reduce soil erosion by reducing the chance of widespread loss of trees through insects, disease, and wildland fire. This widespread loss of trees would contribute to accelerated erosion by exposing the soil to rain splash erosion (the physical action of rain drops detaches soil particles), increased rilling and gullying caused by higher overland flow rates, and direct erosion by exposed root masses as trees fall down. Improving the health and vigor of forests would result in increased ground cover and would reduce surface erosion.

A total of 28,500 acres would be available for harvest of commercial wood products. The largest of these areas is in the Shirley Mountains (Map 3-1). As roads are upgraded to provide access to commercial products, impacts would include changes in surface hydrology and increased erosion from concentrating overland flow along roads and through culverts. Reduction of the canopy cover resulting from logging opens the soil surface to rain splash erosion and can increase rilling and gullying, the primary processes that contribute sediment to channels. Forest litter, duff, and organic material forming ground cover are the most important components for protecting the mineral soil from erosion in forested systems (Elliot et al. 1996). Although removal of the canopy increases rainsplash erosion, any harvesting techniques that remove ground cover would contribute more to hill slope erosion. Hill slope erosion would eventually increase sediment loads to receiving waters through rill and inter-rill erosion. This is especially true for

logging in areas with steep slopes and riparian areas. Therefore, BMPs and harvesting techniques would be applied to reduce the disturbance of the soil surface where possible during logging activities.

Included in the 28,500 acres would be 6,700 acres of sensitive areas, including steep slopes and riparian areas. These areas would require additional restrictions or mitigation measures; some of the techniques that would be applied are discussed in Appendix 13. However, because of the sensitive nature and important function of these areas for watershed resources, direct impacts from commercial logging activities to water resources are expected to be greater in these areas.

Temporary improvement of existing roads for commercial logging activities would alter surface hydrology by intercepting and channeling shallow subsurface flow and lead to direct erosion from concentrated flows along the roads and their drainage features. Studies of the effect of logging roads show that post-storm turbidity can be attributed more to erosion from roads than any other source (Dunne and Leopold 1978). In the short term, these activities would increase erosion and change surface hydrology in some locations.

Clear-cut areas would have localized erosion and would transport sediment to adjacent drainages. The remaining understory and slash would provide some protection to the soil surface from rain splash and other erosional processes. Although, the potential for short-term accelerated erosion above acceptable levels would be high in areas of intense forest product management, such as clear-cuts and areas with temporary logging roads, proper timber harvest techniques would reduce these effects.

Lands and Realty Management

An additional 63,670 acres of land to the 935,530 acres already withdrawn (Table 3-4) would be withdrawn, which would remove these areas from sale and mineral location or entry, under some or all of the public land laws, to maintain other public values in these areas. Lands with high surface values would not be disposed of unless the values would be preserved.

An average of 11 acres per year would be disturbed by the construction of irrigation ditches (Appendix 33). This disturbance would be linear and, therefore, would have more potential erosion caused by the interception of drainage features. Ditch ROW proposals would be evaluated for impacts to water and/or soil resources, especially in locations with poor soils or steep topography. Even with appropriate planning, ditches are susceptible to washing out during extreme precipitation events, and ditches that cross drainages would modify local surface hydrology.

Approximately 6,020 acres over 20 years would be disturbed from lands and realty actions; approximately 45 percent of this disturbed acreage is expected to be reclaimed. Construction of facilities, pipelines, and roads to access utilities would cause localized short-term effects on watershed and soils and long-term impacts from permanent maintenance buildings and access roads. Utility access roads and maintenance buildings would compact soils, remove vegetative cover, and increase and concentrate surface runoff; these activities would result in localized soil erosion and contributions to non-point source pollution.

An average of 56 acres per year would be disturbed to install telephone, fiber-optic cable, and power lines. For smaller projects, these types of disturbances would include ditch-witching or the split trench method of cable installation and the placement of power poles, which would cause limited soil disturbance. The “split trench” method of construction would cause localized short-term effects on water and soil until the disturbed area is reclaimed. Larger projects that require trenching for cable installation and power lines that require access road construction would result in localized soil erosion and increased

surface runoff, and would contribute to non-point sources of sediment and salts in watersheds that would dissipate with successful reclamation.

Disturbance from pipeline construction of about 719 acres per year would result in increases in localized soil erosion and increased surface runoff, and would contribute to non-point sources of sediment and salts in watersheds that would dissipate with successful reclamation. Traditional excavation and burying of pipelines would result in extensive disturbance of soils and vegetation. Impacts from surface disturbance would include short-term erosion, long-term changes in local surface hydrology, and decreased soil productivity from mixing and compaction. If new roads were needed to access pipelines for maintenance, impacts from road construction would include short-term erosion and long-term changes in surface hydrology.

Pipeline crossings of streams would require surface disturbance to build staging areas for directional drilling or open-channel crossings. Because of their proximity to stream channels and potentially steep terrain, these staging areas would result in direct sediment contribution to streams if high-intensity precipitation events occur during construction and overwhelm sediment fences. Directionally drilled pipeline crossing would potentially result in drilling mud “blowouts” if the geology is not conducive to drilling. These mud blow-outs are typically short-lived (i.e., until the loss of mud is identified by the drillers) but can contaminate drinking water wells in the alluvium or streams with bentonite clay and other additives. Drilling muds would reduce the flow of water in areas where they blow out, potentially reducing the productivity of drinking water wells or compromising the function of the hyporheic zone. Open-trench crossings would contribute to temporary increases in sediment loads below the crossing as equipment digs the trench, and would potentially change flow dynamics and channel morphology in the river bed until bed material is redistributed during flood events. Stream channel scour would potentially expose pipelines during extreme flow events, requiring maintenance of crossings; however, pipelines are typically buried at sufficient depths to avoid these impacts.

Lands and realty management, including wind energy facilities, utility facilities, transportation systems, and communication sites, would avoid certain areas (Map 2-30). Additional areas would be closed to utility/transportation systems and wind energy (Table 2-5). Avoiding sensitive areas such as slopes greater than 25 percent, identified 100-year floodplains, and areas that are 500 feet from perennial surface water, water wells, springs, wetland/riparian areas, and ephemeral channels (Table 2-5) when building wind energy facilities, utility facilities, transportation systems, and communication sites would reduce surface disturbance. When avoidance is not possible, construction of facilities in these areas would require mitigation for potential impacts to the soil and water resources (Appendix 13). Avoidance of sensitive areas would maintain the natural hydrological processes and avoid disturbance of plants and soils adjacent to water resources, thereby reducing non-point source pollution.

Non-oil- and gas-related road construction would disturb 41 acres for the 7 miles of road construction or improvement planned per year, or about 140 miles over the next 20 years. These roads would have a crown and ditched shape (Appendix 13) and would be surfaced with gravel where possible. Road construction would disturb topsoil and vegetation along the road right-of-way and decrease infiltration, leading to an increase in surface runoff and soil erosion until these non-traveled areas are reclaimed. Road construction requires the building of a road surface that would adequately drain precipitation, typically crowned (raised in the center and sloping to either side) or outsloped (drained to one side), with collection ditches for water shed from the road surface, and a way to convey this concentrated water to non-erosive dissipation structure (wing ditches and cross culverts). Roads increase flood peaks, which, in turn, can increase stream channel erosion. All road locations would be planned with avoidance of water resources (Table 2-5) and according to BMPs for road construction and for stream crossings (Appendix 13). Stream crossings by roads would increase channel erosion and non-point source pollution in some locations for at least 2 years. Depending on the design, road crossing on stream channels would increase the

concentration of flow within the floodplain, cause vertical adjustment of the channel bed (headcuts) and decrease channel sinuosity in some locations.

Livestock Grazing Management

Impacts from livestock grazing would be the same as those described in common to all, along with impacts from range improvement projects. An estimated 45 acres per year of surface disturbance would occur as a result of range improvement projects. With proper planning and effective management of range improvements, any adverse impacts to soil and water resources would be minimized. Range improvements would be designed to maintain or improve the distribution of livestock within each allotment and prevent livestock concentration and overuse of forage that leads to increased surface runoff and soil erosion. Grazing systems and range improvements would improve or maintain desired range conditions, which would minimize impacts to soil and water resources from livestock grazing. For example, increasing willow cover in riparian areas by changing the time or duration of grazing made possible by the range improvements would reduce flow energy and reduce in-channel erosion during flood events. The immediate area surrounding range improvements would generally be subjected to increased erosion from construction disturbances and livestock concentrations around water developments and along fence lines. These impacts would be minimized through rocking or graveling the surface around water tanks and shortening the season of use.

Range improvements projects include 10 reservoir/pit developments per year, totaling 200 over 20 years. The majority of these projects would likely be built in the Colorado River or the Great Divide Basin, because water rights in the Platte River Basin (Map 3-11) make new reservoirs or pits impractical in this basin. Depending on the number of these projects that are instream structures and the capacities of individual projects, the natural hydrology in these drainages would change. Peaks in the hydrograph would potentially be attenuated and more water would be conveyed via groundwater. Before any project would be approved or built, changes in the hydrograph would be evaluated with regard to fish populations, wetland areas, and other important downstream resources. Salinity would increase below instream earthen structures in which the native material contains salts that are easily dissolved; therefore, some of these reservoirs and pits would increase salt loading downstream. Potential effects to downstream values from these projects would be evaluated and mitigated when possible. Water depletions and salt loading in the Colorado and Platte River Basins would be considered on a project-specific basis.

Minerals Management

Oil and natural gas (both conventional and CBNG) exploration and development would result in approximately 62,000 acres of short-term surface disturbance, 17,000 acres of long-term surface disturbance, and approximately 3,300 miles of new roads. Roads and pads effect runoff and surface hydrology by (1) generating excess overland flow from road surface and cut slopes, (2) directing water into swales or stream channels, and (3) increasing drainage density from higher overland flow (i.e., cause more rilling and gullying). These factors increase the frequency and magnitude of runoff and sediment transport, which would have implications for downstream water quality and watershed function. Project construction and development disturbance, or short-term disturbance, leads to indirect impacts such as increased wind-borne erosion. The deposition of wind-borne erosion may be a significant source of sediment available for transport to stream channels in Wyoming (Linse et al. 2001). Long-term disturbance, including roads that would be left in place after development, would have long-term impacts on surface hydrology by removing vegetation and leaving bare ground, which would increase overland flow and sediment transport. Reclamation and BMPs would reduce the short and long-term impacts on water and soil resources by minimizing surface runoff, thereby decreasing erosion and channelization from pad and road construction and other short-term disturbance (Appendix 1, Appendix 13, and

Appendix 15). However, impacts to water resources from roads and pads can be long term and are not necessarily removed by BMPs or successful interim reclamation.

Impacts of oil and gas development on water quality would be concentrated in some locations and would likely not occur in locations with no potential for oil and gas (Map 4-7). The Colorado River and Great Divide Basins (Map 3-11) would likely experience most of the development, as can be seen from the oil and gas field map (Map 3-5). There are two CBNG projects in the North Platte River Basin, old oil fields, and exploratory conventional natural gas. However, in the Colorado River Basin, there are high-potential areas for oil and gas development, many producing oil and gas fields, and projects proposed for conventional, CBNG, and continued oil field development. The Great Divide Basin has large conventional natural gas fields that are well into the production phase. In Wyoming's 2006 305(b) Water Quality Assessment Report, WDEQ states that, for the Muddy Creek watershed draining in the Colorado River Basin, "… projected increases in CBNG development have the potential to lead to increased surface disturbance and possible increased erosion and sediment loading" (WDEQ 2006).

Drilling methods would follow practices described in Appendix 15 to protect groundwater, and would include the use of drilling muds to lubricate drilling bits, keep the drill hole open, prevent other less dense fluids from entering the drill hole, and flush/pump/recirculation cuttings to the surface. Drilling muds may contain bentonite clays, chemicals (corrosion inhibitors, surfactants, lubricants, pH control agents, etc.), and salts, depending on the application. Specialized fluids are also used for well completion, fracing and other methods for increasing production from existing well bores. These fluids may enter groundwater through fractures or improper cementing and/or damaged casing. Even if these fluids are handled properly using accepted drilling techniques, contamination may result from corrosion of casing or unique geologic conditions. Surface storage of conventional natural gas condensate would likely result in condensate spills and water or other fluid pipelines may fail in some locations. Condensate storage tanks are typically surrounded by earthen berms to limit the extent of spills and many pipelines have spill detection systems. Localized contamination of groundwater would occur because groundwater quality and contaminate sources are likely to be impacted in some locations. All detected spills or contamination would be addressed according to Appendix 32, as well as Spill Prevention Plans and Master Drilling Plans for individual projects.

Road and pad construction especially near waterbodies would increase overland flow, concentrated flow, and channel erosion downstream from disturbance. Martherne (2006) found significant sediment production from well pad locations and confirmed that roads and well pads can provide conditions for concentrating runoff and increasing erosion. Based on field observations, the author found that roads and pads on side slopes facilitate the erosional process in two ways: (1) They cut across established drainages and concentrate runoff and (2) they are cut into hillsides or into the land surface, which provides focal points for the initiation of erosion. Roads also provide conduits for sediment transport. Once mobilized, a portion of this sediment resulting from these erosional process moves into stream channels in pulses that occur during storm events. Some of this sediment would be temporarily stored in drainage bottoms and on the hill slope, and a portion would be stabilized by vegetation and not travel to the drainage. Sediment loading from roads and pads to specific watersheds can only be determined based on site-specific data that would be available during project planning. Hubert and Eaglin (1993) found that road building can have landscape impacts. They also found that culvert density in logging areas in the Medicine Bow Mountains was positively correlated to both the amount of fine substrate and embeddedness present in streams downstream.

The removal of vegetation exposes soil to erosional processes due to wind and water action on surface disturbance from road and pad construction. When this eroded soil or sedimentation enters surface water, it decreases water quality and would decrease the utility of aquatic habitats by filling pools and reducing pore space in gravel beds and important habitat for macroinvertabrates (water quality standards are based

on designated uses including aquatic habitat). Linse et al. (2001) found that at least 30-percent total cover should be maintained to control sediment yields from short duration-intense storms. The authors also found that conditions in Wyoming can yield considerably higher sediment yields than those predicted by the Revised Universal Soil Loss Equation or a modified version of that equation. The authors also found that sediment yields decrease moderately upon reaching 30-percent total cover. However, sediment yields were low in excess of 70-percent groundcover. The Reclamation Plan (Appendix 36) would allow "30–50 percent of predisturbance ground cover" after 2 years to be considered successful reclamation; after 5 years "50–80 percent of predisturbance ground cover" would be considered successful. Given that predisturbance total groundcover in shrublands in the RMPPA is typically 20–65 percent (the term "groundcover" includes rocks and litter in addition to vegetation, i.e., total cover), successful reclamation could be expected to achieve 6–32-percent total cover in 2 years and 15–52-percent total cover in 5 years. In the National Range and Pasture Handbook, successful grass cover establishment in 1–2 years on slight to moderate slopes and a cover of 60–70 percent is considered necessary for soil stability. The Handbook comments that excess runoff accelerates rapidly when groundcover falls below 70 percent (NRCS 2006).

With successful reclamation in areas where surface disturbance has occurred to build roads, drill pads, pipelines and other utilities, shrublands would be converted to grasslands. This could result in increased erosion compared to shrublands. In dry and/or harsh conditions shrubs, such as those common in the RMPPA, provide a microclimate that facilitates the establishment of other plants, such as grass and forbs, as well as increasing soil moisture by retention of snow and lowering the loss of soil moisture (Chambers and Linnerooth 2001). Some areas where reclamation has been successful may begin to get sagebrush and other brush regeneration; however, areas would not return to predisturbance watershed function until 30–50 years after final reclamation. Because of decreases in canopy cover, lower stem densities, lower evapotranspiration rates, and changes in soil moisture regimes, watershed function important for water quality would be compromised with conversion from shrublands to grasslands. Anderson (1975), in a study of 23 watersheds, found that conversion of steep forest and brush lands to grassland had multiplied sediment yields by 5 times. Although Anderson (1975) presents extreme cases of vegetation conversion, it points out that not all vegetation is the same hydrologically. Shrubs and woody vegetation such as rabbitbrush, sagebrush, and bitterbrush may modify runoff and groundwater recharge components in direct and indirect ways. For example, woody vegetation can (1) alter soil infiltration characteristics, through root penetration and the addition of organic matter; (2) preserve soil moisture, through shading and mulching; (3) draw off soil moisture, through transpiration or interception; and (4) alter subsurface flow paths through root activity that leads to the formation of macropores (Wilcox 2002).

Increases in upland erosion rates would modify watershed and riparian function in some locations. This would most likely occur directly adjacent to disturbance, but could occur downstream as sediment transport pulses work their way through the system with storm events. Wetland and riparian areas operate as filters and traps for sediment pulses. As changes in topography (e.g., a widening valley with decreased slope) cause reduced stream velocities, and as surface roughness caused by wetland vegetation slows stream flows, increased suspended sediment loads are deposited. These sediment deposits can be stabilized by wetland vegetation between flood events or permanently and, in some cases, would decrease the function of these areas if the sediment supply overwhelms the vegetation's ability to stabilize deposits. Fine sediment from upland erosion would also be deposited in pools and riffles, reducing the assimilative capacity of some watersheds to handle sediment inputs from natural events, such as floods.

Reclamation techniques are described in the reclamation plan (Appendix 36). Initial disturbance would be limited during project planning. Soil stabilization through establishment of a vegetative ground cover on disturbed sites would commence the first growing season following surface disturbance. Proper construction and surface stabilization techniques and planning are essential in accelerating the return of vital vegetative components (forb, shrub and grass) and functions. Mulch, filter fabric, soil tackifiers and other techniques would be used to stabilize disturbed areas during construction and prior to reclamation.

Topsoil would be handled separately from subsoil materials. Retention of topsoil for reclamation purposes would increase the availability of mycorrhizal propagules that influence the success of sagebrush reestablishment (Lyford 1995). Topsoil salvaged would be used within 1 year in most cases. If microfauna in topsoil are not present during reclamation initially, successful plantings may suffer in subsequent years until recolonization is achieved.

CBNG development would occur in the North Platte, Great Divide, and Colorado River Basins. Typical CBNG development requires the production of relatively high quantities of water (as compared to conventional gas or oil production). Anticipated volumes from potential CBNG projects are difficult to anticipate because most of the projects are at the pilot or exploratory stage and differences in regional and geographic targets exist. Water disposal needs and options for disposal are evaluated in the water quality, watershed, and soils section, including a discussion of impacts from water disposal options by alternative.

There are no known economically viable locatable mineral deposits other than uranium within the RMPPA. If new deposits of locatable minerals are found and become economically viable for traditional mining techniques, they would involve the use of vehicles and heavy equipment, and potentially de-watering operations. These types of projects are regulated with the State of Wyoming and would involve planning for public land use by BLM. There are currently 3 approved plans of operation and one approved notice to explore for and delineate uranium ore bodies. Uranium exploration using in situ techniques, etc., would potentially impact the quality of groundwater resources. In-situ projects may have spills, accidents, and leaks and, if unaddressed, would contaminate groundwater and soil resources. State permitting generally requires the groundwater resources to be in as good as or better than the current conditions for in-situ exploration project to occur. Site-specific mitigation requirements for any locatable mineral exploration and reclamation of areas disturbed would reduce the long-term impacts on water and soil resources.

The discretionary disposal of 21 million tons of mineral materials, such as sand and gravel, under current contracts over the next 10 years would potentially have soil and water impacts that include increased localized erosion, sedimentation in streams and rivers, channelization, and ponding of surface runoff. Construction and maintenance of access routes and roads for mineral development would potentially increase surface runoff or cause erosion near the roads, depending on the implementation and effectiveness of BMPs. Some current contracts are in recently deposited alluvium and, therefore, would potentially occur in floodplains or adjacent to them. Avoidance areas for soil and water resources include 500 ft. from open water and wetlands, as well as any identified 100 year floodplains; if these areas cannot be avoided, impacts must be mitigated. If mineral materials disposal activities would be detrimental to water quality and watershed health, the design would be evaluated to determine if changes in methods, road routes or design would mitigate impacts (Appendix 1, Appendix 13, and Appendix 15). If impacts to soil and water resources cannot be mitigated, projects would not be approved.

OHV Management

OHV use in areas limited to existing roads and vehicle routes would result in localized soil compaction; vegetation removal, especially on roads or routes that have not been used recently; and bank instability from stream crossing or vehicle routes are near waterbodies, thereby increasing erosion and sedimentation loads to streams and rivers. OHV use during periods of high soil moisture conditions would accelerate localized erosion and would result in road and vegetation damage in some areas. OHV use to retrieve wildlife kills and access campsites would be allowed and would cause vegetation and soil damage in some areas, contributing to localized erosion from pioneered vehicle routes. Undeveloped campsites that receive repeated use can result in damage to vegetation in floodplains and increased erosion. As these areas with resource problems are identified, temporary, seasonal, or permanent closures to motorized vehicle use would be employed for public health and safety concerns or for the protection of resources.

Motorized vehicle use in the Dune Ponds Cooperative Management Area (3,730 acres) would be limited to existing roads and vehicle routes and non-vegetated active dunes. Impacts to soil and water resources would be limited to the redistribution of sands, possibly reducing areas within these active dune areas that would become vegetated without this OHV use.

Paleontology Resource Management

Excavations associated with the scientific collection of vertebrate fossils by qualified paleontologists using permits would cause local and short-term (1–5 years) surface disturbance, soil compaction, and vegetation removal on a minimal scale. There is an average of about one of these projects per year and the disturbance is typically less than 1 acre. Hobby collecting of common invertebrate or plant fossils by the public in reasonable quantities using hand tools would be allowed. There would be local surface disturbance associated with collection and vehicle use to access locations on existing roads and vehicle routes. Impacts are not likely to be significant because of the limited nature of these activities and the localized nature of paleontological resources, and because appropriate mitigation measures would be applied to permits for scientific collection of vertebrate fossils.

Recreation Resource Management

NSO stipulations on oil and gas resource leases in recreation sites would limit surface disturbance in these areas (9,660 acres). Four of the nine recreation sites are along the North Platte River (Map 3-7), and another three are near waterbodies. These areas have no or low oil and gas potential and are not currently leased, so exploration and development of oil and gas resources in or near these areas are unlikely to occur. If oil and gas resources were identified in these areas, the NSO stipulation and intensive management 1/4 mile around these areas would require mitigations or designs that would result in minimal impacts to the recreational value of these areas. Because seven out of nine of these sites are developed near waterbodies, fewer surface impacts from oil and gas exploration and development in these areas would reduce direct impacts to these waterbodies from non-point source pollution caused by erosion and surface disturbance.

Special Designations/Management Areas

SD/MAs, such as ACECs, NNLs, and WSAs, would in most cases help protect water and soil resources. The Upper Muddy Creek Watershed SD/MA has the most potential impacts to water resources because there are stream segments within or below the SD/MA boundaries listed with threats on Wyoming's 303d list (Appendix 11). Public lands in and upstream of reintroduction areas for Colorado River cutthroat trout (4,520 acres) would be unsuitable for further coal leasing. If it was allowed, coal development in these areas would involve dewatering of coal formations and surface or subsurface removal of coal. Mitigation for mining activities includes reclamation of disturbed lands and planned disposal of produced water. However, impacts from mining these activities would likely be significant because of the sensitive nature of these watersheds. Rehabilitation of degraded stream reaches would take place to address specific problem areas for fish habitat or other resource concerns. Rehabilitation activities would have short-term impacts on water quality as the stream channel adjusts to in-channel structures that would be used to control vertical and lateral channel erosion. Some wetland and riparian disturbance would be expected; however, activities would be designed to have long-term benefits to soil and water resources.

River segments that have been identified as eligible for WSR designation (140 miles) would be protected for their outstandingly remarkable values, free-flowing nature, and tentative classification. The segments considered eligible are shown in Map 2-20. Most notable are Muddy Creek and Littlefield Creek (92.1 river miles on BLM lands); projects that might change the free-flowing nature of Muddy or Littlefield Creeks, such as impoundments, crossings, fish barriers, etc., would have to be considered with regard to

eligibility. Section 8351.32C of the WSR Policy states that "eligible river segments cannot be modified to allow stream impoundments, diversions, channelization, and/or rip-rapping to the extent BLM is authorized under law." Maintaining the eligibility of these segments would limit projects in these river segments and thereby protect water quality, hydrologic processes, and watershed values of these river segments.

Transportation and Access Management

Transportation actions would pursue opportunities to acquire or maintain legal access, consolidation of public lands would be pursued in some areas, and road densities would not be restricted (Table 2-8). With the consolidation of lands and new access easements acquired from private land owners, the BLM road network could increase under this alternative.

An estimated 120 miles of roads would be maintained for the existing BLM road network and would provide access to campgrounds, fence maintenance, forestry actions, livestock management actions, day use areas, river access, or other resources on public lands. Road maintenance would disturb soil and vegetation along the road ROW and decrease infiltration during road-grading activities, which would increase surface runoff and soil erosion until these non-traveled areas are reclaimed. Road maintenance requires the rebuilding of a road surface that would adequately drain precipitation, typically crowned or outsloped with collection ditches for water shed from the road surface, and a way to convey this concentrated water to non-erosive dissipation structure (Appendix 13).

Increasing access to some areas that currently do not have public access could indirectly increase recreational use of these areas and would result in more use of unimproved vehicle routes in these areas. These activities would contribute to localized erosion in some areas.

Vegetation Management

Vegetation management actions would control noxious and invasive plant species and minimize the disturbance to vegetation through application of BMPs, which would reduce erosion and non-point source pollution from surface disturbance. Managing riparian and wetland areas to meet Proper Functioning Condition (PFC) as part of Wyoming Standards for Healthy Rangeland would assure wetlands are not declining and would be able to withstand flood events. Healthy wetland/riparian vegetation decreases bank erosion and serves as a filter to remove and recycle nutrients, remove chemical and organic wastes, and reduce sediment loads reaching streams and water sources. Vegetation management on the uplands would also improve watershed health by improving the vigor of native plants and increasing surface cover, which decreases rainfall impact and overland flow rates.

Landscape scale vegetation treatments (including prescribed fire and chemical treatments), of about 2,500 acres per year or 50,000 acres over 20 years (less than 1.5 percent of the RMPPA), would have short-term impacts (1–5 years) on water and soil resources. These impacts would include increased localized erosion, changes in water quality, decreased vegetative cover, and changes in surface and subsurface hydrology. Mitigations, such as timing, and location of the treatments would minimize these impacts. Prescribed burning would generally have a long-term indirect improvement for water quality and watershed health. Indirect impacts to water and soils resource from these activities would be to improve vegetation health by establishing a diverse type and age class of vegetation and by reducing fuel loading and, thereby, decreasing the risk of wildland fire. In localized areas, erosion and non-point source pollution would occur as a result of loss of canopy cover during prescribed burns. Water quality problems and peak flows would be likely to occur in large treatment areas in the first 2 years following prescribed fire (Lange 2001). The magnitude of prescribed fire impacts would depend on the soil type, amount of area burned, intensity and severity of fire, and rate of revegetation.

Water Quality, Watershed, and Soils Management

Authorizing surface discharge of produced water during natural gas or oil extraction would change the physical hydrology of receiving waters, change the geomorphology of stream channels, impact water quality, and possibly create additional temporary water sources or evaporation/percolation pits that would require reclamation upon project completion. Water management plans for surface discharges would address reclamation strategies, and would likely require monitoring to assess impacts. WYPDES permits would be required by the State of Wyoming and prevent water quality changes beyond the designated uses of receiving waters, including discharges above Class 1 waters (Section 3.17). Surface discharge of produced water from minerals extraction that meets state standards for water quality (i.e., approved WYPDES permit) would be considered for approval anywhere within the RMPPA. Produced water from natural gas reservoirs located in coal formations (CBNG) can result in the production of high volumes of water, compared with conventional natural gas or oil production. Produced water quality from coal formations within the RMPPA have ranged from 400 milligrams per liter (mg/L) to 7,000 mg/L of total dissolved solids (TDS). Although unusual, produced water from mineral extraction can have as much as 30,000 mg/L TDS.

As part of the project-specific NEPA for CBNG projects, hydrologic investigations would be conducted before extensive CBNG development to determine potential connections to aquifers or surface waters and the coal formation that would be dewatered (Appendix 11). Hydrologic investigations would include an evaluation of potential impacts to other groundwater resources, such as aquifers that could be used for drinking water supplies or stock watering now or in the future. Monitoring wells would likely be established and water quality sampling for isotopic analysis and/or groundwater modeling would likely be conducted to assess the impacts of production wells, depending on the scale of the project considered.

Produced water disposal options are highly dependent on water quality and economics (USDI, BLM 2003b). Options for handling CBNG produced water in the North Platte and Great Divide Basins are (1) reinjection of produced water to the subsurface, (2) discharge of water to perennial systems, (3) surface discharge into ephemeral channels, and (4) discharge into evaporation/percolation pits. Treatment systems may be required before discharging produced waters, depending on the conditions of WYPDES permits. Options for handling CBNG-produced water in the Colorado River Basin are limited by the Colorado River Salinity Control Forum (Appendix 11) to (1) reinjection of produced water to the subsurface, (2) treatment to less than 500 mg/l TDS and discharge under a freshwater waiver, (3) surface discharge accompanied by salinity offset projects (salt banking), (4) discharge into evaporation/percolation pits, and (5) discharges greater than 500 mg/L but less than 1 ton salt/day/field development.

Impacts to water and soil resources from CBNG development would largely depend on water disposal options selected during planning and project specific conditions. However, the types of potential impacts can be identified as outlined below. However, this list is not meant to be comprehensive; any water disposal method not identified above would have to be evaluated and considered in the future during project-specific NEPA.

Reinjection of produced water to the subsurface would result in groundwater mounding and/or increased pressures within the injection zone, potential loss of beneficial uses of produced water, and water quality changes in the receiving aquifer. Wyoming Oil and Gas Conservation Commission (WOGCC) permits deep injection wells and evaluates fracing pressures (if injection pressures are too great, fractures through the overlying strata or confining zone could enable the injection fluid or formation fluid to enter the fresh water strata). The WOGCC typically requires pressure tests as part of permitting to limit this possibility. WDEQ regulates conjunctive use and shallow aquifer recharge systems.

Treatment and/or surface discharge of water to perennial systems would result in surface disturbance from the treatment site and pipelines or other infrastructure construction needed to convey the water to discharge points. Treatments would be specified by the WDEQ in WYPDES permits. Types of impacts include changes to water quality, and downstream impacts may occur to aquatic resources, depending on volumes, water sources, and/or irrigation uses. Changes to geomorphologic characteristics of receiving perennial systems and changes in temperatures (depending on the treatment system) could occur and may alter riparian systems in some areas, depending on volumes of water released.

Treatment and/or surface discharge into ephemeral channels would change the geomorphologic characteristics of receiving ephemeral systems and result in the loss and/or gain of wetland/riparian features in these channels. Erosion, including gulley formation, and lateral and vertical adjustments in ephemeral channels would likely occur in some locations. Increased loading of downstream perennial systems with sediment and/or salts caused by changes in water quality during conveyance would occur.

Discharge into evaporation/percolation pits or reservoirs would include potential contamination of shallow aquifers or the water table with CBNG water, concentration of salts in soils underlying the pit or reservoir, problems with winter operations (freezing pipes), and evapoconcentration of dissolved constituents.

Freshwater waivers and offset surface discharges in the Colorado River system are types of industrial discharge permits for produced waters that are allowed by the Colorado River Salinity Control Forum and may be permitted by WDEQ. Surface discharges under these programs have the same types of impacts as described in items 2 and 3. Freshwater waivers are currently defined as surface discharges of waters with less than 500 mg/L TDS and are allowed without volume restrictions (Appendix 11).

Reservoirs, spring developments and other water resource development projects would result in surface water depletions within the Muddy Creek watershed (Map 2-20) and would be approved if the depletions are mitigated for the Colorado River downstream of the confluence of Muddy Creek and Little Snake River in accordance with the recovery program described in Appendix 11. New and existing reservoirs with local depletions of greater than 1 acre-foot of water per year would attenuate peak flows important for channel maintenance and would adversely affect flow conditions important for native fish communities downstream. These projects would also result in surface disturbance during construction and maintenance, conversion of surface run-off to groundwater through increased infiltration, and increased water loss caused by evaporation from the surface. Reservoirs with surface areas of 2 acres or greater would result in more that 1 acre-foot of evaporation per month in the summer (Appendix 11). If catastrophic failure of reservoirs occur (storm events in excess of the predicted or design storms), major channel erosion would occur, along with flooding downstream caused by the immediate release of the pooled water. If reservoir failure were to occur, sediment transport would reduce water quality downstream, by increasing turbidity and depositing sediment in pools and riffles, compromising habitat important for aquatic species.

Portions of the Encampment River Watershed would be protected by the Wild and Scenic River-eligible segment of the Encampment River and by the Encampment River Canyon WSA, which would result in no additional protection measures. See the special designations/management areas discussion.

Wild Horse Management

Grazing of wild horses within designated HMAs at specified AMLs would result in grazing and hoof damage to soils and vegetation important for watershed function in some areas within the HMA. Soil compaction and surface disturbance can be expected around water sources because many of the HMAs

are located in arid areas and have few water sources. These impacts are not expected to exceed standards for healthy rangeland and would be evaluated regularly with regard to population levels.

Wildlife and Fish Management

Wildlife and fish habitat management actions that intensively manage surface disturbing activities would generally be designed to improve wildlife and fish habitat and indirectly involve the protection of water sources and the promotion of diverse plant communities. Diverse plant communities would mean different age classes and types of vegetation (i.e., shrubs, forbs, and grass) and are generally better able to slow and filter overland flow, reduce erosive forces, and improve water quality. Intensive management for wildlife habitat would generally result in more plant cover; less bare ground; more diverse structure, which would reduce rain splash erosion, decrease overland flow, and reduce channel erosion; and less sedimentation and nutrient loading downstream.

Impoundments, instream structures and stream crossings would be designed for fish management objectives, when possible. This would mean that designs would not necessarily provide for natural stream process favorable to fish passage. Culverts or other methods may be more likely under this alternative; however, water quality, watershed, and soils management actions would still require mitigation of project designs to reduce impacts to water resources from these types of structures (Appendix 13).

Summary

Water quality, watershed, and soils resources are susceptible to compounded impacts from multiple BLM program activities, which cause surface-disturbance and/or water quality degradation. The combined input from surface disturbing activities on a watershed scale would at some point and in some locations degrade water quality beyond the designated use of receiving waterbodies or contribute to the listing of 303d reaches. Impacts resulting from drill pad, access road, facility site, and pipeline ROW construction would include removal of vegetation, exposure of the soil, mixing of soil horizons, soil compaction, loss of topsoil productivity, and increased susceptibility of the soil to wind and water erosion. These impacts could increase runoff, erosion, and offsite sedimentation.

Impacts to streamflow characteristics, water quality, and alteration of stream channel geometry as a result of surface discharge of produced water from oil and gas activities are most likely to occur in the Colorado River Basin or in the North Platte above Seminoe Reservoir. Overall, these impacts from surface discharge of produced water and surface disturbing activities from minerals development would result in significant impacts to surface water quality and watersheds.

Diminished groundwater resources would affect designated water sources in some locations as a result of CBNG development’s impact to wells, seeps and springs. Impacts to soil and groundwater quality would potentially occur from drilling fluids or spills.

Soil disturbing activities would result in significant impacts to soils. Localized disturbance and a regional increase in development would result in soil loss above what would be naturally replaced on a yearly basis after reclamation.

4.17.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Management actions resulting from air and socioeconomics management are not likely to impact water quality, watershed, and soils management. Impacts resulting from cultural resource management, lands and realty management, OHV use, paleontology management, transportation and access management,

water quality, watershed, and soils management, wild horse management, wildlife and fishery management, and visual resource management would be the same as those described for Alternative 1.

Fire and Fuels Management

Fire and fuels management would emphasize suppression of wildland fire resulting in fewer acres burned by wildland fire in the short term. However, with an emphasis on suppression, this alternative would increase the probability of large watershed-damaging fires over the long term. Suppression of wildland fires in most cases would result in an accumulation of fuels and an increase in late-seral vegetation communities that are more prone to watershed damaging wildland fires. Wildland fires reduce canopy and ground cover, thereby exposing soils to wind and water erosion and increased runoff potential, and would adversely affect soil's physical properties, such as reducing infiltration in some cases. Wildland fire would increase sediment loading and change downstream water quality depending on the severity of the fire and location within the watershed. Evapotranspiration and other hydrologic cycles would also be altered in some locations because of increases in late-seral vegetation that would result from wildland fire suppression. Late-seral communities progressively dominate landscapes because of fire exclusion, and these landscapes are especially vulnerable to adverse changes in the hydrology when stand-replacement wildland fires inevitably occur (Keane et al. 2002).

Greater fire suppression efforts would result in increased disturbance from suppression activities such as building fire lines, which create preferential flow paths and localized erosion; however, suppression impacts are insignificant as compared to impacts from large wildland fires (Section 4.17.1). Fuel reduction treatments would average 500 acres/year as compared to 100 acres/year with Alternative 1. Treatments would result in 1–2 year changes in water quality and increased surface runoff in some locations, but would likely benefit watershed conditions in the long term. Even with the increase in acreage of treatments, and an emphasis on suppression of wildland fires regardless of location or ignition source, there would likely be an increase in large stand replacing wildland fires in 15–50 years.

Forest Management

Forest resources management actions would be similar to those described for Alternative 1, except that there would be a focus on commercial timber harvest instead of natural processes and the harvest expected to be twice as much (in board feet). The size of individual harvest areas is expected to be larger because the acreage allowed for individual clear-cuts and select cuts is 10 times the size as under Alternative 1. Commercial treatments would be used primarily instead of natural process to achieve forest health objectives. This action would require more aggressive management and would likely require the use of more roads and offroad vehicle use. Human disturbances in remote areas that would have been treated with natural processes under other alternatives are likely to increase. Therefore impacts from roads and disturbance would likely increase in some locations from those described in Alternative 1. Mitigation and BMPs would still be applied to forest management activities to reduce these impacts where possible.

Livestock Grazing Management

Livestock grazing management would result in grazing systems and range improvements implemented to maximize livestock production (such as increased weight gain of cattle and improving grazing distribution). Impacts would be the similar to those described under Alternative 1. Range improvement projects would focus on improved distribution of livestock, in part through an increase in the number of water developments. An additional 4 pits or reservoirs (50-percent increase) per year would be constructed, leading to 300 pits or reservoirs over 20 years. Construction of range improvements would disturb about 1,140 acres over 20 years. The immediate area around range improvements would be subjected to erosion resulting from construction and livestock concentrations.

Minerals Management

Minerals management actions for oil and gas activities would result in approximately 63,649 acres of short-term surface disturbance and 17,013 acres of long-term surface disturbance. Impacts would be similar to those described in Alternative 1; however, the magnitude of impacts would be slightly larger. Reclamation procedures and the application of BMPs would still reduce the long-term impacts on water and soil resources, such as increased erosion and surface runoff (Appendixes 1, 13 and 15). Even with successful reclamation and full implementation of BMPs, minerals management actions in would lead to direct impacts to water and soil resources and these impacts would be significant in some areas.

Minerals management activities for locatable mineral entry would result in approximately 6,400 acres closed to locatable mineral entry, as opposed to 63,670 acres under Alternative 1. Closing these areas to locatable mineral entry would prevent impacts described in Alternative 1, such as increased erosion, sedimentation in streams and rivers, channelization, and ponding of surface runoff on these lands. The amount of mineral material disposals is expected to be higher under this alternative (5-percent more per year); however, the impacts are expected to be similar to those described in Alternative 1.

Recreation Management

Impacts from recreation management would be similar to those identified in Alternative 1, except the establishment of an OHV SRMA would result in soil compaction and removal of vegetation and contribute increased sediment loss. The SRMA would likely be bermed or have other mitigation implemented to contain erosion and prevent downstream water quality degradation.

Special Designations/Management Areas

SD/MAs, such as ACECs, NNLs, and WSAs, would in most cases help protect water and soil resources. Special designation/management area management would be similar to Alternative 1, except there would be greater opportunity for impacts from surface disturbance activities as a result of less restrictive management. For example, none of the 140 miles of river segments considered eligible for wild and scenic designation would be managed for the values identified. Increased amount of surface disturbance in these areas would result in increases in surface runoff and erosional process and result in higher sediment loads downstream.

Vegetation Management

Vegetation management would use vegetation treatments such as chemical, mechanical, or prescribed fire for the benefit of commodity production (livestock grazing). Vegetation treatments would occur on about 24,400 acres per year or 488,000 acres (less than 14 percent of the RMPPA) over 20 years. These treatments would result in more homogenous disturbance and therefore would be more susceptible to erosion. However, vegetation treatments would result in increased herbaceous cover and reduced erosion rates that would extend from 10–50 years after the treatment.

Summary

Water quality, watershed, and soils resources are susceptible to compounded impacts from multiple BLM program activities, which cause surface disturbance and/or water quality degradation. Under Alternative 2, the combined input from surface disturbing activities on a watershed scale would at some point and in some locations degrade water quality beyond the designated use of receiving waterbodies. As with Alternative 1, drill pad, access road, facility site, and pipeline ROW construction would include removal of vegetation, exposure of the soil, mixing of soil horizons, soil compaction, loss of topsoil productivity, and increased susceptibility of the soil to wind and water erosion. These impacts could

increase runoff, erosion, and offsite sedimentation. Because of the increase in surface disturbance from oil and gas development, the potential to contribute to the listing or continued listing of a threatened or impaired waterbody on the 303d list is likely under Alternative 2 when compared with the other alternatives.

Impacts to streamflow characteristics, water quality, and alteration of stream channel geometry as result of surface discharge of produced water from oil and gas activities are most likely to occur in the Colorado River Basin or in the North Platte above Seminoe Reservoir. Overall, these impacts from surface discharge of produced water and surface disturbing activities from minerals development would result in significant impacts to surface water quality and watersheds under this alternative.

Diminished groundwater resources would affect designated water sources in some locations as a result of CBNG development's impact to wells, seeps, and springs. Impacts to soil and groundwater quality would potentially occur from drilling fluids or spills.

Soil disturbing activities would result in significant impacts to soils. Localized disturbance and a regional increase in development would result in soil loss above what would be naturally replaced on a yearly basis.

4.17.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Management actions resulting from air and socioeconomics management are not likely to affect water quality, watershed, and soils management. Impacts resulting from paleontology management, recreation management, wild horse management, and visual resource management would be the same as those found in Alternative 1.

Cultural Resource Management

Cultural resource management impacts would be similar to those described under Alternative 1, except the surface disturbance would not be allowed within 1/4 mile or the visual horizon, whichever is closer, of the cultural resources if the historic setting contributes to NRHP eligibility. Because the mitigation measures are more restrictive under this alternative, it is possible that projects might need to be relocated in areas that are sensitive from a soils or watershed perspective.

Fire and Fuels Management

Fire and fuels management would emphasize natural processes, resulting in more acres burned by wildland fire during the planning period (see impacts common to all). Approximately 212,000 acres over 20 years would be disturbed by fire management actions. This alternative would result in less accumulation of fuels than would Alternative 1 and would eventually decrease the likelihood of high-intensity watershed-damaging wildland fires.

Forest Management

Forest resources management would emphasize natural processes to achieve forest health goals. Commercial timber harvesting would not be allowed. Management actions on 28,500 acres of commercial forestlands would be allowed to enhance forest health and meet public demand for minor wood products, which would reduce the impacts from road construction on water quality and watersheds.

Lands and Realty Management

Lands and realty management, including wind energy facilities, utility facilities, transportation systems, and communication sites, would avoid certain areas (Map 2-32). Additional areas would be closed to utility/transportation systems and wind energy avoidance areas (Table 2-5). Impacts from lands and realty management are expected to be less extensive than those described in Alternative 1.

Livestock Grazing Management

Livestock grazing management impacts would be similar to those of Alternative 1, except grazing systems and range improvements would be implemented to enhance wildlife, watershed, and riparian values, instead of designing improvements to achieve livestock management objectives. Actions to enhance watershed and riparian values would reduce erosion and sediment loading to nearby streams, maintain adequate vegetative cover, and enhance soil productivity. Meeting DPC objectives would result in improved site-specific management; improve soils health and watershed function. Construction of range improvements would disturb about 420 acres over 20 years, with a focus on spring developments which typically include the protection of the spring source and a minor water use. These spring developments typically improve wetland function below springs and, therefore, would indirectly improve watershed function. Range improvement projects would not include reservoir/pit or pipeline construction for livestock water; this would result in more concentrated livestock use in specific areas, increasing livestock grazing impacts in localized areas, but with less surface disturbance and changes in hydrology from reservoirs and pits.

Minerals Management

Minerals management actions for oil and gas management would provide the greatest protection of water and soil resources. Oil and gas management actions would result in approximately 56,505 acres of short-term surface disturbance and 15,489 acres of long-term surface disturbance. Impacts would be similar to those described in Alternative 1; however the magnitude of impacts would be slightly lower. The acreage of disturbance is similar to Alternative 1 because of the assumption that development would continue without reductions on private and state lands; therefore, even with a significant decrease of development on federal lands, the development on private and state lands would still constitute significant disturbance. Reclamation procedures and the application of BMPs would reduce the long-term impacts on water and soil resources, such as increased erosion and surface runoff (Appendix 1, Appendix 13, and Appendix 15). Even with successful reclamation and full implementation of BMPs, minerals management actions would lead to direct impacts to water and soil resources, and these impacts would be significant in some areas.

Minerals management actions would close approximately 402,280 acres to locatable mineral entry as, opposed to 8,105 acres under Alternative 1. Closing these areas to locatable mineral entry would prevent impacts, such as increased erosion, sedimentation in streams and rivers, channelization, and ponding of surface runoff on these lands. However, impacts would be similar to those described in Alternative 1 because historic and projected production from locatable minerals is negligible (25 acres/year). The discretionary disposal of material minerals would be about ¾ of the amount described in Alternative 1; however, impacts are expected to be similar.

OHV Management

OHV management impacts would be similar to those of Alternative 1, except OHV use would be restricted to designated roads, more areas would be closed to OHV use (Map 2-43) and vehicle routes to access campsites or retrieve wildlife kills, and there would be no areas designated as open to OHV use.

This would most likely result in fewer pioneered roads and vehicle routes, thereby reducing localized erosion.

Special Designations/Management Areas

SD/MAs, such as ACECs, NNLs, and WSAs would in most cases help protect water and soil resources. SD/MA management impacts would be similar to those of Alternative 1, except there would be less surface disturbance as a result of more restrictive management for many of the existing and proposed SD/MAs. For example, all the river segments (140 miles) would be managed as suitable for eligibility in the National Wild and Scenic Rivers System. (See impacts described under Alternative 1; protection measures would be similar). Additional protection for these WSRs would include closing these areas (1/4 mile from stream) to OHV use and oil and gas leasing, and would be recommended for withdrawal from mineral entry. Increased protection of water and soil resources would result from restrictions placed on surface disturbing activities because a greater amount of land area would be subject to NSO requirements, closed to oil and gas development, closed to locatable mineral entry, and have limited OHV use. Management actions that limit the extent of surface disturbing activities would help minimize erosion, sediment loading to waterways, compaction of soils, loss of soil productivity, and reduction of vegetation.

The Historical Trails ACEC contains contributing segments that would restrict surface disturbance within 1/4 mile of the trail under this alternative. The Overland Trail follows Muddy Creek for about 10–15 miles and crosses the creek periodically. Restricting surface disturbance in this portion of the Historical Trails ACEC would protect the federal sections of the contributing portions of the trail from direct impacts from construction of road, well pad, and other facilities, and reduce non-point source pollution to Muddy Creek.

Special management for the Muddy Creek watershed would limit road density and manage the areas within 1/4 mile of ephemeral and perennial streams as avoidance areas. These actions would result in less acreage of surface disturbance and would not degrade water quality. Impoundments and instream structures would be removed or modified where negative effects on habitat quality, habitat quantity, or the life history requirements of populations of Special Status fish species would occur. This action would result in increases in sediment loads in the short term, but projects would be designed to return original sediment transport conditions in the long term.

Special management for the Encampment River Potential WSR would extend to the visual horizon above the river; however, the average buffer would be less than 1/4 mile. This would provide some additional protection for water quality and watershed health, particularly if Congress releases the WSA from wilderness consideration.

Transportation and Access Management

Transportation and access management impacts would be similar to those of Alternative 1, except the priorities for access would be different. For example, the Rawlins Uplift and Continental Divide Trail would be areas of high importance (Table 2-8). Access to these areas would allow for maintenance of existing trails, or the definition and improvement of routes. These actions would reduce existing impacts from poorly designed trails and improve maintenance where these trails exist.

Transportation and access management actions include not allowing road densities to exceed levels that diminish or adversely affect other resources. Impacts would be similar to Alternative 1. Not all vehicle routes are in the best location from a surface hydrology perspective; they can be at grades that are not maintainable or in a poor location because of their origins in minerals surveys or because they were built or pioneered for a certain purpose and may now be put to a new use. Since minerals production would

occur on a similar scale as under other alternatives, this action may increase impacts from roads in some locations. However, if unneeded roads are closed and reclaimed in favor of new routes that are better designed, this alternative could significantly reduce impacts from new roads. It is important to note these impacts would only occur on public lands and would be difficult to administer in mixed land owner patterns such as the checkerboard.

Vegetation Management

Vegetation management would use vegetation treatments, such as biological treatments or prescribed fire, to meet multiple-use objectives with emphasis on Special Status Species. Vegetation treatments would occur on 11,800 acres per year or 236,000 acres over 20 years. These treatments would result in more heterogeneous disturbance (mosaic patterns) and therefore the areas would be less likely to experience erosion. Increased erosion would occur on the borders of prescribed fires as a result of a greater number of containment fire lines needed for the smaller treatment units.

Water Quality, Watershed, and Soils Management

Water quality, watershed, and soils management actions would include requiring produced water from federal leases to be injected in the Colorado River Basin. Produced water in the North Platte and Great Divide Basins could be surface discharged if it met specific BLM resource management objectives. In the North Platte and Great Divide Basins, the emphasis on meeting BLM resource objectives would require development of more water management infrastructure, such as pipelines, impoundments, water tanks, troughs, and/or created wetlands. This infrastructure would require additional efforts to provide water sources after oil and gas production ceases. These restrictions on the disposal of produced water would generally maintain or enhance existing water quality and natural hydrological conditions. Management actions (e.g., surface disposal of produced water from oil and gas activities, impoundment of water, and surface disturbing activities) that result in salt loading to the Colorado River system would not be allowed. This management action would maintain water quality and watershed health by preventing salts from contaminating waterbodies maintaining salt loading in the Colorado River system.

Water quality, watershed and soils management actions in the Muddy Creek watershed (USGS HUC 14050004; Map 2-20), would not allow water impoundments that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek. This action would maintain current flow conditions in the Muddy Creek watershed and would result in fewer changes to flow conditions in the Colorado River system (Map 2-20).

Water quality, watershed, and soils management actions for the Encampment River watershed (USGS HUC 1018000205) would protect municipal drinking water sources. These actions are designed to maintain current water quality characteristics of surface waters used as drinking water sources by towns in the Upper North Platte River valley (Map 2-20).

Wildlife and Fish Management

Wildlife management actions would place priority on meeting DPC in waterfowl habitats, which would improve wetland/riparian areas, vegetative cover, and soil productivity, and thereby enhance watershed health. Actions to improve wildlife and fish habitat involve the protection of water sources and the promotion of diverse plant communities that are better able to slow and filter overland flow, reduce erosive forces, and improve water quality. These actions would affect natural water resources by lessening surface disturbance and reducing the potential for soil erosion and sediment loading.

Surface disturbance would not be allowed in avoidance areas for water resources (Table 2-1) to protect amphibians, in prairie dog towns, in identified crucial habitat for sensitive species, and within 1/4 mile of grouse leks. No surface disturbance in these areas would maintain vegetation cover and natural soil conditions. In some cases, infrastructure would be displaced to alternate locations that may result in new impacts to soil and water resources. For example, moving drilling locations to avoid grouse leks may increase road length and therefore would increase surface disturbance and erosion associated with this activity.

Wildlife and fish management actions would include designing road crossings in drainages that potentially support fish so that they do not alter natural stream processes. Maintaining unimpeded flows would result in maintenance of water quality and riparian function.

Wildlife and fish management actions include only building impoundments and instream structures that maintain or improve habitat quality, habitat quantity, or the life history requirements of populations of Special Status fish species. This action would not significantly alter current flow and sediment transport conditions, but would include temporary increases in sediment loads if structures were removed to meet fish management goals.

Summary

Water quality, watershed, and soils resources are susceptible to compounded impacts from multiple BLM program activities, which cause surface disturbance or water quality degradation. Under Alternative 3, the combined input from surface disturbing activities on a watershed scale would at some point and in some locations degrade water quality beyond the designated use of receiving waterbodies. These impacts are most likely to occur as a result of minerals development and other surface disturbing activities. Because the discharges of produced water from minerals actions from federal leases would be limited in the North Platte River Basin and restricted to injection in the Colorado River Basin, there is likely to be only minor impact on water quality as a result of the discharge of produced water from oil and gas activities.

Soil disturbing activities would result in significant impacts to soils. Localized disturbance and regional areas with increased development would result in soil loss greater than what would be naturally replaced on a yearly basis.

4.17.5 Impacts Under Alternative 4: Proposed Plan

Management actions resulting from air and socioeconomics management are not likely to impact water quality, watershed, and soils management. Impacts from fire and fuels management, paleontology management, and wild horses management would be the same or similar to those described in Alternative 1.

Cultural Resource Management

Cultural resource management impacts would be the same as those of Alternative 3.

Forest Management

Forest management impacts would be the same as Alternative 1, except a total of 21,813 acres, or 6,700 acres less than Alternative 1, would be available for harvest of commercial wood product. Changes in surface hydrology and increased erosion in some areas would result from temporary road improvements to access commercial timber products. Eliminating timber harvest on 6,700 acres of steep slopes and

riparian areas would protect these sensitive areas from erosion and downstream water quality from impacts resulting from commercial timber harvest.

Lands and Realty Management

Lands and realty management actions, including wind energy facilities, utility facilities, transportation systems, and communication sites, would avoid certain areas (Map 2-33). Sensitive areas, with regard to soil and water resources, include slopes greater than 25 percent, identified 100-year floodplains, and areas that are 500 feet from perennial surface water, water wells, springs, wetland/riparian areas, and ephemeral channels (Table 2-5). Construction of facilities in these areas would increase erosion, sediment loading, and runoff and change surface hydrology. If it becomes necessary for facilities to be placed within avoidance areas, effects would be intensively managed, which would reduce short- and long-term impacts. Impacts from lands and realty management are expected to be less extensive than those described for Alternative 1.

Livestock Grazing Management

Livestock grazing management impacts would be similar to those of Alternative 1, except emphasis would be placed on achieving DPC. Construction of range improvements would disturb about 920 acres over 20 years. Range improvement projects would include fence construction and spring and water developments. These actions would improve livestock management and distribution, which reduces sediment loading to nearby streams, improves vegetative cover, and potentially decreases soil erosion.

Minerals Management

Minerals management actions for oil and gas management would provide the greatest protection of water and soil resources. Approximately 57,819 acres of short-term surface disturbance and 15,472 acres of long-term surface disturbance would occur. Impacts would be similar to those described in Alternative 1; however, the magnitude of impacts would be slightly lower. The acreage of disturbance is similar to Alternative 1 because of the assumption that the development would continue without reductions on private and state lands; therefore, even with a significant decrease of development on federal land, the development on private and state lands would still constitute significant disturbance. Reclamation procedures and the application of BMPs would reduce the long-term impacts on water and soil resources, such as increased erosion and surface runoff (Appendix 1, Appendix 13, and Appendix 15). Even with successful reclamation and full implementation of BMPs, minerals management actions would lead to direct impacts to water and soil resources, and these impacts would be significant in some areas.

Minerals management impacts for locatable minerals would be greater than those of Alternative 1. Approximately 16,980 acres would be closed to locatable mineral entry as opposed to 63,670 acres under Alternative 1. Closing these areas to locatable mineral entry would prevent impacts, such as increased erosion, sedimentation in streams and rivers, channelization, and ponding of surface runoff on these lands. However, impacts would be minimal because historic and projected production from locatable minerals is negligible within the RMPPA.

OHV Management

OHV management would allow the use of OHVs on existing or designated roads and vehicle routes and would result in localized soil compaction, vegetation removal, and bank instability, thereby increasing erosion and sedimentation loads to streams and rivers. OHV use during periods of high soil moisture conditions would accelerate localized erosion, increase compaction and runoff, and result in vegetation damage in some areas. OHV use to retrieve wildlife kills and access campsites would be allowed within

300 feet of designated roads and vehicle routes, which would likely result in fewer pioneered roads and vehicle routes and less localized disturbance.

Recreation Management

Impacts from recreation management would be similar to those identified in Alternative 1, except the establishment an OHV SRMA would result in soil compaction and removal of vegetation and contribute increased sediment loss.

Special Designations/Management Areas

SD/MAs, such as ACECs, NNLs, and WSAs, would in most cases help protect water and soil resources. SD/MA impacts would be similar to those of Alternative 1, except there would be less opportunity for surface disturbance as a result of more restrictive management for many of the existing and proposed SD/MAs. Alternative 4 would provide protection to water and soil resources from surface disturbing activities because of the acres subject to NSO requirements, closed to oil and gas development, closed to locatable mineral entry, and limited vehicle use. Management actions that limit the extent of surface disturbing activities would help minimize erosion, sediment loading to waterways, compaction of soils, loss of soil productivity, and reduction of vegetation.

Impacts from historic trail management would be the same as those described in Alternative 3.

The Encampment River within the WSA would be protected for WSR values and would include restrictions on activities that would change the “free-flowing” characteristics of this segment and limit some surface disturbing activities. Management prescriptions would apply within 1/4 mile of the high-water line. This segment of river would be protected from new uses; however, the WSA affords many of the same protections. This area would also be addressed by the Encampment Watershed prescriptions (Water Quality, Watershed, and Soils Management of Table 2-1). All other stream segments identified with potential WSR eligibility would be managed in the same way as other public lands in the RMPPA; impacts would occur in these areas from minerals, forestry, livestock grazing, etc., and are described in each of these sections.

Transportation and Access Management

Transportation and access management actions would be the same as those described in Alternative 3 for increased access and consolidation of public lands. Road densities would be considered during the analysis process at an activity planning level. This alternative could improve the measuring and tracking of road densities and would require this metric to be considered during planning. Impacts would be determined by decision at this activity planning level; however, this action would likely reduce impacts in some watersheds by better analysis.

Vegetation Management

Vegetation management, including treatments, such as mechanical, biological, chemical, and prescribed fire, would be applied to meet Standards for Healthy Rangelands (USDI, BLM 1997), watershed function, and to achieve DPC with consideration for Special Status Species. Vegetation treatments would occur on about 16,400 acres per year or 328,000 acres over 20 years. This emphasis would result in larger treatments and a more heterogeneous disturbance (mosaic patterns). Consequently, these areas would be more likely to experience short-term erosion on some areas. Rangeland areas would be managed to achieve DPC, which would improve soil productivity, reduce potential erosion, improve vegetative cover, and enhance watershed health. For example, increasing willow density and cover for DPC in riparian

areas would improve stream bank stability and provide food and dam-building material for stable beaver colonies, which would also enhance watershed function.

Water Quality, Watershed and Soils Management

Water quality, watershed and soils management impacts would be similar to those described under Alternative 1, except water impoundments in the Upper Muddy Creek/Grizzly WHMA (Map 2-13) that would result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek would not be allowed. Also, management actions for the Encampment River watershed (USGS HUC 1018000205) would protect municipal drinking water sources. These actions would protect the hydrology downstream of projects within Muddy Creek/Grizzly SD/MA and would maintain current water quality characteristics of surface waters used as drinking water sources by the towns in the Upper North Platte River valley (Map 2-20).

Wildlife and Fish Management

Wildlife management actions would place priority on meeting DPC, which would improve wetland/riparian areas, vegetative cover, and soil productivity, and thereby enhance watershed health. Actions to improve wildlife and fish habitat involve the protection of water sources and the promotion of diverse plant communities that are better able to slow and filter overland flow, reduce erosive forces, and improve water quality.

Wildlife management actions would require that road crossings in drainages that potentially support fish for a portion of the year be designed to simulate natural stream processes (Appendix 13). Maintaining unimpeded flows would result in maintenance of water quality and riparian function. Allowing for these unimpeded processes would most likely result in sediment deposition in floodplains and improvements in channel structure that would improve water quality and riparian function in the long term. Impoundments and instream structures would be allowed but designed to minimize impacts, such as changes in water quality and natural hydrological conditions, to Special Status fish species and their habitats.

Summary

Water quality, watershed, and soils resources are susceptible to compounded impacts from multiple BLM program activities, which cause surface disturbance or water quality degradation. Under Alternative 4, the combined input from surface disturbing activities on a watershed scale would at some point and in some locations degrade water quality beyond the designated use of receiving waterbodies. These impacts are most likely to occur in the Colorado River Basin or in the North Platte River Basin above Seminoe Reservoir as a result of minerals development with surface disturbing activities. This potential is less likely under Alternative 4 than under Alternative 1.

Soil disturbing activities would result in significant impacts to soils. Localized disturbance and regional areas with increased development would result in soil loss above what would be naturally replaced on a yearly basis.

4.18 WILD HORSES

This section describes the potential impacts to wild horses and their habitat from other resource programs. The affected environment of wild horses is presented in Section 3.18.

Significance Criteria

Impacts to wild horses would be considered significant if the following were to occur:

- Available forage, water, or other habitat components were not sufficient to achieve or maintain the AML in a given HMA (Map 2-21).
- Viability of wild horse populations cannot be maintained.
- The wild, free-roaming character of a wild horse herd in an HMA was lost.

Methods of Analysis

Impacts on wild horses are generally the result of activities that affect forage, water availability, available habitat, and the wild and free-roaming nature of a herd. Impact analyses and conclusions are based on interdisciplinary team knowledge of resources and the project area, spatial analysis, review of existing literature, and information provided by other agencies. Effects are quantified where possible or described in qualitative terms in the absence of quantitative data.

This analysis is based on the following assumptions:

- The number of wild horses would increase about 18 percent annually and be maintained by periodic removals.
- Wild horse removals (gathers) would occur about every 3 to 4 years in each HMA.
- Maintenance of wild horse populations at AMLs within existing HMAs would be accomplished through removals and selected application of other population control practices.
- Wild horse gathers would use existing trap locations for the most part. About 30 acres have been disturbed from the development of existing traps.
- The amount of livestock use on public lands is anticipated to remain stable at the 10-year average.
- RFDs and RFAs can be found in Appendix 33.

4.18.1 Impacts Common to all Alternatives

Air quality management, paleontology, and SD/MAs other than Historic Trails SD/MA, Continental Divide Scenic Trail SRMA, and Adobe Town WSA would have little or no impacts on wild horses.

Cultural resource management activities, such as inventory, excavation, and monitoring, would create short-term localized impacts to wild horses. The most likely impact to wild horses from such management would be the temporary displacement of wild horses while the management activity occurs at a localized site. Even under the most intense cultural resource management (i.e., excavation), the amount of acreage disturbed would be small relative to the size of HMAs.

Although the woodlands in the RMPPA would remain open to minor wood products, potential impacts to wild horses, if they occur, would be negligible, localized, and restricted to the juniper woodlands in the Adobe Town HMA. The only impacts to wild horses from forest management would be short-term localized displacement from the area of use (post and pole harvest in the juniper woodland).

The impacts of wildland fires would be direct and indirect, and most likely short term and localized. Wildland and prescribed fires would result in a temporary displacement of wild horses and short-term reduction in available forage. However, burned areas would provide improved forage production in the long term and create a mixture of vegetative communities with diverse species, cover, and age classes.

Wildland fire suppression activities, such as fire lines and staging areas, would also result in short-term forage losses. However, these impacts would be negligible and localized, given the limited amount of acreage ultimately disturbed by these activities. In addition, these areas would be reseeded and/or fenced, where necessary, until the vegetation recovers.

The use of wildland fire for resource benefit would increase the size of wildland fires. This increase in size would further decrease short-term forage availability; however, forage availability and diversity would be increased over the long term. Concentration of horses on new growth in wildland fire areas would increase, which would slow the recovery of the vegetation.

As with wildland fire, implementation of fuels management activities would create short- and long-term impacts to wild horses. In the short term, fuels reduction activities would temporarily displace wild horses from a localized area, resulting in a negligible impact. In the long term, fuels reduction treatments, including returning fire to its natural role in the ecosystem, would result in improved forage production for wild horses and other grazing animals.

Direct impacts to wild horses from new utility and transportation system development actions would be negligible and short-term impacts localized to the area of development. Wild horses would be temporarily displaced during any development and maintenance actions and development of new roads. There would be no long-term loss in forage because effects of utility and transportation development would be mitigated by revegetating all disturbed ROWs.

Any extensive development of utility and transportation systems outside existing corridors (described as locations where linear facilities currently exist) would affect the wild and free-roaming nature of wild horses. The increased placement of facilities within HMAs would potentially increase the avoidance of certain areas by wild horses and/or result in acclimation to facilities associated with human activity, thus reducing their wild and free-roaming character. Locating new utility and transportation systems next to existing facilities whenever possible would reduce the potential to fragment wild horse habitat or affect wild horses' wild and free-roaming nature.

Livestock grazing management would result in the maintenance or improvement of range condition, as directed by Standards for Healthy Rangelands (USDI, BLM 1997). There would be direct competition for forage, water and space to wild horses from livestock grazing management; this would occur across each HMA. Dietary overlap is greatest between cattle and wild horses, but sheep also compete for herbaceous forage during spring, summer, and fall. Winter sheep grazing would result in less direct competition with wild horses. Because adjustments to livestock grazing use only occur after monitoring or field evaluations and documentation indicates that such an adjustment is necessary, some isolated cases of increased competition for, or overuse of, forage and water could occur during periods of drought or other adverse conditions, affecting overall productivity within the HMAs. The extent of the competition or overuse, and thereby the intensity of the impacts, would vary based on the time between monitoring findings and adjustments to grazing use. Wild horses would be excluded from riparian habitat where necessary to meet

Standards for Healthy Rangelands (USDI, BLM 1997), which would limit access by wild horses to some water sources and riparian forage. Fencing to improve livestock grazing distribution would affect the wild and free-roaming nature of the horses. Water developments would improve distribution of wild horses within each HMA. Attainment of Standards for Healthy Rangelands (Appendix 8) in upland areas would result in improved plant vigor, production, and diversity of species available as forage for wild horses as well as other grazing animals.

Impacts to wild horses from oil and gas development would range from no impacts in the portions of the HMAs with low or no potential to significant impacts in the portions of the HMAs with known moderate to high potential for oil and gas development. Best management practices mitigation would be used to minimize the impacts of the development, reducing loss of forage and controlling weed infestations. Increased human presence would add to the erosion of the wild and free-roaming nature of the horses.

Geophysical exploration subject to appropriate BMPs, and adherence to State of Wyoming standards for geophysical operations, would result in minor, short-term increased stress, displacement, and disruption of wild horse activities resulting from human presence, noise, equipment, and aircraft present during geophysical activities

Locatable mineral activity has increased in the Red Desert Basin in the past 2 years, which would affect Stewart Creek and Lost Creek HMAs. This activity would cause long-term displacement of horses in mining areas, as well as the associated loss of vegetation. There are currently three approved plans of operation and one approved notice to explore for and delineate ore bodies. All are for uranium. Two are located just west of the Town of Bairoil, and the other two are west of Wamsutter/Crooks Gap Road. No plans for development of the sites have been submitted. Based on recovery costs, any development proposed is expected to involve in situ mining methods. This would result in much less surface disturbance than open-pit methods. In situ mining involves drilling injection wells and recovery wells to extract the ore. Each well pad is designed to minimize disturbance, and reclamation is completed to the extent possible upon completion of the well. The number of wells would depend on the delineation of the ore body. A typical operation would be expected to last 10 to 15 years and be completely reclaimed at the end of mine life. Total acreage involved assuming all operations were conducted at the same time is expected not to exceed 1,000. Best management practices mitigation would be used to minimize the impacts of development.

The potential for mineral material disposals in the area is low because of the lack of suitable deposits. Impacts would not be significant.

Short-term direct impacts to wild horses would be caused by proximity to OHV use, whether recreational OHV use or recreational wild horse observation. Recreational OHV use within HMAs would result in temporary displacement of wild horses from preferred habitats.

Fugitive dust from vehicle use settles on forage adjacent to existing roads, making it unpalatable for consumption until removed by either wind or precipitation. This would reduce the available forage for livestock, wildlife, and wild horses in areas where vehicle traffic is frequent, and increase competition for remaining forage.

Implementation of paleontological resource management activities would create negligible short-term, localized impacts to wild horses. The most likely impact on wild horses from even the most intense management activities (excavation) would be the temporary displacement of wild horses while the management activity occurs at a localized site. The amount of acreage disturbed would be small relative to the size of HMAs.

Recreation management would result in localized short-term impacts. Specifically, wild horses would be temporarily displaced from preferred locations as a result of direct human disturbance, such as recreational wild horse viewing, hiking, hunting, and camping.

The recreational opportunities provided by historic trails and the Continental Divide National Scenic Trail SRMA would encourage recreational use. Such use would cause temporary displacement of wild horses from some preferred foraging areas. Such impacts would be short term and minimal as a result of the limited use these trails receive.

The management of the Historic Trails SD/MA and Adobe Town WSA within the RMPPA would result in localized, minimal impact on HMAs. Two trails—the Rawlins to Fort Washakie historic trail and the Continental Divide National Scenic Trail—transect the Stewart Creek HMA. Two other SD/MAs—the Cherokee historic trail and the Adobe Town WSA—coincide with portions of the Adobe Town HMA. Potential impacts to wild horses resulting from the management of these SD/MAs would be negligible and restricted to the SD/MA and to areas directly adjacent to the historic trails. Restrictions on development in the SD/MAs preclude, restrict, or require mitigation for surface disturbing activities, which would protect vegetation within these areas.

Transportation and access management would have impacts similar to lands and realty and minerals development.

Impacts to wild horses from VRM would be minimal. Available forage for wild horses would not be impacted by development and associated surface disturbance within the Adobe Town WSA because the VRM Class I designation for the Adobe Town WSA precludes development. (the Adobe Town WSA represents only a minor portion of the Adobe Town HMA). The VRM class in the remainder of the Adobe Town HMA and in the Stewart Creek and Lost Creek HMAs is primarily VRM Class III. VRM Class III would not preclude surface disturbing activities or preclude facility placement but would influence the location and design of the facility, which would result in vegetation loss and displacement of horses.

Management actions designed to enhance vegetative conditions would increase vegetative diversity and forage available to wild horses. However, exclosures would potentially reduce wild horse access to riparian habitat. Vegetation treatments and manipulation projects would cause temporary vegetation removal and displacement; however, during the long term, forage production and availability would be enhanced.

The management of Special Status plant species, such as fencing, would affect the wild and free-roaming character of the wild horses and would limit the amount of available forage. However, fenced areas would be relatively small in comparison to the acreage available in the HMAs. Therefore, the impacts would be minimal.

Impacts to wild horses from water quality, watershed, and soils management actions, such as avoiding disturbance near water and soil resources and headcut and conducting stream restoration projects aimed at reducing erosion in watersheds and improving water quality, would provide long-term benefit to wild horses by enhancing habitat and increasing forage production, and would contribute to the attainment of Standards for Healthy Rangelands.

Gathering excess wild horses would result in a reduced amount of resource competition for remaining horses. Gathers would subject all horses to stress and potential injury. The rate of injury has proven to be low (less than 1 percent). Horses removed to maintain AML would be adopted and would lose their wild,

free-roaming nature. The wild horses that remain would have more forage, water, and space available and be healthier, and the remaining population would be more viable.

If wild horse populations are maintained at a level greater than 100 competent breeding adult animals, there should be little (genetic) concern in the short term (USDI, BLM 2001b). Maintenance of AMLs for Adobe Town HMA (700) and Stewart Creek HMA (150), or slight variations to these AMLs as a result of adjustments made following monitoring, would result in the maintenance of genetic viability within these HMAs. Although the meta-population which includes the Lost Creek HMA would exceed this number, the AML in the Lost Creek HMA (70) is not high enough to maintain genetic viability in isolation. As noted in Chapter 3, movement within meta-populations is fairly common.

There is potential that competition for resources between wild horses and big game species would occur. Where there is crucial wildlife range within the HMAs, the impacts to big game species would be most negligible. Management actions to improve wildlife habitat would decrease competition for forage and other habitat components between wildlife and wild horses if improvements took place within any HMA.

4.18.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality management, SD/MAs other than Historic Trails SD/MA, Continental Divide Scenic Trail SRMA, and Adobe Town WSA would have little or no impacts on wild horses.

Limitations on surface disturbing activities on and near cultural sites would result in indirect, minimal impacts to wild horses. Limitations on surface disturbing activities would protect vegetation resources associated with the cultural sites.

Fire and fuels management and recreation management impacts would be the same as those described under Impacts Common to All Alternatives.

Although the woodlands in the RMPPA would remain open to minor wood products, potential impacts to wild horses, if they occur, would be negligible, localized, and restricted to the juniper woodlands in the Adobe Town HMA. The only impacts to wild horses from forest management would be short-term localized displacement from the area of use (post and pole harvest in the juniper woodland).

Direct impacts to wild horses from new utility and transportation system development actions would be negligible and short-term impacts localized to the area of development. Wild horses would be temporarily displaced during any development and maintenance actions and development of new roads. There would be no long-term loss in forage because effects of utility and transportation development would be mitigated by revegetating all disturbed ROWs. Any extensive development of utility and transportation systems outside existing corridors (described as locations where linear facilities currently exist) would affect the wild and free-roaming nature of wild horses. The increased placement of facilities within HMAs would potentially increase the avoidance of certain areas by wild horses and/or result in acclimation to facilities associated with human activity, thus reducing their wild and free-roaming character. Locating new utility and transportation systems next to existing facilities whenever possible would reduce the potential to fragment wild horse habitat or affect wild horses' wild and free-roaming nature.

Livestock grazing management would prescribe range improvements, such as stock ponds and pipelines, which would result in long-term increases in the availability of water and forage available to wild horses and other grazing animals. While the mix of tools available for livestock grazing management would be somewhat more constrained within the HMAs (e.g., consideration of additional fencing), options remain

to ensure attainment of Standards for Healthy Rangelands. In addition, where bison are approved within the HMAs, they would affect the use of water sources and adjacent rangelands by influencing wild horse behavior and use in these locations.

Impacts to wild horses from oil and gas development would range from no impacts in the portions of the HMAs with low or no potential to significant impacts in the portions of the HMAs with known moderate to high potential for oil and gas development. Best management practices mitigation would be used to minimize the impacts of the development, reducing loss of forage and controlling weed infestations. Increased human presence would add to the erosion of the wild and free-roaming nature of the horses.

Geophysical exploration subject to appropriate BMPs, and adherence to State of Wyoming standards for geophysical operations, would result in minor, short-term increased stress, displacement, and disruption of wild horse activities resulting from human presence, noise, equipment, and aircraft present during geophysical activities

Locatable mineral activity has increased in the Red Desert Basin in the past 2 years, which would affect Stewart Creek and Lost Creek HMAs. This activity would cause long-term displacement of horses in mining areas as well as the associated loss of vegetation. There are currently three approved plans of operation and one approved notice to explore for and delineate ore bodies. All are for uranium. Two are located just west of the Town of Bairoil, the other two west of the Wamsutter/Crooks Gap road. No plans for development of the sites have been submitted. Based on recovery costs any development proposed is expected to involve in situ mining methods. This would result in much less surface disturbance than open-pit methods. In situ mining involves drilling injection wells and recovery wells to extract the ore. Each well pad is designed to minimize disturbance and reclamation is completed to the extent possible upon completion of the well. The number of wells would depend on the delineation of the ore body. A typical operation would be expected to last 10–15 years and be completely reclaimed at the end of mine life. The total acreage involved, assuming all operations were conducted at the same time, is expected not to exceed 1,000. Best management practices mitigation would be used to minimize the impacts of development.

Potential for mineral material disposals in the area is low because of the lack of suitable deposits. Impacts would not be significant.

Impacts to horses from coal and other leaseable minerals would be negligible.

Short-term indirect impacts from motorized vehicle use would result from vegetation loss as a result of game retrieval and travel to campsites. The amount of vegetation loss attributed to OHV use is currently negligible and would not increase in an appreciable amount.

The recreational opportunities provided by historic trails and the Continental Divide National Scenic Trail SRMA would encourage recreational use. Such use would cause temporary displacement of wild horses from some preferred foraging areas. Such impacts would be short term and minimal as a result of the limited use these trails receive.

The management of the Historic Trails SD/MA and Adobe Town WSA within the RMPPA would result in localized, minimal impact on HMAs. Two trails—the Rawlins to Fort Washakie historic trail and the Continental Divide National Scenic Trail—transect the Stewart Creek HMA. Two other SD/MAs—the Cherokee historic trail and the Adobe Town WSA—coincide with portions of the Adobe Town HMA. Potential impacts to wild horses resulting from the management of these SD/MAs would be negligible and restricted to the SD/MA and to areas directly adjacent to the historic trails. Restrictions on

development in the SD/MAs preclude, restrict, or require mitigation for surface disturbing activities which would protect vegetation within these areas.

Transportation and access management would have impacts similar to lands and realty and minerals development.

Treatment of noxious and invasive weeds (2,800 acres and year) would reduce competition with native vegetation, which would provide increased forage for wild horses in treated areas. However, weed infestations that are left untreated would continue to reduce available forage for wild horses.

Impacts to wild horses from VRM would be minimal. Available forage for wild horses would not be impacted by development and associated surface disturbance within the Adobe Town WSA because the VRM Class I designation for the Adobe Town WSA precludes development (the Adobe Town WSA represents only a minor portion of the Adobe Town HMA). The VRM class in the remainder of the Adobe Town HMA and in the Stewart Creek and Lost Creek HMAs is primarily VRM Class III. VRM Class III would not preclude surface disturbing activities or preclude facility placement, but would influence the location and design of the facility, which would result in vegetation loss and displacement of horses.

Under this alternative, the Lost Creek AML would remain at 70 horses. Genetic viability of wild horses in all HMAs would be maintained; however, the maintenance of the New World Iberian genotype associated with horses in the Lost Creek HMA would not be guaranteed.

Impacts to wild horses from water quality, watershed, and soils management actions, such as avoiding disturbance near water and soil resources, and headcut and stream restoration projects aimed at reducing erosion in watersheds and improving water quality, would provide a long-term benefit to wild horses by enhancing habitat and increasing forage production and would contribute to the attainment of Standards for Healthy Rangelands.

Seasonal wildlife stipulations and avoidance areas (Table 2-10) would preclude, restrict, or require intensive management or mitigation for surface disturbing activities. This would maintain available forage and reduce human disturbance during critical time periods where protected habitats coincide with existing HMAs.

Summary

Wild horses would be temporarily displaced from preferred locations by human presence and activities, such as oil and gas development or dispersed recreation in HMAs. Where bison are approved within an HMA, wild horse behavior and use of water and vegetation resources would be altered.

Habitat components, such as forage and water, would be impacted by various actions. Range improvements, such as stock ponds and vegetative treatments, would cause long-term increases in the availability of water and the productivity of the range. Wildland fire, vegetation treatments, and ROW development would temporarily reduce forage conditions, increasing localized competition between livestock, wild horses, and wildlife. Long-term forage conditions would be stable to increasing in quality and quantity.

The wild, free-roaming nature of the horses would decrease in areas of moderate and high oil and gas activity.

Genetic viability of wild horses in all HMAs would be maintained; however, the maintenance of the New World Iberian genotype associated with horses in the Lost Creek HMA would not be guaranteed.

4.18.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality management, SD/MAs other than Historic Trails SD/MA, Continental Divide Scenic Trail SRMA, and Adobe Town WSA would have little or no impacts on wild horses.

Impacts from cultural resource management; forest management; lands and realty; OHV management; the Historic Trails SD/MA; Continental Divide Scenic Trail SRMA; Adobe Town WSA; transportation and access management; water quality, watershed, and soils management; and wildlife management would be the same as those identified in Alternative 1.

In addition to impacts from fire and fuels management that are common to all alternatives, additional fire suppression efforts would possibly maintain existing forage in HMAs that would otherwise burn in wildland fires.

Livestock grazing management would have similar impacts to wild horses as under Alternative 1, except more water development actions would occur, which would increase the availability of water for wild horses.

Impacts from recreation management would be similar to Alternative 1; however, increased oil and gas development would reduce the wild and free-roaming nature of the horses and associated recreational opportunities.

Treatment of noxious and invasive weeds would be similar to Alternative 1, except that more acreage (25,786 acres/year) would be treated, which would provide increased forage for wild horses in treated areas. Poisonous plants would be identified for treatment in this alternative. Controlling poisonous plants would reduce potential death losses in wild horses and livestock, especially sheep. However, weed infestations that are left untreated would continue to reduce available forage for wild horses, but would be less likely than under Alternative 1.

Impacts to wild horses from VRM would be similar to Alternative 1.

Genetic viability of wild horses in all HMAs would be maintained; however, the maintenance of the New World Iberian genotype associated with horses in the Lost Creek HMA would not be guaranteed.

Impacts to wild horses from minerals management would be the same as under Alternative 1, except there would be fewer stipulations from other resource uses, such as cultural resources, Special Status Species habitat, big-game winter range, and raptor concentration areas, to reduce the impact of oil and gas development. As such, the pace at which oil and gas wells are developed might increase, leading to greater disturbance/removal of vegetation and associated weed infestations. In addition, as human activity increases, loss of the wild and free-roaming nature of the horses is significant.

Summary

Increased mineral development and a reduction in SD/MAs would increase the short-term displacement of wild horses and decrease available forage, leading to a greater loss in the wild and free-roaming nature of wild horses than any other alternative.

As under Alternative 1, genetic viability of wild horses in all HMAs would be maintained; however, the maintenance of the New World Iberian genotype associated with horses in the Lost Creek HMA would not be guaranteed.

4.18.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality management, SD/MAs other than Historic Trails SD/MA, Continental Divide Scenic Trail SRMA, and Adobe Town WSA would have little or no impacts on wild horses.

Impacts from cultural resource management; forest management; lands and realty; recreation management; the Historic Trails SD/MA; Continental Divide Scenic Trail SRMA; Adobe Town WSA; transportation and access management; and water quality, watershed, and soils management would be similar to Alternative 1. Impacts from treatment of noxious and invasive weeds would be similar to Alternative 2.

Impacts from fire and fuels management would be similar to common to all alternatives, except wildland fire for resource benefit would be emphasized to improve forage condition in HMAs when they occur. As a result, more vegetation would be burned during the life of the plan, thereby increasing the likelihood of maintaining vegetation in an early seral stage and improving the condition of the forage. Where wildland fire for resource benefit occurs, short-term impacts would be loss of vegetation and localized increased competition for forage, and long-term impacts would result in possible concentration on burned areas and associated delays in vegetation community responses.

The ability to reduce competition between wild horses and livestock for water and forage would be more limited because new reservoirs and pipelines would not be constructed. In addition, horses would not be influenced by bison behavior around riparian habitat and other water sources because of the solid block nature of the HMAs.

Impacts to wild horses from oil and gas development would be negligible. The operating practices and mitigating measures required for oil and gas development will render most impacts negligible in the long term, and the slight increase in human presence will not add to the erosion of the wild and free-roaming nature of the horses.

Impacts to horses from coal, other leaseable, locatable, and Common variety minerals would be negligible.

Impacts resulting from OHV management would be the same as those in Alternative 1, except in the Adobe Town WSA, which would be closed to OHV use, thereby resulting in no impacts on wild horses within the WSA. In addition, limiting OHV use to designated roads and vehicle routes, even for game retrieval or campsite access, would reduce long-term vegetation loss.

Impacts from recreation management would be similar to Alternative 1; however, increased horses in the Lost Creek HMA would enhance viewing opportunities of the New World Iberian genotype.

Vegetation management for DPC within an HMA would provide improved forage to support the wild horse population. Vegetation management would be similar to Alternative 2, except there would be an increase of 2,756 acres of treatment for both noxious and invasive weeds. Poisonous plants would not be identified for treatment and may result in potential death loss of wild horses as well as livestock, especially sheep.

Impacts to wild horses from VRM would be similar to Alternative 1, except 8,560 fewer acres would be designated as VRM Class II. The VRM Class II designation, in some cases, could preclude surface disturbing activities or preclude facility placement, which would result in loss of forage available to wild horses. However, in most cases, the VRM Class II designation would only influence the location and design of the facility, which would not prevent loss of forage available to wild horses.

Under this alternative, the population in the Lost Creek HMA would be allowed to increase because the AML would be increased to 165. If wild horse populations are maintained at a level greater than 100 competent breeding adult animals, there should be little (genetic) concern in the short term (USDI, BLM 2001b). Ensuring the viability of horses within the Lost Creek HMA would also preserve the rare and genetically valuable New World Iberian genotype and associated phenotype.

Wildlife and fisheries management actions would be similar to Alternative 1; however, additional measures for wildlife protection would be implemented under this alternative. Raptor protection measures with a 1.5-mile buffer are extended from February 1 to September 15 and are species-dependent; the raptor NSO to protect nests extends to 1/4-mile buffer protection. RCAs would be closed to oil and gas leasing, and activities on existing leases would be intensively managed. Surface disturbing and disruptive activities in sensitive species habitat, as well as migration and transitional ranges, would be managed and would decrease disturbance during sensitive time periods, such as foaling. The implementation of BMPs, management of water facilities, and extended greater sage-grouse breeding and nesting habitat protection decrease and/or remove negative impacts to horses. Where animal damage control activities are not allowed in domestic sheep allotments, it would potentially lead to lower levels of sheep use and reduced competition for forage between wild horses and livestock in HMAs.

Summary

Increased restrictions on surface disturbing activities would reduce human activity, thereby preserving the wild and free-roaming nature of wild horses. Increased restrictions from wildlife and vegetation management would decrease activities that result in short-term reductions in forage while providing for activities that result in long-term forage increases. Where animal damage control activities are not allowed in domestic sheep allotments, it would potentially lead to lower levels of sheep use and reduced competition for forage between wild horses and livestock in HMAs.

Similar to Alternative 1, range improvements, such as stock ponds and vegetative treatments, would cause long-term impacts by increasing the availability of water and forage.

The viability of horses within the Lost Creek HMA would be ensured. Ensuring the viability of these horses would also preserve the rare, and genetically valuable, New World Iberian genotype and associated phenotype.

4.18.5 Impacts Under Alternative 4: Proposed Plan

Air quality management, SD/MAs other than the Historic Trails SD/MA, Continental Divide Scenic Trail SRMA, and Adobe Town WSA would have little or no impacts on wild horses.

Impacts from cultural resources management; lands and realty; forest management; oil and gas development; the Historic Trails SD/MA; Continental Divide Scenic Trail SRMA; Adobe Town WSA; transportation and access management; water quality, watershed, and soils management; and wildlife management on wild horses would be the same as those identified in Alternative 1.

Fire and fuels management impacts would be similar to Alternative 3 because the wild horse HMAs are located in areas where the use of wildland fire for resource benefit is more likely to occur.

Impacts to horses from livestock grazing management would be similar to Alternative 1, except horses would not be influenced by bison behavior around riparian habitat and other water sources because of the solid block nature of the HMAs.

Impacts to horses from coal and other leaseable, locatable, and Common variety minerals would be negligible.

Impacts from recreation management would be similar to Alternative 3.

Impacts resulting from OHV management would be the same to those under Alternative 1, except vegetation loss related to game retrieval and campsite access would be reduced to just 300 feet from designated roads and vehicle routes.

Vegetation management for DPC within an HMA would provide improved forage to support the wild horse population. Vegetation management would be similar to Alternative 1, except there would be an increase of 22,223 acres of treatment for both noxious and invasive weeds.

Genetic viability of wild horses in all HMAs would be maintained, specifically by implementing management practices to preserve the New World Iberian genotype associated with horses in the Lost Creek HMA.

Impacts to wild horses from VRM would be similar to Alternative 1, except 8,560 fewer acres would be designated as VRM Class II. However in most cases, the VRM Class II designation would only influence the location and design of the facility, which would not prevent loss of forage available to wild horses.

Summary

Impacts under this alternative are similar to Alternative 1. Wild horses would be temporarily displaced from preferred locations by human presence and activities such as oil and gas development or dispersed recreation in HMAs.

Habitat components, such as forage and water, would be impacted by various actions. Range improvements, such as stock ponds and vegetative treatments, would cause long-term impacts by increasing the availability of water and forage. Wildland fire, vegetation treatments, and ROW development would temporarily reduce forage conditions. Long-term forage conditions would be stable to increasing in quality and quantity.

The wild, free-roaming nature of the horses would decrease in areas of moderate and high oil and gas activity.

The genetic viability of wild horses in all HMAs would be maintained.

4.19 WILDLIFE AND FISH

This section presents potential impacts to wildlife and fish from other management actions. Existing conditions concerning wildlife and fish are described in Section 3.19.

Significance Criteria

Impacts to wildlife and fish would be considered significant if any of the following were to occur:

- Substantial loss of the biological integrity and habitat function of terrestrial and aquatic ecosystems that would make a species eligible for listing under the ESA
- Decreased viability or increased mortality of T&E, proposed, and/or candidate species, or adverse alteration of their Critical habitats
- Management actions that result in substantial disruption or irreplaceable loss of vital and high-value habitats as defined in the Wyoming Game and Fish Department Mitigation Policy
- Substantial loss of habitat function or disruption of life history requirements of Special Status Species that would preclude improvement of their status.

Methods of Analysis

Impact analyses and conclusions are based on interdisciplinary team knowledge of resources and the RMPPA, review of existing literature, and professional judgment of experts within BLM and other agencies. Effects are quantified where possible. In the absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

The analysis is based on the following assumptions:

- BLM would continue to manage fish and wildlife habitats in coordination with the WGFD.
- In cooperation with WGFD, BLM would continue to manage species listed on BLM Wyoming State Director's Sensitive Species List in accordance with BLM manual 6840.
- USFWS would have jurisdiction over the management of T&E fish and wildlife populations.
- The health of fisheries within the RMPPA is directly related to the overall health and functional capabilities of riparian and wetland 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 or indirectly affect the aquatic environment. 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. As riparian systems adjust in response to the removal of vegetation or changes in hydrologic conditions, the availability of habitats required to fulfill the life history requirements of fish populations might be affected.
- RFDs and RFAs can be found in Appendix 33.

4.19.1 Impacts Common to All Alternatives

Air quality, paleontology, socioeconomic, and visual resource management would have little or no impact to wildlife and fish resources.

Human disturbance of big game, whether it is intentional (e.g., harassment) or unintentional (i.e., accidental), results in increased energy costs to the alerted animal (Bromley 1985). The disturbed big game animal incurs a physiological cost either through excitement (preparation for exertion) or locomotion. A fleeing or displaced animal incurs additional costs through loss of food intake and potential displacement to poorer (lower) quality habitat. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978).

BLM defines "flight distance" (or displacement distance) as that to which a person can approach a wild animal without causing it to flee. Factors that influence displacement distance in big game include—

- Inherent species-specific characteristics
- The seasonally changing threshold of sensitivity as a result of reproductive and nutritional status
- The type of habitat (e.g., longer disturbance distances in open habitats)
- The specific experience of the individual or group (e.g., extent and type of exposure to humans/habituation)
- Weather (adverse weather [wind, fog, etc.] may decrease the disturbance)
- Time of day (e.g., animals generally are more tolerant during dawn and dusk periods)
- The social structure of the animals of interest (a group of individuals is generally more tolerant than solitary individuals).

Several studies have been conducted over the past 25 years in an effort to determine the extent to which human activities influence big game. Many of these studies focus on the potential impacts to big game from oil and gas exploration and production, surface mining, road development, and recreation. In some cases, researchers attempted to determine the distance at which these activities resulted in disturbance to big game. This information was compiled and used to estimate an average distance at which all or a majority of the animals of a particular species would remain undisturbed during well construction and road use (Table 4-5). This average distance does not represent an absolute or definitive value, but rather a measure of the anticipated displacement of big game from areas adjacent to such activities. In some cases, topographic or habitat features may provide protection from the visual disturbance and noise associated with these activities, and allow animals to remain undisturbed within the average displacement distance.

Table 4-5. Potential Displacement for Big Game Species

Big Game Species	Type of Disturbance	Potential Displacement Distance (miles)	Supporting Literature
Pronghorn	Well construction/workovers	0.5	Gusey (1986); Easterly et al. (1991)
	Road traffic/operations and maintenance	0.25	Bruns (1977); Autenrieth (1983); Reeve (1984); Yeo et al. (1984)

Big Game Species	Type of Disturbance	Potential Displacement Distance (miles)	Supporting Literature
Mule Deer	Well construction/workovers	1.0	Hiatt and Baker (1981); Gusey (1986)
	Road traffic/operations and maintenance	0.75	Perry and Overly (1976); Freddy (1986); Freddy et al. (1986); O'Neil and Witmer (1991)
Elk	Well construction/workovers	1.5	Hiatt and Baker (1981); Gusey (1986); Brekke (1988)
	Road traffic/operations and maintenance	1.0	Ward (19973, 1976); Ward et al. (1973); Perry and Overly (1976); Rost and Bailey (1979); Ryder et al. (1986); O'Neil and Witmer (1991)

Mule deer are generally less sensitive to human disturbance than elk and, in some cases, may be less sensitive than pronghorn. The concept of the level of impact varying by season was not considered because summer habitat is not a limiting factor, whereas crucial winter habitat is limited; therefore, disturbance would most likely not be an issue to these species except for the limitation on crucial winter habitat. Within the RMPPA, only 35 percent of identified big game crucial winter range is located on BLM-administered public lands. Increased development and road creation in crucial winter range compound impacts to big game species by increasing public access to the winter range for road maintenance, condensate removal, pumpers (meter readers), recreation, potential poaching, and other factors.

Cultural Resource Management

The potential exists for proposed projects to be relocated to reduce impacts to cultural resource or Native American sacred or sensitive sites. The level of impact to wildlife is dependent on the quality of the habitat where the cultural resource is located. Excavation of cultural sites and cultural inventories would have only local and short-term impacts on wildlife and their habitats, given the limited footprint of such actions on the landscape.

Fire and Fuels Management

Wildland fire would be beneficial or detrimental to wildlife and their habitats. The conversion of some late-seral stage stands to early and mid-seral would provide diversity in habitat, forage, and cover. This conversion would potentially have a negative affect to species adapted to late-seral forest types. Periodic random wildland fires would rejuvenate over-mature, decadent shrub communities and would remove vegetation, forage, hiding cover, and thermal cover.

In the short term, any fire would cause the loss of less mobile wildlife that might not be able to avoid the fire's path. However, many species would normally recolonize burned areas fairly quickly. Wildland fires that occur in areas of important amphibian populations would have a detrimental impact to local populations. Debris flows, increased siltation, and loss of riparian/wetland vegetation as a result of wildland fires would impact amphibian populations by temporarily altering the suitability of aquatic habitats. For fragmented amphibian populations that lack sufficient recolonization potential, these impacts might be significant at the population scale. For amphibian populations that do not exhibit fragmentation, rapid vegetative responses following wildland fire would allow habitats to be recolonized from neighboring populations. Additions of carbon to aquatic systems resulting from wildland fires can alter water quality characteristics and affect fish populations and their habitats. However, given sufficient

recolonization routes and vegetative succession, aquatic populations can benefit from increased inputs of carbon that can result from fires. Roads or other surface disturbance associated with fire suppression activities might increase sedimentation rates into riparian/wetland habitats. Water used for fire suppression would potentially contain parasites and other diseases (e.g., whirling disease) or result in the transfer of unwanted aquatic biota.

Forest Management

Non-commercial harvest of minor wood products, such as poles, firewood, and wildings, would have a minimal effect on wildlife resources. These impacts would include short-term disturbance of wildlife during wood product harvest, minor modification or loss of habitat resulting from the removal of wood products, and other general disruptions caused by temporary human presence. Manipulation of aspen, juniper, and other non-commercial tree species to meet forest health and other multiple use objectives would have variable affects on wildlife species. These impacts would include short-term disturbance of wildlife, minor modification or loss of habitat due to removal of trees, and other general disruptions caused by temporary human presence. Those species that require late seral stages would lose habitat and would be displaced. Those species that require early to mid-seral stage habitat requirements would have increased ranges.

Lands and Realty Management

Habitat loss, degradation, fragmentation, and species displacement from linear features (e.g., power lines, roads, and pipelines) and other permitted facilities (e.g., communication sites and wind turbines) would occur. ROW-approved actions for power lines, communication sites, and wind turbines would increase the potential of injury and death to bats, raptors, and other migratory birds as a result of collisions. Appropriate mitigation measures, such as adjusting the location, height, spacing, coloration, and density of development, would avoid or reduce disturbance to migration routes, wintering areas, and other sensitive habitats. Increased road density and human presence would act to increase stress levels of wildlife during sensitive time periods (e.g., breeding, migration, and wintering) and thereby increase habitat fragmentation. Continual noise emissions would affect breeding rituals (i.e., vocalizations), thereby reducing the mating success of birds. This would reduce the reproductive success of greater sage-grouse by interfering with the ability of female sage-grouse to locate leks. An increased amount of edge habitat from disturbance would increase the variety of forage species, adjacent habitat height components, and the associated animal species.

The crossing of riparian areas by roads, for a ROW action, would fragment fish populations by limiting the movement of aquatic species. Incorporation of fish passage needs would minimize this impact. Roads would concentrate stream flow, increase erosion rates, and create new stream channels. The creation of new stream channels increases the probability of large head cuts and sedimentation, which reduces the amount of viable habitat for reproduction.

Land acquisition or disposal actions would be consistent with Appendix 6, Land Exchange, Acquisition, and Disposal Criteria. Implicit in the criteria is the goal that the exchange, acquisition, or disposal would increase the value of the public land resources, including wildlife resources. There are some inherent potential benefits to wildlife habitats associated with these actions. Any acquisition of nonfederal surface land that includes high-value habitat would allow for mitigation of surface disturbing and disruptive activities to maintain or enhance the habitat for the associated wildlife that would not occur on land under nonfederal ownership. Any disposal of surface land that contains high-value habitat would increase the potential for development without any required mitigation, and increased human presence would increase disturbance to wildlife utilizing the area.

Returning the Seminoe Reservoir and Savery-Pothook withdrawn lands to BLM management responsibility creates an opportunity for more consistent management across these lands, which would allow increased consideration of wildlife values in management decisions.

Livestock Grazing Management

Livestock grazing would result in direct competition for forage, water, and space, as well as indirect effects upon fish and wildlife populations or their habitat. There is also disturbance or displacement that results from the construction and maintenance of range improvements. The development of livestock grazing systems, including range improvements, would provide the opportunity for improvement or maintenance of range conditions that support a diversity of wildlife and fish. Management of BLM lands to meet Standards for Healthy Rangelands (USDI, BLM 1997) would result in actions that would balance the effects of grazing while sustaining viable fish and wildlife species and their habitat. In addition, this would result in the improvement or maintenance of habitats sufficient for listed species to recover and be delisted, as well as avoid or prevent additional species becoming listed. The use or implementation of grazing BMPs (Appendix 19) would help to maintain or restore habitat conditions for various fish and wildlife. Areas that are fenced to exclude livestock grazing, such as springs and seeps, recreation sites, management studies, and sensitive plant locations, would provide areas of ungrazed vegetation that improves nesting, feeding, and hiding cover for wildlife that utilize these areas.

Livestock grazing practices affect specific fish and wildlife species in many ways. Cattle diets overlap to a high degree with those of elk and bighorn sheep, and domestic sheep diets have a high overlap with antelope and mule deer diets, creating competition for forage among livestock and big game species on a year-round basis. In cases where cattle are removed during winter months from elk crucial winter range, it eliminates most of the competition for space between these two species during this critical time period. Competition for space between cattle and bighorn sheep is considerably less because of the steeper and rougher topography that sheep inhabit. Winter use by domestic sheep does not currently overlap, and therefore does not compete with mule deer and antelope on their respective crucial winter ranges. On the other hand, summer/fall cattle use of grasses balances wildlife use in antelope and mule deer crucial winter range, which appears to maintain a more healthy and diverse mixture of grasses and shrubs in these habitats. Livestock mortality would benefit wildlife predators, and would potentially reduce predation on other wildlife species. Implementation of BLM policy and recommendations from the Wyoming Bighorn/Domestic Sheep Interaction Working Group would reduce disease transmission from sheep and goats to bighorn sheep. Wild populations of bighorn sheep are not resistant to several diseases that are commonly carried by domestic sheep and goats. Ensuring and maintaining appropriate distances between domestic and wild populations would greatly reduce the potential for disease transmission (Map 2-3) and promote viable herds of bighorn sheep.

Indirect effects from livestock on fish and wildlife are often just as important as direct effects. Removal of vegetation by livestock reduces vertical structure of vegetation, particularly grasses, which reduce the visual security for upland nesting birds. This would potentially lead to increased predation and lower nesting success. Overuse of desired forage species by livestock results in a change in species composition, which generally negatively affects wildlife. For example, suppression or loss of shrubs and trees in riparian plant communities limits the use of these habitats by neotropical birds. Conversely, livestock grazing in saltbush steppe, grass-dominated habitats would benefit or have little effect on species such as the mountain plover or white-tailed prairie dogs. Appropriate levels of livestock forage use would potentially benefit wildlife habitat, T&E, candidate, and proposed sensitive plant populations. Appropriate use levels and timing of grazing would improve the palatability of forage for elk. Ute ladies'-tresses respond favorably to light or moderate grazing intensity in riparian areas. Cattle use of sedges and grasses increases the proportion of succulent forbs found in the plant community, but also has the potential to reduce the stability of riparian systems with inappropriate season or duration of use.

The impacts of past livestock grazing management on stream processes and fish habitats have been well documented (Armour 1991; White 1996; Rinne 1999). These impacts include the loss of stabilizing riparian vegetation and habitat, which leads to stream instability, the loss of shading vegetation. This leads to elevated stream temperatures, increased sediment delivery, and the loss of natural stream channel morphology. Livestock tend to congregate near water sources, potentially compromising stream bank stability and causing increased erosion. In locations where these effects are identified, changes in livestock management actions would occur to improve riparian habitat for fish and other wildlife populations.

Range improvements, such as fencing and water developments, are designed to assist in the management of livestock grazing distribution and use patterns, which affect fish and wildlife in numerous ways. Existing fences, particularly those which do not conform to current BLM standards for fence construction, create travel barriers, alter distribution patterns, increase stress and energy loss, and cause injury or death from entanglement. The construction of new fences to BLM standards would still contribute these same effects to wildlife, but to a lesser degree. Fences create obstructions that birds fly into and perches for avian predators. The indirect benefit of fences is the control of appropriate levels and duration of livestock grazing which improves health, vigor, cover, and production of vegetation important to wildlife.

In the immediate vicinity of any new water developments, livestock use would intensify, which would remove available forage and modify habitat. Water developments would also provide the opportunity to defer or rest certain habitats from livestock grazing to improve vegetative values that would benefit fish and wildlife species. Development of offsite water sources would allow streams and/or lake water sources to be fenced out and managed for fish and wildlife habitat. Wells developed in locations lacking dependable water sources would benefit wildlife species by expanding the range of wildlife into areas that were only seasonally utilized, lowering population density around traditional water sources, and potentially reducing mortality caused by predation and disease. Development of springs and seeps eliminates livestock excrement, urine, and trampling from these sites, which improves the water quality and potentially increases water quantity available for fish and wildlife. This also provides the opportunity for desirable forage plant species to grow and expand, increasing the composition, cover, and vertical structure of vegetation that supports greater numbers and diversity of fish and wildlife populations.

Minerals Management

Oil and gas development would reduce usable habitat and disrupt wildlife movement. Habitat fragmentation occurs when a contiguous habitat is altered by surface disturbing activities. This would cause a reduction in usable ranges from avoidance of disturbance; the isolation of smaller, less mobile species; a loss of genetic diversity 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). Management actions to minimize disturbances to wildlife during sensitive life cycles can be found in Table 2-10 (Seasonal Wildlife Stipulations for All Surface Disturbing Activities).

There are approximately 112,460 (19 percent) acres of elk crucial winter range; 235,019 (21 percent) acres of mule deer crucial winter range; and 285,980 (20 percent) acres of pronghorn crucial winter range that would be directly impacted by areas that are identified for oil and gas and CBNG development (Map 4-7). The disturbed big game animal incurs a physiological cost either through excitement (preparation for exertion) or locomotion. A fleeing or displaced animal incurs additional costs through loss of food intake and potential displacement. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978). Operational activity from oil and gas development (including habitat disturbance from existing/new roads and pipeline corridors), mining, and Common variety minerals extraction occurring during the winter on crucial winter range all contribute, to varying degrees, impacts to wildlife when they are most vulnerable.

In addition, indirect disturbance would occur to crucial winter ranges that are contiguous with those ranges that are directly impacted, but occur outside of areas currently identified for oil and gas and CBNG development. Therefore, 85,664 (14 percent) acres of elk crucial winter range; 259,785 (23 percent) acres of mule deer crucial winter range; and 737,783 (43 percent) acres of pronghorn crucial winter range would be indirectly impacted. Displacement would result in animals being displaced to poorer (lower) quality habitat or habitat that is currently at carrying capacity. This would reduce individual animal health, and/or decrease total population numbers through increased mortality.

The total percentage of crucial winter range that would be directly and indirectly impacted by oil and gas and CBNG development include approximately 33 percent of the available elk crucial winter range, 44% of the available mule deer crucial winter range and 63 percent of the available pronghorn crucial winter range. The degree to which development would affect big game herd varies by location and percentage of affected crucial winter range for the given herd unit. In instances where a majority of the crucial winter range would be affected for a given herd unit, there would be more of a potential impact in the associated big game herd.

There are 142 out of 491 sage-grouse leks (29 percent) within high or moderate oil and gas potential. Another 30 leks are within 2 miles of high or moderate oil and gas potential. Therefore, 35 percent of the currently identified sage-grouse nesting habitat within the RFO would be potentially affected by oil and gas development. There are also 8 of 22 sharp-tailed grouse leks (36 percent) and their nesting habitat that are within high or moderate oil and gas potential. Potential impacts of mineral development on greater sage-grouse populations include direct habitat loss from well, road, pipeline, and transmission line construction; increased human activity and associated pump noise causing displacement; increased harvest resulting from improved access and activity; and direct mortality associated with evaporation ponds and increased exposure to predation (Braun 1986, TRC Mariah Associates Inc. 1997). Studies conducted on greater sage-grouse indicate that noise might be adversely affecting strutting and nesting grouse (Map 2-57) (Dantzker et al. 1999). Mating displays by male sage-grouse involve acoustic signals coupled with visual displays (Eng et al. 1979; Vehrencamp and Bradbury 1989; Gibson and Bradbury 1985; Bigson 1989, 1992, 1996; Gratson 1993) so that constant noise would interfere with females' attraction to males' displays. Increased noise resulting from oil- and gas-related traffic would possibly affect the ability of female grouse to locate leks, potentially reducing the reproductive viability of the species. Additional studies have also found that prevailing wind direction plays a major role when female grouse attempt to locate leks. Based on recent studies near Pinedale, Wyoming, attendance on leks situated generally east of operating drilling rigs (i.e., drilling rig-to-lek directions northeast and southeast) declined significantly relative to control leks, whereas when drilling rig-to-lek directions were generally west, male lek attendance changes did not statistically differ from controls (Holloran 2005).

Initially, an estimated 7.1 acres of wildlife habitat would be lost for each new oil and gas well. After the well becomes operational, the disturbance drops to on average 4.5 acres per well. Reclaimed areas would be more vulnerable to invasion of noxious weeds and would not provide the same habitat, forage, or cover value that the original area provided. In addition, reclamation of surface disturbances must be viewed from the perspective of vegetative succession. Sites are often initially stabilized with early successional species, but given sufficient time, these species would be replaced by late successional species such as sagebrush. Mitigation measures that reduce surface disturbance such as drilling of multiple well bores from a single well pad would reduce the number of surface locations and, therefore, retain larger blocks of unfragmented, undisturbed habitat. Wells that are no longer producing would be reclaimed, and potentially return those disturbed lands to productive wildlife habitat.

The crossing of riparian areas by roads can act to fragment populations of aquatic species by limiting movement among required habitats. Habitat fragmentation has been shown to interfere with the metapopulation dynamics of many fish populations. When extirpations occur as a result of localized

environmental variation, restrictions of fish passage eliminate the possibility of the area being recolonized from a neighboring population. Review of road design criteria and incorporation of fish passage needs would minimize this impact (Appendix 26). Additional impacts of roads would include alteration of local hydrologic conditions resulting from additional flow paths. This alteration would possibly affect the suitability of habitats for aquatic species by increasing sediment delivery to streams. In addition, road stream crossings (e.g., culverts) have the potential to eliminate upstream movements of some aquatic macroinvertebrates (Vaughan 2002).

Surface disturbing and other disruptive activities associated with well pad construction would increase sediment delivery to stream and standing water systems, which might interfere with the life history strategies of fish. For example, clean gravels are required by many fish species for successful spawning. Increased sediment delivery can embed these gravels and render spawning efforts unsuccessful or lower embryo survival (Magee et al. 1996).

Water drawn from surface sources for dust abatement and surface disturbing activities would decrease the usable riparian wetland habitat available to fish and wildlife populations.

The impacts of geophysical activity on wildlife would include temporary displacement of various wildlife species, direct mortality of small animals and birds, collapsed burrows and crushed nests, and a minimal amount of habitat disturbance from overland travel of seismic vehicles. With proper application of BMPs and/or mitigation, these associated impacts would be temporary and minor.

The impacts resulting from coal mining activities would only include the reclamation of the currently disturbed lands in the Hanna Basin area. Short-term impacts would include displacement of wildlife as a result of human activities and heavy equipment operations. Reclamation of these areas would decrease the amount of time it takes for an area to return to predisturbance habitat characteristics.

Areas closed to locatable mineral entry would serve to protect habitat from disturbance associated with locatable mineral exploration. In areas closed to locatable mineral entry, other types of developments would potentially be allowed to occur, resulting in degradation of wildlife habitat, displacement, and/or increased wildlife mortality. Withdrawals are limited because of the small amount of potential for locatable mineral exploration that is anticipated.

Common variety mineral material extraction would result in short-term and direct removal of vegetation, increased dust, displacement of wildlife, stress associated with human presence, and noise. However, impacts to wildlife and associated habitat would be minimal because disturbances are generally small, localized, and temporary, and because common variety mineral material extraction activities are discretionary, and would not be approved in high-quality habitats.

OHV Management

Reclamation of unnecessary or undesirable vehicle routes would reduce habitat fragmentation and physiological stress caused by vehicle-related activities.

Over-the-snow vehicles would affect wintering wildlife by increasing displacement and stress during critical time periods. Several closures and seasonal restrictions exist to minimize this impact (see SD/MA section below).

In general, OHV management activities that result in increased human presence would have a moderate localized impact on wildlife and fish species. Impacts would include increased displacement of wildlife, increased stress during critical time periods, and degradation of habitats. A fleeing or displaced animal

incurs additional energy costs through loss of food intake and potential displacement to lower quality habitat. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978). OHV use can alter the seasonal use patterns of many wildlife species. Of particular concern are raptor and greater sage-grouse nesting sites, sage-grouse leks and brood rearing areas, big game parturition areas, and all winter habitats. Management actions restricting OHV use in areas limited to designated roads and vehicle routes would decrease these impacts to wildlife and their habitat. Offroad vehicle travel for "necessary tasks" associated with authorized activities would cause minor short term surface disturbance and disruption of wildlife activities similar to those mentioned above. There would be additional habitat disturbed because otherwise intact habitat would be crushed, soil would be compacted, and localized erosion would be increased where the vehicle traversed the land.

Offroad vehicle traffic would be limited in areas where there are seasonal restrictions and time of day restrictions, which would help to reduce the potential impacts. Seasonal vehicle closure (including over-the-snow vehicles) of Encampment River Canyon would reduce stress to the big game that inhabit the area during the winter. Other temporary, seasonal, or permanent closures to motorized vehicle use of any kind would also reduce stress and displacement to wildlife as needed. The overall goal of road closures would be to allow the animals to exist undisturbed during the winter months and thereby increase the condition and over-winter survivability of the animals.

Paleontological Resource Management

Authorized collection of vertebrate fossils would have only local and short-term impacts on wildlife and their habitats. The short- and long-term impacts associated with these actions would not be detrimental to wildlife and their associated habitat, given the limited footprint of such actions on the landscape. The level of impact is dependent upon the quality of the habitat where the paleontological resource is located.

Management actions for paleontological resources likely would provide various degrees of wildlife and fish protection through habitat preservation that minimizes vegetation loss and erosion by restricting surface disturbing and other disruptive activities. Wildlife disturbances would occur if the public interpretation facilities generate increased human presence during sensitive seasonal periods (e.g., breeding, nesting, or migration); it is not likely that significant human presence would occur during the winter period. It is expected that adverse impacts associated with paleontological management would be limited to relatively small areas.

Recreation Resource Management

Maintenance or improvement of existing sites or development of new recreation sites would cause minor displacement of wildlife, and increased physiological stress to animals in the immediate area of the recreation site. There would also be small amounts of habitat disturbed in association with maintenance and development activities, which would reduce the availability of that habitat. Furthermore, the general avoidance of human activities by most animal species would reduce the use of the adjacent areas by these animals. This impact would be minor because of the small acreage associated with developed recreation sites.

Disbursed recreation activities that result in increased human presence would have a moderate localized impact on wildlife and fish species. These activities include hiking, biking, camping, boat use, fishing, hunting, and sightseeing. Human presence and activity would result in both direct impacts to wildlife from hunting and vehicle collisions, as well as indirect impacts from wildlife displacement and physiological stress at any time of the year. The WGFD sets hunting seasons and harvest limits to adjust specific wildlife population levels. These seasons occur at a time when wildlife are at peak condition and this management is designed to reduce wildlife population pressures on habitat and forage. The

management actions the BLM places on wildlife habitat would reduce stress and harassment during critical or crucial time periods when the animals are least able to absorb or deal with the added stress caused by human interaction.

Human disturbance of wildlife, whether it is intentional (e.g., harassment) or unintentional, results in increased energy costs to the alerted animal (Bromley 1985). Disturbed wildlife incurs physiological costs either through excitement (preparation for exertion) or locomotion. A fleeing or displaced animal incurs additional costs through loss of food intake and potential displacement to lower quality habitat. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978).

Special Recreation Management Areas

Any recreational management activity designed to improve travel management and access to public lands provides additional recreation opportunities, experiences, activities, and destinations which would increase user density. Increased access and use would displace wildlife to less preferred habitats, possibly increase interspecific and intraspecific competition among animals, and increase physiological stress. Appropriate placement of facilities would minimize these impacts to wildlife.

Precluding surface disturbance within the Continental Divide National Scenic Trail SRMA would maintain wildlife habitat integrity within the SRMA. NSO restrictions would relocate surface disturbing activities to areas outside of the SRMA.

The reclamation of unnecessary or undesirable vehicle routes within the Shirley Mountain SRMA, Continental Divide National Scenic Trail, Pedro Mountain SRMA, North Platte River SRMA, Jelm Mountain SRMA, Laramie Plans Lakes SRMA, and Rawlins Fishing SRMA would reduce disturbance, and increase habitat for wildlife.

Special Designations/Management Areas

Wilderness Study Areas

Management of WSAs requires adherence to the “non-impairment” criteria according to the Interim Management Policy for Lands Under Wilderness Review, until Congress either designates each WSA as “wilderness” or releases it from consideration. WSAs would benefit wildlife and fish species and associated habitat by restricting surface disturbing and other disruptive activities to preserve wilderness characteristics.

Other Special Designations/Management Areas

Protections aimed at conserving vegetation, and limitations on surface disturbing and other disruptive activities, would benefit wildlife by enhancing overall habitat conditions. Temporary, seasonal, or permanent closures to motorized vehicle use of any kind would also reduce stress and displacement to wildlife as needed. The overall goal of road closures would be to reduce disturbance to wildlife during the winter months and thereby increase the condition and over-winter survivability of the animals. Furthermore, seasonal closures to human disturbance within crucial winter ranges, as well as in other sensitive habitats, would reduce disruption to wildlife during critical life cycle periods. Developments, uses, and facilities would be managed spatially to minimize loss or alteration of wildlife habitat of higher value. Withdrawals that preclude locatable mineral entry would serve to protect habitat from disturbance associated with locatable mineral exploration. The benefit of these withdrawals is limited because of the low potential for locatable mineral exploration that is anticipated. Intensive management of livestock grazing would be designed to meet the objectives of SD/MAs, improve vegetation health and vigor, and

result in maintained or improved wildlife habitat. Any closure or action that reduces surface disturbance to protect cultural resources would also serve to protect or maintain the associated wildlife habitat.

Implementation of management actions to reestablish the Colorado River cutthroat trout and other native fishes to portions of their historic range within the Muddy Creek watershed would restore habitat conditions and help to ensure the persistence of the native Colorado River Basin fish fauna. Improvement of habitat conditions resulting from implementation of these actions also would expand habitats that are suitable to coldwater fishes and, therefore, increase angling opportunities (see also upper Muddy Creek watershed area SD/MA). Avoidance of surface disturbance from the determination of coal unsuitability resulting from the status of the Colorado River cutthroat trout would preclude surface disturbance and erosion-related impacts to the species.

Transportation and Access Management

Transportation routes tend to fragment habitats and can act as barriers to some species, especially in severe winter conditions. Migration routes would 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.

Transportation routes would also increase public accessibility to areas that previously have been somewhat inaccessible to vehicles during times of the year critical to wildlife. As demand for use of public lands increases (recreation, resource development) and transportation systems are improved to accommodate that demand, adverse effects to wildlife would intensify. Impacts of human activity include the displacement of wildlife from seasonally preferred habitats and physiological stress resulting from human presence and activity. Proper placement of new roads and reduction of unnecessary roads would reduce impacts associated with increased human activity.

The impact of new roads on fish habitats can be divided into three categories: construction, presence, and urbanization (Angermeyer et al. 2004). These activities accelerate fine-sediment loading into stream channels. Though the biological effects of sedimentation include a variety of ecological interactions (Waters 1995), sedimentation can act to shift habitat structure such as channel depth, pool-to-riffle ratio, percent fines in substrates, and cover availability (Angermeyer et al. 2004). Additional impacts occur when water is diverted along the roadway and routed to surface-water drainage networks at drainage crossings. This would, in turn, alter the timing, routing, and magnitude of runoff, triggering geomorphic adjustments through erosion by channel incision, new gully or channel head formation, or slumping and debris flows. With proper siting and engineering of transportation routes, many of these impacts can be reduced or minimized.

Vegetation Management

Vegetation manipulation to improve wildlife habitat would include prescribed burns, livestock grazing strategies, and biological, chemical, and mechanical controls. These treatments provide diverse habitats for various species of wildlife. Vegetation management would be beneficial to wildlife and their habitats. Short-term impacts would include displacement of wildlife caused by project activity during implementation. In addition, some species that are dependent upon the current habitat conditions would be displaced until vegetation communities are reestablished.

Prescribed fires are usually conducted during the spring or fall. These fires are generally “cooler” than summer wildland fires. The short-term effect of these fires would be temporary loss of habitat function and displacement of wildlife. Prescribed fires would improve the diversity of vegetation age classes and lead to greater herbaceous vegetation production and forage quantity and quality, improving palatability

for some wildlife species. Conversely, the conversion to early seral vegetative communities would result in a reduction of habitat available to species, requiring expansive tracts of contiguous late-successional habitat.

Vegetative treatments in upland areas might occasionally increase water yields and affect fish habitats. These effects are likely to be highly variable depending on local hydrologic characteristics and fish life history requirements.

Treatments in upland areas often divert livestock and wildlife use away from riparian and wetland areas, thus increasing the vigor and structural diversity of these plant communities. This would lead to increased growth of woody and herbaceous riparian vegetation that, in turn, would increase channel stability, stream shading, and introduction of woody debris. This would improve habitat conditions for fishes. Additional impacts to aquatic species and their habitats resulting from large-scale prescribed fires would likely be similar to those described under Fire and Fuels Management above.

Incorporation of BMPs (Appendices 13, 14, 15, and 19) and other management actions (biological, chemical, mechanical, and fire treatments) to achieve standards for healthy rangelands would maintain or improve health, vigor, structure, and diversity of vegetation communities. Any improvement in vegetation communities would improve overall wildlife habitat condition. Effects to wildlife include improved condition, increased fecundity rates, and overall fitness.

Areas containing unique plant communities that would be closed to locatable mineral exploration and development and areas fenced to protect Special Status plant species would provide protection to wildlife habitats.

Control of noxious and invasive weed species would reduce competition with native species important to wildlife habitat and populations. Improved vigor, health, and forage production of plant species would maintain or improve forage production, cover, and vertical structure for wildlife. Increased forage availability and forage quality (nutrient content) would increase wildlife fitness and survival.

Application of weed control methods would cause short-term displacement of wildlife from treatment areas. In addition, there is the potential for loss of forbs important to wildlife during certain times of the year. During weed treatments, environmental changes (e.g., precipitation events, wind shifts) would result in potential unwanted contamination of aquatic environments. Adherence to approved methods and application procedures would minimize the number of contaminates that would potentially harm aquatic wildlife species and invertebrates.

Water Quality, Watershed, and Soils Management

Management actions designed to improve water quality and watershed health would indirectly benefit wildlife and fish species. The avoidance of wetland/riparian areas and other water resources would maintain instream, riparian, and upland habitat conditions. Water quality, watershed, and soils management provides benefits to wildlife by maintaining or restoring habitat conditions through the establishment of avoidance zones around riparian areas and surface use requirements within floodplains.

Rehabilitation and/or reclamation of reservoirs would be required because of the many reservoirs reaching the end of their design life. Many of these reservoirs have silted in or failed. Reconstruction to meet original design specifications, improvement of reservoir function, or reservoir removal and reclamation to reestablish the original topography would be pursued. Improvement to wildlife habitat would include the establishment and restoration of wetland habitat, surface water availability, restoration

of channel function, and/or riparian habitat. Any instream reservoir would alter existing flow regimes and preclude movement of fish and some invertebrate populations.

Water diversion structures and impoundments have been identified as one of the biggest threats to freshwater fauna persistence (Richter et al. 1997). Potential impacts of diversion structures include alteration of flow regimes, riparian areas, associated fish habitat, or barriers to fish movement. In some cases, streams have been completely dewatered for periods of time, rendering the stream unusable to fish and making the riparian area nonfunctional. Loss of fish via entrainment associated with diversions structures is also a potential threat to fish (Moyle and Israel 2005). Management actions to minimize entrainment of fish (e.g., screening) would be considered to minimize the potential for this to occur.

Avoidance of surface disturbing and other disruptive activities within 100-year floodplains; 500 feet from perennial waters, springs, and wetland/riparian areas; and 100 feet from the inner gorge of ephemeral channels, steep slopes, and sensitive soils would act to preserve habitats for various fish and wildlife species occurring in or downstream of these areas.

Head-cut remediation projects and stream restoration (Appendix 11) would potentially displace wildlife and fish, but would be designed to maintain or improve wildlife and fish habitat in the long term.

Impacts of surface discharge of produced waters on the habitats of fish are variable. Both the quantity and quality of discharged waters would determine how fish habitats would be influenced. Discharge of produced waters resulting from natural gas extraction from coal seams would affect fish habitats by altering local hydrologic conditions of receiving waterbodies. The discharge of large volumes of water into ephemeral drainages would lead to stream channel adjustments, such as incision that might simplify channel geometry and reduce the diversity of habitats required by fish life stages (i.e., juvenile rearing habitat, spawning habitats, and refuge habitats). Discharge of poor quality water would affect fish either directly (e.g., through increased water temperatures) or through the processes of bioaccumulation. Fish adapted to highly turbid rivers would be impacted by the discharge of waters with little turbidity. In addition, increased flows that would convert ephemeral streams to perennial streams would favor introduced fish over native fish that evolved in the presence of a highly variable environment. Surface discharge of produced waters in these areas would encourage wildlife to use these areas over longer periods of time (i.e., year round), which could then negatively impact vegetation cover, structure, and forage quantity and quality.

Wild Horse Management

Management of wild horses at appropriate management levels would result in competition with wildlife for forage, water, and habitat. Wild horse gathers would create short-term, localized disturbance to wildlife from human activity related to gathers. Vehicle traffic, helicopter use, wranglers on horseback, and the movements of the wild horses during gathers would all contribute to increased displacement and stress to wildlife. Wild horses forage primarily on grasses, which would reduce competition with antelope and mule deer, which browse primarily on shrubs. Maintenance of the wild and free-roaming nature of wild horses benefits wildlife by promoting open spaces and minimizing fences that result in fewer obstructions to the movement of wildlife across the landscape.

Wild horses that tend to dominate water sources would force wildlife to find alternative water sources. This would displace wildlife into lower quality habitat or force wildlife to travel greater distances to find water. Wild horse use of small, isolated desert riparian and wetland systems would decrease the value of these areas for fish and wildlife as a result of trampling, loafing, and localized overgrazing by wild horses. The capability of these areas to support a diversity of wildlife would be reduced as vegetation cover, structure, and forage quality and quantity are reduced or altered.

Wildlife and Fish Management

BLM, in conjunction with WGFD, would transplant, reestablish, augment, or stock wildlife and fish species to provide genetic diversity and enhance existing populations.

RCAs would be intensively managed to limit disturbance to nesting and breeding raptor pairs as well as other wildlife species. This would provide the opportunity for successful breeding, nesting, and survival of raptors. Additional mitigation measures would be applied to projects and facilities to reduce visual, auditory, and physical disturbances within the RCA.

The incorporation of wildlife objectives in any reclamation activities (Appendix 36) would include specific seed mixes that would allow previously disturbed areas to be used by wildlife in the short term. In the long term, these areas would be returned to a predisturbance vegetation community that would provide structural components beneficial to wildlife species as hiding, nesting, and thermal cover. Appropriate reclamation would restore biological integrity and habitat function that was lost as a result of the initial surface disturbing activity. In addition, reclamation would begin to reestablish connectivity within previously fragmented habitat.

However, maintaining connectivity between contiguous habitat through appropriate placement of facilities and projects would help achieve and maintain ecosystem function. Maintenance of contiguous habitat blocks, as well as corridors between them, benefit a multitude of wildlife species that depend upon large areas of habitat to carry out their life history requirements. In addition, corridors between habitat blocks are important for seasonal movements of wildlife.

Implementation of conservation measures listed in Appendix 14, including all reasonable and prudent measures and terms and conditions, would provide for location of facilities; timing and distance restrictions; OHV designations; monitoring; surveys; no surface occupancy restrictions; project design/redesign; activity restrictions; and best management practices. These measures would provide protections designed to maintain or enhance habitat and reduce or eliminate known factors that contributed to listing under the ESA or Special Status designation, as well as reduce other potential disturbances to these species. Specific actions for Special Status Species are described under each alternative below.

Avoidance of surface disturbing and disruptive activities within potential mountain plover breeding and nesting habitat during the reproductive period, and implementation of mountain plover stipulations and additional protection measures in occupied habitat listed in Appendix 16, would maintain or enhance habitat and reduce or eliminate known factors that would contribute to listing under the ESA.

Maintaining, enhancing, and restoring wildlife habitat, in coordination with the WGFD, USFS, USFWS, and other agencies, would benefit wildlife species by improving forage quality and quantity, increasing hiding cover, and reducing stress during critical time periods. Conservation measures and best management practices for T&E species, proposed and candidate species, sensitive species, and other wildlife would be implemented to promote sound management to conserve and preserve the species and their associated habitat, comply with Section 9 of the ESA, and promote recovery as identified in the provisions of the ESA and BLM sensitive species policies. Impacts to threatened, endangered, proposed, and candidate species have been analyzed in the biological assessment (USDI, BLM 2007a).

4.19.2 Impacts Under Alternative 1: Continuation of Existing Management

Air quality, paleontological, socioeconomic, and visual resource management would have little or no impact to wildlife and fish resources.

Cultural Resources

Land acquisitions intended to preserve cultural resources would generally benefit fish and wildlife resources as a result of the consideration of fish and wildlife habitat requirements during acquisition analysis and subsequent implementation of restrictions associated with the public lands. Avoidance areas (areas within 1/4 mile of a cultural property or the visual horizon, whichever is closer where the setting contributes to the NRHP eligibility), which protect cultural resources by precluding surface disturbing and disruptive activities, would also have the complimentary effect of protecting wildlife habitat that coincide with the protection area.

Fire and Fuels Management

AMR would allow for protection, maintenance, and enhancement of wildlife habitat but also allow for fire to fulfill its ecological role. The use of wildland fire as a component of the ecosystem would promote the return of fire to its natural role of maintaining a diversity of habitat for wildlife. Fire-sensitive vegetation such as bitterbrush, which is an important browse species for big game, are often killed and their composition within the plant community reduced. Under rare conditions, these fires have the potential to burn exceptionally hot, which results in sterilization of soils. This would delay revegetation and result in the long-term loss of wildlife habitat. Wildland fire management for resource benefit would occur on approximately 4,200 acres per year.

Forest Management

Forest management practices, which convert late-seral stage stands to early and mid-seral, would negatively affect species adapted to late-seral forest types. However, forest management practices would create a diversity of seral stages for different wildlife species habitat requirements, thereby increasing habitat for species diversity and richness.

Temporary roads created for commercial timber harvesting would cause habitat fragmentation and disturbance to associated wildlife for the life of the project. However, these roads would be closed and reclaimed after the end of timber harvesting. This would minimize disturbance to wildlife from vehicle travel and human activity. There would be a lag time between closing the roads and subsequent wildlife rehabituation to the adjacent areas; however, these time periods would vary based on species. The reclamation of the roads would decrease the amount of time it would take for native vegetation to reestablish, and thereby facilitate wildlife use of the area.

The layout and timing of timber sales would largely determine the degree of impacts to wildlife habitat. Regeneration of commercial harvested areas begins with early successional stage vegetation, which provides habitat for wildlife species dependent on early successional habitats. The subsequent years would allow for natural seral stage progression of the habitat and thereby provide habitat for various wildlife species that depend on the different seral stages. This natural succession happens over an 80- to 100-year period.

Upgrade of existing access roads for logging operations would temporarily affect aquatic habitats by concentrating stream flow, increasing erosion rates, and fragmenting habitats. Removal of forest

vegetative cover outside of the buffer (500 feet) in watersheds would potentially alter aquatic habitats by changing the time of peak discharge following precipitation events, temperature fluctuations, and increasing sediment transport from upland sources to the stream channel until revegetation has occurred. Therefore, adjacent riparian habitat would potentially be altered, which would benefit some wildlife species by providing unique habitat types, but would not benefit other species, including fish, macroinvertebrates, and amphibians.

The use of forest health management tools (Appendix 19) on approximately 28,000 acres of commercial forest and 85,003 acres of woodland forests would give more flexibility to maintain or improve wildlife and fish habitat. The application of these forest health management tools would occasionally decrease the possibility of catastrophic events, such as wildland fire, that have the potential to negatively affect wildlife and fish habitats. In all timber sales, the needs of fish and wildlife would be considered so that, in the long term, habitat conditions would be maintained or improved. In addition, average size clear-cuts of 10 acres or less with irregular edges would help to ensure diverse and adequate cover for elk and deer. Intensive management of about 6,700 acres that include steep slopes, riparian habitats, and associated buffer zones would help ensure that the habitat requirements of wildlife and fish species are considered during project development.

Lands and Realty Management

Lands and realty management would withdraw 63,670 acres from the operation of the public land laws, including disposal, which would protect a diversity of wildlife and fish habitats.

Land tenure adjustment would consider the disposal of up to approximately 61,010 acres of BLM-administered public lands, which would result in a loss of wildlife or fish habitats from public ownership (Maps 2-22 through 2-25 and Appendix 7). The use of exchange as the preferred method of disposal, consolidation, or acquisition would allow the value of wildlife and fish habitats to be considered before change in ownership. Therefore, impacts would be minimal.

Authorized actions through the lands and realty program would result in loss, degradation, fragmentation of habitat, and displacement of wildlife species from areas disturbed by authorized activities, such as wind energy projects; linear features, such as roads and pipelines; and other permitted facilities, including compressor stations (Cole et al. 1997; Grover and Thompson 1986; Hurley and Sargeant 1991; Leptich and Zager 1991; Lyon 1979; McCorquodale et al. 2003; Rost and Bailey 1979; Sawyer et al. 2005; Unsworth and Kuck 1991). Consideration of sensitive or high-value wildlife and fish habitats in the placement of wind energy developments, facilities, new communication sites, or other permitted actions would help maintain the suitability of habitats for fish and wildlife. Intensive management of disturbing or disruptive activities would include potential timing and spatial stipulations to minimize impacts to wildlife and their associated habitat. Even though stipulations would be applied, project implementation would still result in unavoidable loss of wildlife habitat or displacement of wildlife.

Livestock Grazing Management

Livestock management actions would disturb approximately 900 acres during construction and/or development of range improvements. The majority of disturbance would result from reservoirs and pits, which would eliminate upland wildlife habitat and, in some cases, replace it with riparian habitat. New fences, pipelines, and spring developments would disturb lesser amounts of existing wildlife habitat during construction. New water developments constructed in big game crucial winter range would modify natural movement patterns, which would potentially lead to reduced quantity and quality of available forage for big game the following winter.

Water impoundments would potentially affect fish habitats by altering water temperatures, timing and volume of flow; minimize flushing flows; and alter sediment transport within stream systems. This is dependent on the number, location, and size of impoundments, watershed size, soil types, beneficial uses, and other variables specific to the proposed project area. However, impoundments constructed on intermittent and perennial streams limit movement of aquatic species between required habitats. Because of their highly regulated environment, reservoirs often contain habitat for introduced fish and support salmonid populations that would otherwise be unable to survive in natural systems. These impoundments would potentially act as sources of undesirable species within areas containing sensitive native fish.

The conversion of fences to meet BLM standards during maintenance or reconstruction would reduce injury and entanglement rates of wildlife and decrease stress and energy loss. However, this only occurs on an infrequent basis, affecting about 5 miles per year on average. At this rate of conversion, substantial mortality of big game, especially antelope, would potentially occur during severe winters.

Conversions of cattle or sheep to bison would result in a grazing animal which would have an overlapping diet, primarily with elk and bighorn sheep. In addition, bison create dust wallows to avoid biting flies. The creation of dust wallows would heavily impact vegetation, in small, localized areas, reducing palatability and the amount of available forage for other wildlife species. Fence construction would be modified to control grazing bison. The creation of high-voltage electric fences would create movement barriers for other wildlife species increasing stress, energy loss, and displacement.

Minerals Management

A combination of 857,040 acres of federal oil and gas leaseable lands open to leasing consideration and subject to standard lease stipulations and 2,352,550 acres of federal oil and gas leaseable lands open to leasing consideration and subject to lease stipulations, such as seasonal restrictions, would cause some impacts to wildlife species. Most of the development would occur within high and moderate oil and gas potential areas (Map 4-7). Impacts to wildlife and fish species from minerals management (leaseable, locatable, Common variety minerals) would include habitat loss, degradation, fragmentation, species displacement, and death from collisions associated with increased traffic.

As densities of wells, roads, and facilities increase, the effectiveness of adjacent habitats decreases, until animals completely avoid the area. Animals attempting to forage near development would be subject to heightened stress or flight response that would preclude maintenance of optimum body condition. The avoidance/stress effect impairs function by reducing the capability of wildlife to use the habitat effectively (Oil and Gas Mitigation Working Group, Wyoming Game and Fish Department 2004). These impacts to wildlife and fish management from oil and gas management would be moderate, based on existing protective measures. The use of spatial and temporal stipulations, BMPs, and adaptive management practices would reduce impacts from surface disturbing activities

A combination of 343,140 acres of federal oil and gas leaseable lands open to leasing consideration and subject to lease stipulations (i.e., the 1/4-mile avoidance area around greater sage-grouse leks) and 66,120 acres of federal oil and gas leaseable lands closed to leasing would benefit wildlife species. These avoidance areas would protect species that are dependent on specific habitat types. About 63,670 acres also would be withdrawn from locatable mineral entry, which would benefit wildlife species in these areas. Impacts would be reduced through the use of spatial and temporal stipulations, BMPs, and adaptive management.

Potential water depletions from oil and gas development activities would result in a reduction of instream habitat available to species listed as sensitive by BLM Wyoming. The magnitude of this impact would be

dependent on the volume of water depleted and the location of the depletion within the watershed in relation to the distribution of sensitive fishes.

In addition, some wells are dry holes or abandoned producers, and these areas are reclaimed. After reclamation, these areas would be dominated by herbaceous species, with desirable shrubs established in the long term. Early seral habitats would benefit wildlife species, such as mountain plover and prairie dogs, until later successional stages, when there would be a shrub-dominated plant community.

OHV Management

The use of OHVs would be generally restricted to existing roads and vehicle routes, except for some areas that would be closed or restricted to designated roads and vehicle routes (Map 2-5 – OHV Designations). In addition, OHV use would be allowed off of existing roads and vehicle routes to retrieve big game kills and access camping sites. OHV use would result in displacement and increased stress to wildlife, as well as habitat disturbance. If frequent OHV use occurs during critical time periods, impacts to wildlife would increase, potentially leading to decreased health, death to an individual, or overall population declines. Areas closed to OHV use would help avoid impacts associated with the disruption of wintering big game and other wildlife species.

Within the Dune Ponds cooperative management area, OHV use is authorized in open sand dune areas west of Carbon County road 351, as well as on existing roads and vehicle routes. Impacts to big game species, specifically pronghorn, would be moderate and include displacement and increased stress during critical time periods.

Recreation

Recreation Resource management would provide a 1/4-mile buffer around recreation sites that would be intensively managed. There would also be a NSO stipulation on developed and undeveloped recreation sites for oil and gas leases. In addition, developed recreation sites would be closed to locatable mineral entry, mineral material disposals, and operation of public land laws, including sale. These actions would provide some level of habitat protection from disturbance and displacement around recreation sites. Because of the overall low, unobtrusive activities throughout the year and the limited number of recreation sites, the majority of wildlife would acclimate to these areas, and impacts would be minimal. Individual animals would be negatively disturbed during critical times of the year; however, overall, population disturbance would be minimal.

Special Recreation Management Areas

The Shirley Mountain SRMA, Continental Divide National Scenic Trail SRMA, and North Platte River SRMA would be retained, which would increase recreation in these areas and increase human disturbance to wildlife. Shirley Mountain SRMA and North Platte River SRMA would limit OHV use to designated roads and vehicle routes. This action would prevent the proliferation of new vehicle routes, which would reduce disturbance to wildlife and their habitat. Intensive management of surface disturbing activities within the Shirley Mountain SRMA and North Platte River SRMA would provide additional protections to wildlife.

Special Designations/Management Areas

Wilderness Study Areas

Motorized vehicle use in the Adobe Town WSA are limited to designated roads and vehicle routes, and the Prospect Mountain WSA, Bennett Mountains WSA, and the Encampment River Canyon WSA would be open to all types of motorized use on existing roads and vehicle routes. Temporary displacement and

increased physiological stress would occur from vehicle use on existing or designated vehicle routes. However, due to the limited number of open roads, impacts would be minimal.

Wild and Scenic Rivers

Actions to manage all eligible river segments to protect their values and tentative classifications until suitability determinations are made would maintain and protect wildlife habitat in its present conditions.

Other Special Designations/Management Areas

In general, actions associated with the SD/MAs would all benefit wildlife species and/or habitat to one degree or another. Surface disturbance restrictions, OHV management, modifying fences, intensive management for natural gas and oil development, seasonal closures, and anti-perch devices for raptors protect wildlife species by reducing and/or removing disturbance year round and during critical time periods, allowing easier physical passage for wildlife during movements and migrations, and eliminating electrocution for raptor species from power lines. The implementation of land exchanges when opportunities arise provides for more efficient management for wildlife species habitats and allows the implantation of protection measures, such as implementing seasonal timing closures and avoidance measures. Wildland fire would be based on AMR and would allow for protection, maintenance and enhancement of natural and cultural resources, and also allow fire to fulfill its ecological role. Specific analysis is discussed in further detail under individual SD/MAs.

Management of wetland areas within the High Savery Dam area (530 acres) would benefit wetland-dependent species such as waterfowl and neotropical migratory birds, as well as wildlife species that use these areas to fulfill a portion of their habitat requirements. The management of riparian habitats within the High Savery Dam area (under the current MOU) would also provide habitats that support a recreational trout fishery below the reservoir.

Existing ACECs, including Jep Canyon, Sand Hills, and Shamrock Hills, would provide additional protections to the wildlife species that inhabit these areas through additional measures applied to important habitat.

The other areas proposed as SD/MAs (Cave Creek Cave, Chain Lakes, Jep Canyon, Laramie Peak, Red Rim/Daley, Wick-Beumee, Pennock, Laramie Plains Lakes, Blowout Penstemon, Upper Muddy Creek Watershed/Grizzly, and White-Tailed Prairie Dogs) would be managed for multiple uses and would be subject to all standard mitigation measures. These measures prohibit disturbance to wildlife during critical time periods but afford no protection to the habitat.

Avoidance areas (areas within 1/4 mile of the historic trail or the visual horizon, whichever is closer where the setting contributes to the NRHP eligibility), which protect the trails by precluding surface disturbing and disruptive activities, would also have the complementary effect of protecting wildlife habitat that coincides with the protection area.

Management actions designed to protect Cave Creek Cave would be implemented to control and protect sensitive resources, such as the cave and associated riparian habitat, for a diversity of wildlife species. Seasonal closure of Cave Creek Cave to human use from November 1 to March 31 would protect the existing bat hibernaculum. The application of research, including the reintroduction of species, would be designed to understand the ecological systems and processes and implement a diversity of management actions to return these to a healthy, functioning state.

Transportation and Access Management

Transportation and access management would not restrict road densities. Increased traffic and road densities would increase the potential for collisions with wildlife, habitat fragmentation, and wildlife displacement.

Vegetation Management

Vegetation treatments would be designed to provide diverse habitats for various species of wildlife. For example, in vegetative climax communities, fire would return the vegetative community to an earlier stage of succession that is beneficial to some wildlife species. However, the low amount of acres treated annually (2,500 acres) would still result in a dominance of mature-decadent habitats available to wildlife during the life of the plan. These late-seral stage vegetation stands would provide hiding cover, protection from the weather, and breeding habitats for many wildlife species. Wildlife species that prefer early- and mid-seral stage stands of vegetation would only benefit in locations where treatments occur.

Mechanical treatments would reduce encroachment into shrublands, aspen, and riparian habitat to maintain a mixture of plant communities and vegetative structure that support a wider diversity of wildlife. However, the level of these treatments would not keep pace with succession and the value of these habitats to wildlife would continue to decline.

Special Status plant species management would preclude wildlife browsing when exclosures are required to protect habitat. Currently, 10 acres are excluded from grazing to protect Gibben's beardtongue (*Penstemon gibbensii*).

Noxious and invasive weeds would establish new populations due to increased surface disturbance associated with increased development. In addition, limited resources are available to control and prevent their spread into native plant communities. Spread of noxious and invasive weeds would negatively affect wildlife through loss or alteration of habitat, reduction in habitat diversity and forage, and increased foraging by wildlife in areas that might have lesser value habitat. Approximately 2,800 acres would be treated annually to control noxious and invasive weeds. This would not be sufficient to control the spread of noxious and invasive weeds into all wildlife habitats, but would maintain or improve wildlife habitat in treated areas.

Water Quality, Watershed, and Soils Management

Off-channel evaporation and percolation reservoirs for disposal of produced waters would replace upland wildlife habitats and require future reclamation. As these reservoirs dry in response to decreased water disposal, they would concentrate salts and trace metals to the point of toxicity for migratory birds and aquatic organisms.

Additional impacts associated with the discharge of waters produced from oil and gas development in the Colorado River and Platte River Basins would include simplification of stream channel morphology (i.e., channel incision and loss of pools, runs, and riffles), resulting in a loss of native fish habitat. Water quality would potentially change over time and alter the existing aquatic ecosystem. Bioaccumulation of chemicals from CBNG waters over time would cause reduced viability of fish and wildlife populations.

Wild Horse Management

Impacts to wildlife and fish management from AML of 70 adults in the Lost Creek HMA would be moderate. Wild horses would directly compete with wildlife for water, forage, and habitat requirements.

Wild horses would also contribute to riparian/wetland habitat degradation, which reduces the suitability of these habitats for wildlife and fish species.

Wildlife and Fish Management

As a component for implementing Standards for Healthy Rangelands, emphasis would be placed on wildlife distribution. This would include guzzler/water development specifically designed for wildlife that would increase usable habitat for some species. Improved water availability would increase the distribution of animals across the landscape, reduce competition for forage and space and, thereby, lead to an increase in some wildlife populations.

Measures that preclude surface disturbing activities during critical time periods would continue to reduce disturbance to breeding, nesting, and wintering raptors. Intensive management actions within RCAs would continue to reduce physical disturbance of raptor habitat and disturbance to the birds. The seasonal restrictions for active raptor nests and raptor nesting restrictions would continue to reduce impacts to most nesting raptors. However, these restrictions do not reflect species-specific requirements and do not adequately protect some species. The nesting chronology of some species extends beyond July 31, and therefore the potential exists for disturbance to these species during the nesting period, potentially resulting in nest failure or abandonment.

The use of BMPs for neotropical migratory birds, other migratory birds, upland game birds, amphibian species, reptiles, and their habitats to mitigate the adverse effects of surface disturbing and other disruptive activities would help to maintain habitats suitable to meet the life history and habitat requirements of these species (Appendix 15).

Development activities would not be allowed within identified big game parturition areas between May 1 and June 30, which would eliminate disturbance to these species only during this period. Development would be allowed in big game parturition areas outside of this time period, which would fragment habitat and reduce overall habitat quality and use of the area in the long term.

Restricting surface disturbing and other disruptive activities within crucial winter range during the winter months would reduce the stress to big game during these critical times. However, loss or alteration of this habitat outside these periods would not be restricted. This prohibits disturbance to the big game during critical time periods but affords no protection to the habitat.

Fences are livestock management tools that limit grazing animals to specific areas while providing for the needs of other resource values. Fences create travel barriers that alter animal use patterns, cause energy loss and stress, and occasionally lead to death of big game from entanglement or injury. They also create obstructions for birds to fly into and serve as perches for songbirds and raptors. The conversion of fences to meet BLM standards would decrease wildlife energy loss and stress, injury, entanglement, and mortality. However, existing fences that do not meet current BLM standards would continue to impede movement of big game species and other wildlife.

Water developments for livestock would potentially attract wildlife into areas that formerly lacked water sources and were only seasonally utilized. Water improvements that lack water controls (e.g., reservoirs), located in the big game crucial winter range, would retain big game longer in these areas; consequently, the quantity and quality of available forage would be decreased the following winter. New water developments alter livestock use patterns, which would influence wildlife use of these areas because of a decrease in available forage.

Avoidance of surface disturbing and other disruptive activities within 100-year floodplains; 500 feet from perennial waters, springs, water wells, and wetland/riparian areas; and 100 feet from the inner gorge of ephemeral channels, steep slopes, and sensitive soils would act to preserve habitats for various amphibian species occurring in or downstream of these areas.

Fisheries management actions would coincide with WGFD, USFS, USFWS, and existing or new conservation strategies for fish species. Management actions within the Colorado River Basin would adhere to the range-wide conservation agreement for roundtail chub, bluehead sucker, and flannelmouth sucker (Utah Department of Natural Resources 2004). In addition, management would consider the goals and objectives set forth by the conservation agreement and strategy for the Colorado River cutthroat trout (CRCT Conservation Team 2006). This would improve habitat as well as reestablish and maintain populations of sensitive fishes.

In-channel impoundments change the hydrologic regime of the watershed and impact fish habitats by altering water temperatures and timing and volume of flow, minimizing the effects of flushing flows, and altering sediment transport within the system. Because of their highly regulated environment, reservoirs often contain habitat for introduced fishes that would otherwise be unable to survive in an unregulated system. These impoundments can, in turn, act as sources of undesirable species within areas containing Special Status or desirable fishes. In addition, impoundments, instream structures, or linear crossings constructed on streams containing populations of fish, invertebrates, or amphibians would in some cases limit movement among required habitats. Where negative effects on habitat quality, quantity, or the life history requirements of fishes resulting from the construction of impoundments, instream structures, and linear crossings cannot be mitigated, fragmentation and impairment of fish habitats would occur. Attempts to minimize the impacts of fish barriers and instream structures on fish populations would cause occasional adverse impacts to Special Status or desirable fish populations as a result of habitat alteration, habitat fragmentation, and spread of exotic fishes. Management actions to minimize disturbances to wildlife during sensitive life cycles can be found in Table 2-10 (Seasonal Wildlife Stipulations for all Surface Disturbing Activities).

Black-footed ferret surveys within identified prairie dog towns would identify this endangered species prior to any surface disturbing activities. Identification efforts would ensure that adequate protective measures would be applied to ensure minimal impacts to habitat.

Prairie dogs would receive general protection by avoiding, where possible, surface disturbing and disruptive activities within active prairie dog towns. However, there would be no buffer zones associated with prairie dog towns and, therefore, potential displacement of the animals would occur. Power lines within active prairie dog towns would be equipped with raptor anti-perch devices. This would reduce raptor predation on prairie dogs. However, other above-ground facilities would not require raptor anti-perch devices. This would increase the predation of prairie dogs.

Boat and raft landing areas would not be developed and outfitting camps would be avoided in western yellow-billed cuckoo habitat, where possible. This would reduce disturbance to the cuckoo and its associated habitat. Conversely, surface disturbing and disruptive activities would not be prohibited within 1/2 mile of identified habitat from April 15 to August 15 for the protection of nesting cuckoos. As a result, this would potentially lead to reduced nesting and nestling survival. Because of the limited amount of habitat within the RMPPA, the amount of disturbance is expected to be minimal.

Surface disturbing and disruptive activities would be allowed within 1/4 mile of an active grouse lek in extremely rare instances. Development located within 1/4 mile of an active greater sage-grouse lek has the potential to displace strutting males and interfere with the social dynamics of the breeding birds. Therefore, these disturbances would be located in the least disruptive location from the lek. In addition,

elevated noise levels audible at any given lek would interfere with females locating the leks. This would reduce the reproductive success of the greater sage-grouse using these leks. Locating facilities and maintenance activities away from the lek or otherwise mitigating the noise levels (i.e., using mufflers or screens) would decrease this impact. Seasonal restrictions would reduce potential impacts to both breeding and nesting grouse from construction activities. However, surface disturbing and disruptive activities would be allowed outside of these seasonal stipulations, which would remove the amount of available habitat for breeding and nesting grouse.

Surface disturbing and disruptive activities that would result in stream channel instability, erosion, and sedimentation within known western boreal toad habitat would be avoided. These impacts would be minimal because of other riparian protection measures and because the boreal toad habitat only occurs above 7,500 feet in elevation.

Summary

Livestock management actions would create new water sources which, in dry seasonal ranges, would expand available habitat for wildlife but would potentially decrease forage value and structure in big game crucial winter and transitional ranges and greater sage-grouse winter ranges. Construction of reservoirs would potentially create new fisheries habitat while degrading instream habitat for native fishes. Continuation of fence conversions at the current rate would still contribute to large die offs of antelope and other big game species during severe winters. Competition for water, forage, and space would occur between livestock and wildlife. Minerals development would continue to impact wildlife and fish through loss, alteration, and fragmentation of habitats and displacement of wildlife. The increased number of roads and pipelines would lead to additional habitat loss and fragmentation. In addition, surface disposal of waters from oil and gas activities would alter local hydrologic processes and fish habitats. Vegetation and weed treatments would result in the localized improvement of wildlife and fish habitats. Spatial and temporal timing restrictions and BMPs would be implemented to minimize impacts to greater sage-grouse, raptors, big game, and their associated habitats. However, timing stipulations protect habitat during the stipulated time period, and offer no protection throughout the rest of the year. Activities associated with management actions would contribute to the loss, alteration, and fragmentation of wildlife and fish habitat.

4.19.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Air quality, paleontological, WSR, socioeconomic, and visual resource management would have little or no impacts to wildlife and fish resources.

Impacts from cultural resource management; OHV management; SD/MAs (except those listed below); transportation and access; water quality, watershed, and soils management; and wild horse management would be the same as those described under Alternative 1.

Fire and Fuels Management

Fire and fuels management would emphasize suppression of all wildland fires regardless of ignition source. Suppression activities decrease the opportunity for wildland fire to maintain its natural role in the ecosystem, which would result in late seral stage dominance. This would benefit those species that are dependent on these ecosystems for food and hiding cover.

Forest Management

Impacts from forest management would be the same as those described under Alternative 1, except that the allowable timber harvest would increase. This would open larger spaces in the forest, which would benefit those species which require early seral-stage plant communities. In addition, a reduction in seasonal restrictions for wildlife would result in a greater degree of impact than what was described in Alternative 1.

Lands and Realty Management

Impacts associated with lands and realty management would be the same as those described in Alternative 1 with the following exceptions:

Withdrawals of a 57,270 fewer acres from the operation of the public land laws, including disposal, would reduce the level of protection to wildlife and fish habitats as compared with Alternative 1.

Land tenure adjustment would consider the disposal of up to approximately 46,230 acres of BLM-administered public lands, which would result in a loss of wildlife or fish habitats from public ownership (Maps 2-26 through 2-29 and Appendix 7).

A reduction in seasonal restrictions for wildlife would result in a greater degree of impact than what was described in Alternative 1.

Livestock Grazing Management

Roughly 1,140 acres of habitat would be disturbed during the construction of range improvements under Alternative 2. The reduction in seasonal restrictions and the increased number of surface disturbance acres would result in higher levels of fragmentation and wildlife displacement. Emphasis on livestock production would result in additional water and pasture fence developments to increase forage use by livestock. This would increase direct competition for forage and space, particularly between cattle and elk. Wildlife would potentially be displaced to lower quality habitats, and inter- and intra-species competition would increase within these habitat types. Wildlife species which prefer habitats with shorter herbaceous structure, following grazing, would benefit. Conversely, increased grazing of grasses would potentially lead to an increase in shrub-dominated communities which, benefit other wildlife species. Meeting rangeland health standards that require habitats to support a diversity of native plant and animal species and that maintain or enhance habitat for threatened or endangered species, species of special concern, or sensitive species would benefit all wildlife species.

Range improvements would continue to be small in scale, with minimal amounts of associated surface disturbance. In the immediate vicinity of any new water developments, livestock use would reduce available forage and cover for wildlife and shift livestock use from adjacent locations. Additional water sources would provide opportunities to adjust livestock grazing to allow vegetation to improve in production and cover, increase litter, and complete reproductive cycles. Case-by-case examination of all management actions would analyze the potential effects, ensuring that these actions would not result in degradation of the vegetation communities and the habitat it provides for wildlife and watershed health. Potential impacts (e.g., non-native fish, movement barriers, and habitat alteration) to native fish assemblages will be considered for all water development projects.

Minerals Management

Impacts from mineral extraction activities would be the same as those described in Alternative 1, except that there would be a greater degree of impact. The reduction in seasonal restrictions and the increased

number of surface disturbance acres would result in higher levels of habitat fragmentation and wildlife displacement than described in Alternative 1.

Recreation Management

Special Recreation Management Areas

The OHV SRMA (ND acres) would be developed and would promote education programs that would reduce disturbance to wildlife and their habitat.

Special Designations/Management Areas

Other Special Designations/Management Areas

Under this alternative, existing NNLs, and two of the SRMAs remain designated, whereas the High Savery Dam (530 acres) and the Chain Lakes WHMA (30,560 acres) would be managed under the current MOU; therefore, impacts would be the same as under Alternative 1. Without the special designations, the previously designated ACECs with special wildlife values would need additional emphasis of cooperative management to maintain or enhance the values for wildlife. In areas of mixed land ownership patterns, wildlife habitat management objectives might not be compatible among all affected interests.

Surface disturbing activities would be allowed within white-tailed prairie dog towns. Activities allowed within these towns would potentially destroy burrows which would affect burrowing owl, badger, swift fox, mountain plover, and other wildlife which use the open areas to nest and forage. Restrictions for the Cave Creek Cave area would reduce disturbance to wildlife and loss or alteration of their habitat and benefit the cave ecosystem. In addition, seasonal closure of Cave Creek Cave to human use from November 1–March 31 would protect the existing bat hibernaculum.

Vegetation Management

There would be an increase in vegetation acres treated (about 24,400 acres annually). The size of the treatment areas would be larger, as compared with Alternative 1. This would result in a mixture of early, mid- and late-seral condition classes of vegetation. The rejuvenation of older, decadent shrub communities would increase plant vigor, species composition, and age class structure that benefit species such as mule deer and greater sage-grouse. Conversely, the loss of late succession vegetative communities would result in a reduction of habitats available to species requiring expansive tracts of contiguous late-successional habitat, such as the sage thrasher and sage sparrow. Management of aspen to promote early seral conditions would benefit wildlife species that utilize the herbaceous component and young aspen trees. Conversely, wildlife which uses older and larger trees, such as cavity nesting species, would be negatively impacted through the removal of these trees.

The spread of noxious and invasive weeds would affect wildlife through loss of habitat, reduction in habitat diversity and forage, and increased foraging by wildlife into other areas that might have lesser-value habitat. However, roughly 25,646 acres would be treated annually, which would reduce these impacts. Treatments would slow the proliferation of existing weed species and the introduction of new weed species into new areas until all areas received treatments.

Wildlife and Fish Management

Impacts from wildlife and fish management would be the same as those described under Alternative 1, except for the following. Facilities that require repeated human presence would be allowed near raptor nests, and the distance buffer for seasonal restriction would decrease to 1/2 mile for all species. This would increase the potential to disturb nesting raptors which would lead to nest abandonment and lower

fledgling recruitment. Timing stipulations would vary by species to provide protection during sensitive life cycles. This would increase protection for burrowing owls and goshawks during nesting and fledging.

RCAs would be open to oil and gas development, and surface disturbing and disruptive activities would not be intensively managed. This would increase physical disturbance to nesting habitat and lead to increased nest abandonment and lower fledgling recruitment.

There would be no timing and spacing restrictions to surface disturbing and other disruptive activities located in crucial winter range, parturition habitat, and greater sage-grouse/Columbian sharp-tailed grouse breeding, nesting, and wintering habitat. This would potentially negatively impact the biological integrity and habitat function of terrestrial and aquatic ecosystems. Surface disturbing activities from a diversity of land management actions in these habitats would result in loss or alteration of these high-value wildlife habitats and increased stress, displacement of species, and lower reproductive success of wildlife.

Existing fences would not be modified in migration corridors. As a result, injury and entanglement rates would remain the same. Construction of new fences in big game migration corridors would meet BLM fence standards. New fences would impede big game movements as well as increase energy loss and stress, injury, entanglement and mortality.

Water developments for livestock and wild horses would be allowed within big game crucial winter range. These improvements would retain big game longer in these areas.

Surface disturbing and disruptive activities would be allowed within prairie dog towns. This would reduce the number of available burrows that would potentially be nest sites for burrowing owls. Reducing prairie dog populations would also reduce the amount of prey base for predatory wildlife species, such as eagles and badgers.

Surface disturbing and disruptive activities within 2 miles of greater sage-grouse leks and 1 mile of Columbian sharp-tailed grouse leks would be allowed between March 1 and July 15. This would disturb nesting females and lead to increased nest abandonment and lower recruitment rates.

Summary

An increase in acres of land disturbed is anticipated under Alternative 2, primarily because of increased disturbance, reduced protection measures, and increased areas of potential surface disturbing activities. Negative impacts would result from lands and realty management, minerals management, and reduced restrictions necessary to protect wildlife and habitat. In addition, impacts would result from livestock management, forest management, fire and fuels management, vegetation management, OHV management, recreation management, and wild horse management. In general, increased impacts to wildlife species would result from decreased habitat uses, reduction in wildlife numbers, reduction in health and productivity of species, increased loss of important vegetation communities to support a diversity of wildlife, and inability to manage wildlife habitat sufficiently to support a diversity of species.

4.19.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Air quality, paleontological, socioeconomic, and visual resource management would have little or no impact to wildlife and fish resources.

Impacts from forestry, SD/MA (except those listed below), transportation and access and wild horse management under this alternative would be the same as under Alternative 1.

Cultural Resource Management

Impacts from cultural resource management would be the same as those described under Alternative 1, except that surface disturbing activities would not be allowed within 1/4 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility. This would provide additional protection for wildlife habitat that occurs within those protected areas.

Fire and Fuels Management

AMR would emphasize the use of wildland fire for resource benefit for all natural ignitions. Approximately 10,600 acres would be burned annually from wildland fire as a result of decreased suppression activities, which would increase the influence of wildland fire in natural ecological processes. Larger fires would result in decreased edge habitat and smaller mosaic patches than with a greater number of smaller fires. In general, with decreased fire suppression activities, there tends to be an increase in the potential for larger burned areas to occur. This would increase early successional communities and benefit those wildlife species that require these habitat types.

Lands and Realty Management

Adverse impacts to wildlife habitat from development activities associated with lands and realty actions would be greatly reduced under Alternative 3. Areas with important wildlife values would be closed to new wind energy development, utility/transportation systems, and communication sites (384,030 acres—Map 2-32). Closure of these areas would offer the greatest protection to wildlife habitat from these types of surface disturbing activities.

Impacts from lands and realty management would be the same as those described in Alternative 1, except there would be an additional 206,940 acres withdrawn from operation of the public land laws.

Maintaining valued wildlife and fish habitats located in isolated tracts in public ownership would contribute to the ability to provide small islands of suitable habitat for species of management concern such as T&E and sensitive species.

Livestock Grazing Management

Livestock grazing management would emphasize achieving DPC objectives, which would incorporate consideration of wildlife and fish habitat requirements to enhance viability of fish and wildlife populations. The construction of range improvement projects, including water developments, fence construction, and vegetation manipulation projects, would disturb about 420 acres. There would be an emphasis on offsite water developments and protection of existing springs and seeps, which would promote livestock use away from riparian areas to improve these Critical habitats for fish and wildlife. Small-scale water developments would be designed to benefit wildlife, as well as livestock. Large reservoirs capable of supporting game fish populations would not be constructed, which would also maintain native fish populations in streams by not altering the natural hydrology. There would be no new water developments constructed in crucial winter range. This would reduce forage competition between big game and livestock where diet overlap occurs. However, this would also possibly lead to increased herbaceous dominance and decreased shrub cover as a result of reduced grazing of cattle in localized areas.

There would also be an emphasis on modification of all fences to BLM standards. This action would reduce stress, energy loss, injury, and mortality to big game species (particularly antelope) during movement and migrations. Modification of all fences to BLM standards without exception would improve passage of big game through fences while reducing the negative effects listed above. However,

the lack of stronger fences in areas with higher pressure from livestock would result in livestock use occurring in fish and wildlife habitat that would otherwise be rested and increase competition between them in these areas. Elimination of new fence construction in migration corridors would not create any additional fence barriers to big game movement and, therefore, would not increase the potential for additional stress, energy loss, injury, or mortality of big game to occur.

Conversions of cattle or sheep to bison would not occur in blocked public land (Map 34), eliminating the potential for diet overlap between bison and elk/bighorn sheep and intra-species competition between bison and other wildlife. Reintroduction of an animal species formerly present in local habitats and that were an integral part of local wildlife ecology would not occur in these areas.

Minerals Management

An increase of 194,800 acres from Alternative 1 is subject to lease stipulations for resource protection. This would provide increased protection to wildlife and their associated habitat. Closure of 86,210 acres to leasing would reduce disturbance from development to fish and wildlife species. NSOs would protect wildlife by eliminating surface locations in critical areas. In addition, about 271,110 acres would be closed to locatable mineral entry under proposed withdrawals, which would reduce disturbance to wildlife species in these areas (Table 2-10 “Seasonal Wildlife Stipulations for all Surface Disturbing Activities”).

OHV Management

Impacts from OHV management would be the same as those described under Alternative 1, except that OHV use to retrieve big game kills and to access campsites would not be allowed off of roads or vehicle routes and more areas would be closed to OHV use. These actions would decrease disturbance and displacement to wildlife and their habitat during critical time periods.

Recreation Resource Management

An NSO buffer around recreation sites would protect wildlife habitat by eliminating the potential for displacement and disturbance from development activities. However, these sites would generally be low wildlife use areas for some species because of the presence, activity, and noise associated with recreation sites of humans. In general, recreation sites are not used year round; therefore, impacts to most wildlife species would occur mainly during peak recreational times.

Special Recreation Management Areas

Impacts to wildlife from SRMA management actions would be the same as Alternative 1 except the following. The North Platte River SRMA and Shirley Mountain SRMA would be expanded, which would increase the area of protection. The Laramie Plains Lakes area, Rawlins Fishing area, Pedro Mountains area, and Jelm Mountain area would all be managed as SRMAs. These actions would reduce disturbance to wildlife and associated habitat

Special Designations/Management Areas

Wilderness Study Areas

All WSAs would be closed to motorized vehicle traffic, which would reduce disturbance and stress to wildlife from driving on existing two-tracks. It would also eliminate alteration of habitats from vehicle use. Limiting travel to access on foot or horseback would reduce stress, noise, and displacement impacts on wildlife.

Other Special Designations/Management Areas

The creation or maintenance of ACECs and WHMAs for the protection of wildlife and their associated habitat would provide additional protections to those areas identified as having important values. Intensive management of surface disturbing and other disruptive activities associated with existing oil and gas leases would reduce impacts to wildlife habitats by minimizing surface disturbing activities and/or applying additional protection measures (Appendices 1, 15, and 26). Avoidance of human presence and activity from construction and operation of oil and gas facilities during certain times of the year would reduce stress and anxiety to wildlife and reduce flight or displacement distances exhibited by big game and wildlife in general when alarmed. Many of the ACECs would be closed to all new oil and gas leasing, locatable mineral entry, and operation of the public land laws. However, many ACECs are currently leased. The likelihood of some of the areas being developed is high, based on existing proposals and the high and moderate potential (Map 4-7 oil and gas potential Map). Intensive management of existing oil and gas leases would provide some protections to wildlife habitat; however, there would still be impacts, similar to those described in Alternative 1. Offroad vehicle travel for "necessary tasks" would not be allowed, which would reduce disturbance and stress to wildlife and eliminate alteration of habitats from vehicle use.

Other actions that would be implemented in the areas discussed above include limiting access to designated roads and vehicle routes and closing the area to over-the-snow vehicles in Jep Canyon, which would benefit big game and other wildlife species by reducing the amount of human-wildlife conflicts, such as disturbance to wildlife during breeding, migration, and wintering sensitive time periods, from vehicle uses, hunting, recreation, and mineral development activities. Plans of operation for locatable and saleable minerals in the Laramie Peak ACEC would influence when and where disturbance occurs, and identify actions taken to reduce the overall impacts to wildlife habitat. Timber harvesting would not be allowed within 1/2 mile of the Cave Creek Cave ACEC, which would allow the riparian area to remain undisturbed, protecting habitat values important to bat species. Livestock grazing would be managed to meet ACEC objectives in the Laramie Plains Lakes area, which would maintain and enhance potential Wyoming toad habitat. Fire management activities would be used to maintain early-seral conditions to maintain or enhance blowout penstemon habitat, which would also enhance habitat for wildlife.

The existing Sand Hills ACEC (7,960 acres) boundaries would be expanded to include the JO Ranch acquisition (total 12,680 acres). The area would be developed as an interpretive site, which would increase human presence, potentially increasing disturbance to wildlife. Surface disturbing activities would be prohibited in the unique vegetation complex (subject to valid existing rights), which would further protect the wildlife habitat.

Maintaining the integrity of the Shamrock Hills RCA (18,400 acres) to protect nesting raptors and other wildlife species would benefit wildlife and their habitats. Closure to locatable mineral entry and mineral material disposals would reduce disturbance to wildlife and loss or alteration of their habitat.

In the Stratton Sagebrush Steppe Research ACEC (5,530 acres), intensive management of surface disturbing and other disruptive activities associated with existing oil and gas leases would reduce impacts to wildlife habitats by minimizing surface disturbing activities and/or applying additional protection measures.

Management of the Red Rim-Daley ACEC (11,100 acres) would provide benefits to wildlife by allowing protection of crucial winter range habitat for pronghorn, as well as seasonal habitat for greater sage-grouse, mule deer, and other wildlife.

Management of Historic Trails ACEC (66,370 acres) would benefit wildlife habitat by closing areas within 1/4 mile of contributing portions of the trail to locatable mineral entry and mineral material

disposals. Any action to avoid or prevent disturbance to contributing segments would preclude surface disturbance and therefore maintain wildlife habitat components.

Management of the Upper Muddy Creek Watershed/Grizzly ACEC (59,720 acres) would provide benefits to fish and wildlife by pursuing expansion of reintroduction efforts for native warm water and coldwater fishes into adjacent habitats and promoting the enhancement of seasonal and crucial winter range habitats for big game in this area. Surface disturbance would be avoided within 1/4 mile of all stream channels to minimize impacts to riparian habitats and associated fish and wildlife species. Where disturbance from linear features in these areas cannot be avoided, intensive management would be applied to minimize disturbance to fish and wildlife habitat. Removal, reconstruction, or retrofitting instream structures that are found to interfere with the movement of native fishes would help to ensure that the upper Muddy Creek watershed functions as a series of connected habitats supporting the diversity of habitats necessary for native fishes to meet their life history and habitat requirements. Designation of the Upper Muddy Creek Watershed/Grizzly area as an ACEC would, through management prescriptions and habitat objective-setting, significantly contribute to the conservation of four of the five BLM sensitive fishes found in the RMPPA. Pursuing opportunities to expand reintroduction efforts for Colorado River cutthroat trout and other native cold and warm water fishes into adjacent habitats within the Muddy Creek watershed would further act to ensure the viability of native Colorado River Basin fish populations.

Management of the White-tailed Prairie Dog ACEC would increase the protection of the species within these areas. There would be a 50 meter buffer of prairie dog towns for all surface disturbing and disruptive activities. No above-ground facilities would be allowed within 1/4 mile of prairie dog towns, unless the facilities are equipped with raptor perch inhibitors. This action would protect white-tailed prairie dogs from raptor predation. Some roads would be closed in order to meet the specific objectives of the ACEC. Furthermore, prairie dog poisoning would not be allowed except for instances of demonstrated threats to human health and safety.

Management of the High Savery Dam and Reservoir ACEC (530 acres) would be the same as those described under Alternative 1, except that this area would be closed to locatable mineral entry and mineral material disposals, which would reduce disturbance to fish and wildlife and their habitat. The area would be closed to land tenure adjustments, which would ensure these areas remain as public wildlife habitat.

Vegetation Management

Vegetation management actions would achieve DPC objectives in addition to meeting rangeland health standards. Emphasis on habitat requirements would increase the suitability of the habitat to enhance wildlife and fish populations. The size of the treatments would be smaller and more numerous and increase edge effect and mosaic patterns. A fivefold increase in vegetation acres treated (11,800 acres annually) would result in habitat alteration, which improves vegetation diversity and benefits the largest number of wildlife species.

Controlling noxious and invasive weeds would benefit wildlife habitat by maintaining natural species diversity, cover, structure, and nutritional value. Approximately 28,542 acres would be treated annually to control noxious and invasive weeds, to meet wildlife habitat objectives.

Water Quality, Watershed, and Soils Management

Impacts from water quality, watershed, and soils management would be the same as those described under Alternative 1, except surface discharge of produced waters from oil and gas development activities

would not be allowed in the Colorado River Basin. This would reduce erosion, head-cuts, and sedimentation of spawning areas, and maintain hydrologic function for fish habitat.

The discharge of waters produced from CBNG development in the North Platte River drainage and Great Divide Basin would not be considered unless specific BLM land use objectives would be achieved. This would include reducing potential contamination of water sources, erosion, head-cuts and sedimentation in consideration of fish and wildlife management goals.

By restricting water impoundments in the Muddy Creek Watershed (Map 2-20) that result in an annual water loss and/or storage of greater than 1 acre-foot per project in Muddy Creek, natural hydrologic conditions would be preserved, which would maintain the quantity and quality of fish habitats at their present levels.

The protection afforded the Encampment River Watershed would act to preserve habitats for various fish and wildlife species that use this area.

Wildlife and Fish Management

Impacts associated with wildlife and fish management would be the same as those described in Alternative 1, except for those described below.

The elimination of animal damage control by APHIS would potentially result in an increased density of predators to prey until natural population cycles are achieved. Species with high reproduction potential, such as prairie dogs or jackrabbits, would overutilize the vegetative resources; however, over time this cycle would balance itself out.

Facilities that require repeated human presence would not be allowed within 1/4 mile of active raptor nests, and the seasonal timing restriction buffer would be increased to 1.5 miles. This would reduce the potential to disturb nesting raptors, thus increasing nesting and fledgling success. In addition, timing stipulations would vary by species to provide protection during the nesting season.

RCAs would be closed to new oil and gas leasing. Surface disturbing and disruptive activities on existing leases would be intensively managed through the use of BMPs. Closing RCAs to new leasing and intensively managing existing leases would lead to increased nesting rates and fledgling survival.

Surface disturbing and disruptive activities prohibited within identified big game parturition areas would protect these areas from disturbance. This would increase survival rates of fawns, calves, and lambs. Development activities within migration/transition ranges would be intensively managed to prevent the loss of crucial habitats, reduce stress, and allow big game species to migrate between summer and winter ranges more efficiently. These actions would allow animals to select preferred habitats and reduce displacement into lower quality habitat that provides less thermal cover and reduced forage quantity and quality.

All fences would be modified to meet BLM standards, which would reduce injury or entanglement to wildlife. New fences would not be allowed in migration corridors. This would allow big game species to migrate between summer and winter ranges with reduced stress and displacement.

Water developments for livestock and wild horses would not be allowed in crucial winter range, which would minimize the amount of disturbance to wildlife during sensitive time periods. In addition, this would reduce the amount of livestock utilization and increase the amount of available forage and cover for wildlife. Restriction of new water developments would maintain current distributions of wildlife

populations throughout the landscape and allow natural movement between watering areas. This would limit over-utilization, and reduce the likelihood of disease transmission.

Exclusion of surface disturbing and other disruptive activities from identified 100-year floodplains, areas within 500 feet of perennial waters, springs, water wells, and wetlands and areas 100 feet from the inner gorge of ephemeral drainages would maintain the functionality of aquatic ecosystems for various amphibians, fish, and wildlife species.

In-channel impoundments change the hydrologic regime of the watershed and impact fish habitats by altering water temperatures and timing and volume of flow, minimizing the effects of flushing flows, and altering sediment transport within the system. Because of their highly regulated environment, reservoirs often contain habitat for introduced fishes that would otherwise be unable to survive in an unregulated system. These impoundments would, in turn, act as sources of undesirable species within areas containing Special Status or desirable fishes. In addition, impoundments, instream structures, or linear crossings constructed on streams containing populations of fish, invertebrates, or amphibians would in some cases limit movement among required habitats. Where negative effects on habitat quality, quantity, or the life history requirements of fishes resulting from the construction of impoundments, instream structures, and linear crossings cannot be mitigated, fragmentation and impairment of fish habitats would result. Attempts to minimize the impacts of fish barriers and instream structures on fish populations would cause occasional adverse impacts to Special Status or desirable fish populations as a result of habitat alteration, habitat fragmentation, and spread of exotic fishes. Management actions to minimize disturbances to wildlife during sensitive life cycles can be found in Table 2-10 (Seasonal Wildlife Stipulations for all Surface Disturbing Activities).

Surface disturbing and disruptive activities would be prohibited within 164 feet (50 m) of prairie dog towns. This would reduce the chance of burrow collapse and potential prairie dog displacement. Above-ground facilities would not be allowed within 1/4 mile of prairie dog towns, unless equipped with raptor anti-perch devices, and power poles would not be allowed within prairie dog towns. These actions would reduce raptor predation on prairie dogs.

Boat and raft landing areas would not be developed and outfitting camps would be prohibited in western yellow-billed cuckoo habitat. This would reduce disturbance to the cuckoo and its associated habitat. In addition, surface disturbing and disruptive activities would be prohibited within 1/2 mile of identified habitat from April 15–August 15 for the protection of nesting cuckoos. As a result, this would decrease disturbance, increase nesting and nestling survival, and potentially increase the populations into historical ranges.

The area east of state Hwy 789, south of I-80, west of state Hwy 71 and Carbon County Road 401, and north of state Hwy 70 would receive more protection for greater sage-grouse and Columbian sharp-tailed grouse. The nesting and early brood rearing habitat buffer and associated timing stipulations would be extended to 4 miles for sage-grouse and 2 miles for sharp-tailed grouse. Within this area there are 111 known sage-grouse leks (23 percent); 74 out of these 111 (66 percent) leks are within high or moderate oil and gas potential (Map 4-7). Another 23 leks are within 4 miles of high or moderate oil and gas potential. Therefore, 87 percent of the identified sage-grouse nesting and brood rearing habitat within this area would be potentially affected by oil and gas development. There are 17 known sharp-tailed grouse leks, which account for 77 percent of all leks. Eight of these 17 (47 percent) leks are within high or moderate oil and gas potential. Another 2 leks are within 2 miles of high or moderate oil and gas potential. Therefore, 59 percent of the currently identified sharp-tailed grouse nesting and brood rearing habitat within this area would potentially be disturbed by the oil and gas development. The additional protection measures for nesting and breeding sage-grouse extend 4 miles from the lek, and would provide further protection to those birds that nest 2 to 4 miles, as compared to 2 miles, from the lek outside of the area

(east of state Hwy 789, south of I-80, west of state Hwy 71 and Carbon County Road 401, and north of state Hwy 70). For those birds that nest within 2 miles of the lek, the protection measures would be the same as those described in Table 2-1, Alternative 4. This increased protection would reduce disturbance to nesting and strutting birds from oil and gas surface disturbing and disruptive activities.

Additional protection of identified nesting habitat, active grouse leks, and winter concentration areas during critical times would reduce predation and disturbance and increase reproductive success. High-profile structures would be prohibited within 1 mile of active grouse leks reducing avian predation.

Summary

Additional protections would be provided for wildlife and fish species, associated habitats, and sensitive life cycles, which would protect these species during critical time periods throughout the natural life history of each species. Fire and fuels management would decrease suppression activities and allow wildland fire to influence the natural ecological process. Livestock management would meet DPC objectives, which would incorporate consideration of wildlife and fish habitat requirements to enhance viability of fish and wildlife populations. An increase of 1,074,490 acres from Alternative 1 is subject to lease stipulations for resource protection. This would provide increased protection to wildlife and their associated habitat. Vegetation treatments would be more frequent and designed to achieve DPC. Timing restrictions applied to surface disturbing and disruptive activities would protect wildlife species and their habitat. However, permitted activities would result in habitat loss, degradation, and fragmentation within these areas. Over time this would lead to increased competition for forage, reduced carrying capacity, and reduced recruitment.

4.19.5 Impacts Under Alternative 4: Proposed Plan

Air quality, paleontological, socioeconomic, and visual resource management would have little or no impacts to wildlife and fish resources.

Impacts from fire and fuels management, forest management, SD/MAs (except those listed below), transportation and access management and wild horse management would be the same as those described under Alternative 1.

Impacts from cultural resource management would be the same as those described in Alternative 3.

Lands and Realty Management

Impacts associated with lands and realty management would be the same as those described in Alternative 1 with the following exceptions:

Withdrawals of 48,720 fewer acres from the operation of the public land laws, including disposal, would reduce the level of protection to wildlife and fish habitats as compared to Alternative 1.

Land tenure adjustment would consider the disposal of up to approximately 46,230 acres of BLM-administered public lands, which would result in a loss of wildlife or fish habitats from public ownership (Maps 2-26 through 2-29 and Appendix 7).

Livestock Grazing Management

Impacts from range improvement projects (except fence conversions) would be the same as those described under Alternative 1, and the impacts of livestock grazing would be the same as those described

under Alternative 3. Fence conversions would be more actively pursued, but would take into consideration the needs of both wildlife and livestock management. This would reduce stress, energy loss, injury, and mortality to wildlife caused by fences, but would still maintain adequate fence construction in higher pressure areas to control livestock.

Minerals Management

Impacts from minerals management would be the same as those described under Alternative 1, except 46,690 fewer acres would be withdrawn from locatable mineral entry, which would increase the potential for surface disturbing activities and thereby reduce the level of protection to wildlife and fish habitats.

OHV Management

Impacts from OHV management would be similar to the impacts disclosed in alternative 1, with the exception that OHV off-road use to retrieve big game kills and to access camping sites would be restricted to 300 feet off of designated or existing roads and trails. These actions would decrease and localize disturbance to within 300 feet of designated or existing roads and trails and decrease displacement to wildlife and their habitat during critical time periods.

Recreation Resource Management

Impacts from recreation resource management would be the same as those described under Alternative 3, except that the 1/2-mile buffer would be reduced to a 1/4-mile buffer. Management actions under the NSO stipulation would further provide wildlife and habitat protection. In addition, special recreation permits would not be issued for prairie dog hunting. This action would provide protection to prairie dogs, which are a food source for many other wildlife species. Also, the prairie dog is listed as a BLM sensitive species, and requires BLM to manage the species so that it will not be listed as an endangered species in the future.

Special Recreation Management Areas

Management actions of the North Platte River SRMA (5,060 acres) would be the same as those of Alternative 1, except the SRMA would be open to oil and gas leasing with intensive management with an NSO stipulation on new leases and closed to mineral material disposal within 1/4 mile of the river. These actions would reduce disturbance to wildlife and associated habitat.

Impacts from management of the OHV SRMA would be the same as those described in Alternative 2.

Continental Divide National Scenic Trail SRMA, Pedro Mountains SRMA, Jelm Mountain SRMA, Laramie Plains Lakes SRMA, Rawlins Fishing SRMA, and Shirley Mountain SRMA impacts would be the same as under Alternative 3

Special Designations/Management Areas

Wilderness Study Areas

All WSAs would be closed to motorized vehicle traffic (except Ferris Mountain WSA [21,880 acres]), which would eliminate disturbance and stress to wildlife and alteration of habitats.

Wild and Scenic Rivers

The impacts associated with WSRs would be the same as those in Alternative 1, except that only the Encampment River WSR would be managed as suitable for inclusion in the NWSRS.

Other Special Designations/Management Areas

Impacts from management of the Upper Muddy Creek Watershed/Grizzly WHMA would be similar to those under Alternative 1, except management would actively pursue conservation of Colorado River fish fauna and terrestrial wildlife species.

Impacts from management of the Sand Hills ACEC and JO Ranch Expansion area (12,680 acres total) would be the same as those described in Alternative 3.

Impacts from management of the Stratton Sagebrush Steppe Research Area (5,530 acres) would be the same as those described in Alternative 3.

Management of the Cave Creek Cave ACEC (240 acres) would reduce disturbance to wildlife and loss or alteration of their habitat and benefit the cave ecosystem.

Impacts from management of the Laramie Plains Lakes WHMA (1,600 acres) would be the same as those described in Alternative 3.

Impacts from management of the Historic Trails Area (contributing segments within 66,370 acres of federal land) and Blowout Penstemon ACEC (17,050 acres) would be the same as those described in Alternative 3, except these areas would not be closed to locatable mineral entry, which would increase the potential for surface disturbing activities and associated degradation of wildlife habitat.

Vegetation Management

Vegetation management actions would achieve DPC objectives, in addition to meeting rangeland health standards. Emphasis on habitat requirements would increase the suitability of the habitat to enhance wildlife and fish populations. Management for DPC objectives in riparian areas would result in a mixture of herbaceous and multi-aged woody species, which would improve habitats for a diversity of wildlife species. There would be an increase in vegetation acres treated (about 16,400 acres annually). The size of the treatments would be a mixture of landscape-scale and smaller, mosaic pattern applications. This would result in a mixture of seral conditions that would benefit the greatest diversity of wildlife species.

Control of the noxious and invasive species would benefit wildlife habitat by maintaining natural species diversity, cover, structure, and nutritional value. About 25,000 acres would be treated annually to control noxious and invasive weeds, to maintain or improve fish and wildlife habitat.

Water Quality, Watershed, and Soils Management

Impacts from water quality, watershed and soils management would be the same as those described under Alternative 1, except the restriction of water impoundments in the Muddy Creek Watershed (Map 2-20) that result in an annual water loss and/or storage of greater than 1 acre-foot per project would preserve fish habitats by maintaining natural streamflow conditions in Muddy Creek.

The protection afforded the Encampment River Watershed would act to preserve habitats for various fish and wildlife species that use this area.

Wildlife and Fish Management

Impacts associated with wildlife and fish management would be the same as those described in Alternative 1, except for those described below.

Seasonal restrictions for active raptor nests would reflect species-specific breeding and nesting periods. These actions would increase protection for species that fledge outside of the timing stipulations listed in Alternative 1.

Impacts associated with the management of wetland/riparian, including road crossings of waterbodies (Appendix 26), would be the same as those described in Alternative 3.

The placement of power lines within prairie dog towns would be avoided. Raptor perch inhibitors would be installed on the power poles located within or adjacent to an active prairie dog town to reduce avian predation.

Impacts associated with the management of greater sage-grouse would be the same as those described in Alternative 3.

Summary

Fire and fuels management would displace wildlife for the short term, but provide natural disturbance regimes to maintain habitat diversity for the long term. Fence conversions would be more actively pursued, which would reduce stress, energy loss, injury, and mortality to wildlife caused by fences. Increased acreages associated with SD/MAs would increase wildlife habitat. Vegetation management in riparian and wetland areas to meet DPC would potentially result in long-term benefits to wildlife. The use of seasonal and distance restrictions on surface disturbing and disruptive activities would decrease impacts to wildlife species during critical time periods throughout the year, such as breeding and nesting time periods, which is essential to maintain populations in different habitat types.

4.20 CUMULATIVE IMPACTS

Cumulative impacts are the effects on the environment that result from the impact of implementing any one of the alternatives in combination with other actions outside the scope of this plan, either within the RMPPA or outside it. The CEQ regulations for implementing NEPA define cumulative impacts as follows:

> "…the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1500-1508)

The cumulative impact analysis for this RMP FEIS evaluates the potential impacts associated with the Rawlins RMP management alternatives as presented in Chapter 2, in combination with the potential impacts associated with other relevant activities that have occurred, are occurring, or are likely to occur in the vicinity of the RMPPA. The cumulative effects of past and present actions and activities on resources are manifested in the current condition of the resource, which is described in Chapter 3 (Affected Environment) for resources on lands administered by BLM within the RMPPA.

4.20.1 Impact Assessment Methodology

Land use planning is BLM's broadest level of decisionmaking. BLM planning-level decisions are programmatic decisions that tend to be allocations of resources and "zoning" of areas to emphasize certain management direction. Site-specific actions are seldom addressed in an RMP. Consequently, the cumulative impact analysis is also broad and general in nature. It will present ranges and qualitative conclusions as opposed to bounded quantified details. BLM considers these cumulative impacts in subsequent NEPA documents that analyze specific projects or programs. Examples include oil and gas field development plans, allotment management plans, and individual authorizations such as Rights-of-Way or Special Recreation Use Permits.

The cumulative impact analysis is based on numerous assumptions and projections about future actions and their effects. Detailed information about specific future actions may be unavailable. General terms, such as "low," "moderate," and "high," are used to describe the intensity of effects. The cumulative impact analysis also compares the relative intensity of effects between alternatives.

CEQ guidance directs cumulative impact analysis to focus on important issues of national, regional, or local significance. This analysis focuses on the RMP FEIS actions that, when combined with other past, present, and reasonably foreseeable future actions, would collectively be of potential significance. Significance criteria are the same as presented for each resource topic above. Therefore, not all issues identified for direct or indirect impact assessment in this RMP FEIS are analyzed for cumulative effects. Because of the wide geographic scope of a cumulative impact assessment and the variety of activities assessed, cumulative impacts are commonly examined at a more qualitative and less detailed level than are direct and indirect impacts presented previously in this chapter.

Public documents prepared by federal, state, and local government agencies are the primary sources of information regarding past, present, and future actions. Actions undertaken by private persons and entities are assumed to be captured in the information made available by such agencies. Speculative or uncommitted projects are not included in the projections. These projections are not planning decisions. Using them in this analysis does not constitute approval by BLM or any authorizing agency. These

projections do not set a limit or cap on future BLM actions. Unforeseen changes in such factors as economics, public demand, and federal, state, and local laws and policies could result in different outcomes than those projected for this analysis.

The potential cumulative impacts are described for each affected resource within a defined cumulative impact analysis area (CIAA). The CIAA covers different geographic areas, depending on the specific resource being evaluated, and might vary from the ROIs described previously in this chapter. The CIAAs are described in each of the resource sections below. CIAAs that extend beyond the RMPPA are largely for resources that are mobile or migrate compared with resources that are stationary. For example, the air quality CIAA is large because it is based on the complex interaction between climatic factors, terrain, and the potential for significant impacts to occur in sensitive areas within the airshed. Smaller CIAAs were established for resources that are stationary, such as cultural resources, minerals, recreation, and visual resources. In some cases, these CIAAs might be the same as the RMPPA boundary. Activities and development that occur within or outside the CIAAs have the potential to create cumulative impacts to the specific resource being analyzed.

BLM considered the following factors in this cumulative impact assessment:

- Federal, nonfederal, and private actions
- The potential for synergistic effects or synergistic interaction among or between effects
- The potential for effects to cross political and administrative boundaries
- Other spatial and temporal characteristics of each affected resource
- The comparative scale of cumulative impacts across alternatives.

4.20.2 Projects and Activities Considered

The following activities were identified as having the greatest likelihood to generate potential cumulative impacts when added to activities associated with the Rawlins RMP alternatives:

- BLM land management plans and activities in adjacent RMPPAs
- Regional oil and gas development activities (e.g., exploration, production, and pipeline development)
- Regional recreation activities (e.g., big game hunting, OHV use, and dispersed recreation)
- Economic development activities in Albany, Carbon, Laramie, Fremont, and Sweetwater Counties.

Oil and gas development presents the highest likelihood for significant impacts. Table 4-6 lists existing and reasonably foreseeable oil and gas development, along with the number of completed wells and the number of remaining wells that could still be developed for each of the projects. These numbers represent potential development based on the NEPA-approved totals. Table 4-6 only lists completed and potential wells for projects where a decision has been issued. Table 4-6 does not show wells drilled and abandoned. However, it is assumed that a portion of authorized wells would be dry holes and other producing wells would be abandoned over the life of the plan. The reasonably foreseeable development for oil and gas within the RMPPA takes into account past well abandonment rates, as well as new development, in determining the level of surface disturbance anticipated during the life of the plan (USDI, BLM 2004b) (Final Reasonable Foreseeable Development Scenario for Oil and Gas, Rawlins Field Office, Wyoming, January 20, 2004). Other RFAs that would create the potential for cumulative impacts are listed in Table 4-7. The projects listed in these two tables are not presented as an exhaustive list of RFFAs, but every

effort has been made to present a representative list of RFFAs that could contribute to significant cumulative impacts.

Table 4-6. Summary of Oil and Gas Development Projects Previously or Currently Subject to NEPA Analysis in Southwestern Wyoming

Project	Date ROD/DR Signed	Producing Wells	Remaining Wells that Can Still Be Drilled/Produced
Riley Ridge	1/25/84	29	209
Burley	6/7/94	31	1
Jonah II Field	4/27/98	588	0
Pre-LaBarge CAP	N/A	368	0
La Barge Coordinated Activity Plan Area	8/16/91	487	45
Soda Unit	4/12/89	3	18
Castle Creek	10/24/83	8	10
Moxa Arch	3/7/97	947	1,227
Moxa Arch Infill	Pending	0	0
Hickey Mountain	5/13/87	26	50
Road Hollow	9/83	4	6
Fontenelle	8/16/96	1,052	1,141
Stagecoach	9/27/95	9	59
East LaBarge	5/29/92	19	9
Bird Canyon	6/25/93	6	8
Bravo Unit	7/20/95	7	4
Mulligan Draw[1]	9/23/92	17	0
Creston Blue Gap	10/4/94	275	0
Dripping Rock/Cedar Break[1]	4/3/85	24	0
Sierra Madre	9/21/87	38	8
Hay Reservoir	6/24/92	28	0
Hay Reservoir CBNG		8	0
Jack Morrow Hills CAP	7/19/06	46	271
Continental Divide/Wamsutter II	5/24/00	1,256	874
Continental Divide/Creston	Pending	0	0
Pre-Anticline EIS	N/A	16	0
Pinedale Anticline	7/27/00	540	160
Jonah/McMurry Prospect (larger boundary)	8/3/94	55	0
South Baggs	8/8/00	14	36

Project	Date ROD/DR Signed	Producing Wells	Remaining Wells that Can Still Be Drilled/Produced
Bitter Creek Shallow Gas Project Area	6/24/05	53	61
Pacific Rim Shallow Gas	9/1/04	unknown	150
Vermillion Basin	8/15/02	0	56
Jonah Infill	3/14/06	73	3,027
Desolation Flats	7/27/04	42	343
South Piney	Pending	0	0
Lower Bush Creek	8/22/03	0	22
Seminoe Road	Pending	0	0
Atlantic Rim	Pending	0	0
Atlantic Rim Coalbed Natural Gas Exploration Pods	Various	115	75
Monell Enhanced Oil Recovery	3/2/06	146	126
Wolverine/Shell	5/21/01	0	3
Little Monument	1/9/04	139	31
Pinedale Anticline SEIS	Pending	0	0
Hiawatha Regional Energy Project	Pending	0	0
Beaver Creek CBNG	Pending	0	0
Total	**–**	**6,469**	**8,030**

[1]Superseded by the Desolation Flats project

Note: The various projects included in Table 4-6 as "pending" are projects that have not been included in the reasonably foreseeable future oil and gas projects because no decision has been issued. Initial well proposals for the pending projects is estimated to be 22,800 wells as of the date of publication of this RMP FEIS.

Table 4-7. Summary of Past, Present, and Reasonably Foreseeable Actions

Title	Description
Carbon Basin Coal Lease	Projected surface mine life of 11 years with a production rate of initially 1.3 million tons per year reaching a maximum of 3.1 million tons per year with total reserves of 31.1 million tons. Underground mine life would occur simultaneously with surface mining lasting for about 17 years, with an average reasonably foreseeable production of approximately 5.6 million tons/per year. Total underground mining production would be 112 million tons. Projected reasonably foreseeable surface disturbance would be 288 acres per year, for a total of 4896 acres of surface disturbance throughout the life of mine.
Bridger Coal Company, Coal Lease-by-Application	Conversion of surface mining operations to underground mining to extend the life of the mine.

Title	Description
Hay Reservoir Geophysical Project	The south boundary of the proposed project lies about 20 miles north of I-80. It extends northward past Hay Reservoir and ends 3 miles north of Five Fingers Butte. About 55% of the project area would lie within the BLM Rock Springs Field Office RMPPA, and 45% of the project would lie in the RMPPA.
Monell CO_2 Pipeline Project	Proposed CO_2 pipeline and related facilities along an existing pipeline from the Exxon/Mobil Shute Creek CO_2 pipeline system in Sweetwater County, Wyoming, to the existing Monell Federal Unit. Proposed facilities include metering equipment, a booster station, and cathodic protection.
Jim Bridger Flue Pond Expansion Project	Project is completed.
Quantum Geophysical Project	Project is completed.
Haystacks Geophysical Project	Geophysical operations in the Haystacks area. The project has been completed, with the exception of minor cleanup planned for Spring of 2004.
Hatfield 3D seismic survey	3D seismic survey of Hatfield Dome, Carbon County
Cherokee West 3D seismic survey	3D seismic survey for Sweetwater County, Wyoming, and Moffat County, Colorado
Pioneer Pipeline Right-of-Way	Pioneer Pipeline has built a 12- to 16-inch refined petroleum pipeline across federal lands in southwest Wyoming. The pipeline extends from Sinclair, Wyoming, west to an existing block valve in Croydon, Utah.
Grizzly and Chain Lakes WHMA Fence Modification (WGFD)	Fence modifications
Daley and Chain Lakes WHMA Fence Construction (WGFD)	Fence construction
Vegetation Treatments (WGFD)	Use of prescribed fire on private and state lands for the benefit of wildlife
Seminoe and Ferris Mountain Area Wildlife Transplant (WGFD)	Transplant of bighorn sheep to Seminoe and Ferris Mountain areas.
Livestock Grazing Management (WGFD)	Alteration of existing grazing strategies on state and private lands
“AccessYes” Walk In Areas and Hunter Management Areas (WGFD)	Private acreage listed under the Walk-In program is increasing and often provides access to enclosed BLM lands as well as the private lands that are enrolled in the program.
Habitat Extension Services (WGFD)	Habitat treatments on private lands to benefit wildlife
Moffat County, Colorado, Integrated Weed Management Program	Moffat County partners with public land managers as well as private landowners to control weeds.
Native Fish Restoration (WGFD)	Restore native fish to traditional waterways on private, state, or WGFD lands
Little Snake River Water Quality (LSFO)	Monitoring and evaluation of the Little Snake River in Colorado
Muddy Creek Water Storage Reservoirs (LSRCD)	Construction of five reservoirs ranging in size from 150–2500 acre/foot capacity on private, state, and federal lands to provide water for stock and wildlife, wetlands, instream flows, irrigation, recreation, municipal, and other industrial uses in the Upper Colorado River Basin
Wetlands Development and Expansion (LSRCD)	Enhance existing wetlands with flow augmentation and expand/create an additional 400 surface acres of wetland habitat on private, state, and federal lands in the Little Snake River Basin

Title	Description
Stock Water Developments (LSRCD)	Construct and reestablish 25 stock and wildlife water sources, including ponds, pits, pipelines, wells, and troughs in Little Snake River Watershed on federal lands.
Rangeland Enhancements, Improvement, Treatments (LSRCD)	Improve grazing practices and install range improvements and habitat treatments in the Little Snake River Watershed to increase available forage, nesting habitat, and increase carrying capacity for both wildlife and livestock on private, state, and federal lands.
Savery Creek Fisheries Enhancement (LSRCD/NRCS)	Fisheries habitat improvements and fish passage on 14-mile reach of Savery Creek on federal, state, and private lands
Battle Creek Fisheries Enhancement (LSRCD/NRCS)	Fisheries habitat improvement on Battle Creek on private lands
Vegetation Management (LSRCD)	Treat fire-dependent and decadent plant communities to increase species diversity and vigor and create mosaic of serial classes on state and private lands.
Ranching for Wildlife Colorado Division of Wildlife Public/Private Wildlife Partnership	Under the program, participating ranches are given flexibility in season timing, length, and take restrictions, in exchange for permitting public access to high-quality hunting opportunities and managing their habitat to enhance wildlife.
Sage-Grouse Conservation Plans	Wyoming Game and Fish Department and Colorado Division of Wildlife prepared plans for recovery of the greater sage-grouse.
Wildlife Migration (LSFO)	Antelope and elk herd migration from Colorado to Wyoming, especially during severe weather. Exchange and movement of herds are anticipated. Possible influx of chronic wasting disease in elk herds into Wyoming.
Entrega Pipeline Project	Proposed pipeline would run from the Piceance Basin in Colorado to Wamsutter, Wyoming (that portion of pipeline would be 36” in diameter). From Wamsutter, it would parallel Interstate 80 east toward Cheyenne before heading south to the Cheyenne Hub near Rockport, Colorado (that portion of pipeline would be 42” in diameter). Total length of pipeline would be 327 miles. An Environmental Impact Statement is being prepared for the project.
Wyoming Interstate Company Pipeline	Proposed pipeline would run from the Roan Cliffs Meter Station in Colorado to Wamsutter, Wyoming. The proposed pipeline will be 24" in diameter and will follow an existing CIG pipeline.
Hiawatha Field Pipeline	Natural gas pipeline from the Hiawatha Field in northern Colorado to Wyoming
Overland NGL Pipeline	NGL pipeline from Opal, Wyoming, to Kansas
Enbridge Crude Oil Pipeline	Pipeline carrying Canadian crude oil through Wyoming to Salt Lake City, Utah
Kanda Pipeline	Natural gas pipeline from Utah to Wyoming
BLM Platte River RMP (1985) and Casper RMP Revision (Casper RMP DEIS Released 7/06)	Comprehensive land use plan focuses on similar resource issues and management to the north of the Rawlins RMPPA. Casper RMP manages portions of the Rawlins RMPPA CIAAs for air, watershed, and wildlife.
Lander RMP (1987)	Comprehensive land use plan focuses on similar resource issues and management to the north of the Rawlins RMPPA. Lander RMP manages portions of the Rawlins RMPPA CIAAs for air, watershed, wildlife, and wild horses.

Title	Description
Green River RMP (1997)	Comprehensive land use plan focuses on similar resource issues and management to the west of the Rawlins RMPPA. Green River RMP manages portions of the Rawlins RMPPA CIAAs for air, watershed, wildlife, wild horses, and socioeconomics.
Little Snake RMP (1989) and Little Snake RMP Revision	Comprehensive land use plan focuses on similar resource issues and management to the south of the Rawlins RMPPA. Little Snake RMP manages portions of the Rawlins RMPPA CIAAs for air, watershed, wildlife, and wild horses.
Royal Gorge	Comprehensive land use plan focuses on similar resource issues and management to the south of the Rawlins RMPPA. Royal Gorge RMP manages portions of the Rawlins RMPPA CIAAs for air, watershed, and wildlife.
County-wide transportation development	Planning, development, reconstruction, and maintenance of county road net in four counties within the RMPPA
Medicine Bow National Forest Land and Resource Management Plan (USFS)	16.3 miles of WSR designation on North Platte River within National Forest; 11.3 miles of WSR designation on portions of the Encampment River within National Forest. Recommends 27,963 acres for wilderness designation within Huston Park and Encampment River Wilderness Areas; Rock Creek area. 18,708 acres of designated Special Interest Areas (Ashenfelder, Cinnabar Park, Medicine Bow Peak, White Rock Canyon, Kettle Ponds, Tramway Train, Roper Cabin, Douglas Creek Tie Dam, Horse Creek Tie Dam, Muddy Park Tie Dam, Sunken Gardens, Centennial Ridge, and Ribbon Forest). 15,476 acres of Research Natural Areas (Platte Canyon, Battle Mountain, Savage Run, LaBonte Canyon, and Brown's Peak [Snowy Range]). 265,298 acres available for oil and gas leasing, with lease stipulations that vary from standard stipulations to No Surface Occupancy. Snowy Range RNA withdrawn from mineral entry. Potential timber resource outputs of 22.8 MMBF per year Allowable Sale Quantity (ASQ). Clear-cutting determined to be optimum method for regenerating lodgepole pine, and openings will vary in size from less than 40 acres to 250 acres. 286,266 acres available for semiprimitive nonmotorized recreation and 223,056 acres available for semiprimitive motorized recreation. The addition of 1,364 acres of potential ski area expansion for Snowy Range Ski Area (no current proposals to expand; if a proposal submitted it will go through site-specific analysis).
Savery Oil Field (USFS and Carbon County)	Oil field on private land west of Sierra Madres
Ferris Haggerty Mine Reclamation (USFS)	Mine reclamation on private land north of the Sierra Madres. This is a State of Wyoming Department of Environmental Quality project funded under the Abandoned Mine Lands program.
Sage Creek Road (Rawlins to Battle) (USFS)	Road paving operation.
Green Mountain Ski Area (USFS)	Proposed ski area on private land near the Sierra Madre Mountain Range.
Two Elks Power Plant (USFS)	Power plant proposed on private land in Campbell County south of the Powder River Basin.
Jonah Cryo Plant	Cryo Plant at terminus of Jonah gas gathering system
Wind Energy Development	Scattered throughout the RMPPA, there is a potential for large and frequent wind development projects to occur.

Title	Description
USFWS National Wildlife Refuges	A Comprehensive Conservation Plan for the Arapaho National Wildlife Refuge complex satellites (Bamforth, Hutton Lake, Mortenson Lake, and Pathfinder National Wildlife Refuges) will be prepared starting in 2005.
BLM Wild Horse Gathers	BLM wild horse gathers from HMAs in adjacent BLM offices

4.20.3 Impacts by Resource

Air Resources

The potential impacts from the air emissions described in Section 4.2 are analyzed based on the ROI that includes nearby air quality sensitive areas, such as national parks and wilderness areas. More details on regional areas of consideration and the specific locations of areas outside the RMPPA that were addressed are found in the Air Quality Technical Support Document (Appendix 4).

The CIAA used to access cumulative impacts on air quality is the same as the ROI mentioned above. Sources of potential cumulative impacts to air quality would include emissions from coalbed natural gas and conventional oil and gas development on existing and new leases within and outside the RMPPA. Wildland fires and prescribed burns that occur within the CIAA could result in impacts to air quality from emissions of particulates and polyaromatic hydrocarbons (PAH). Impacts from wildland fires would also result in reduced visibility. Vehicular activity would also produce emissions that could impact air quality, primarily along the I-80 corridor.

Permitted stationary sources of air emissions would also continue to contribute to potential cumulative impacts to regional air quality. The Wyoming Statewide Emission Inventory conducted by TRC-Mariah indicates that there will be an increase of future emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$ in the RMPPA and for the State of Wyoming. The Wyoming statewide RFD emissions increases were calculated by subtracting the state-permitted emissions through June 30, 2003, from all NEPA-authorized and other quantifiable emissions from June 30, 2004. The RMPPA emissions are 2003 base year emissions subtracted from 2023 emissions. Potential emissions increases are summarized in Table 4-8. (For further details, refer to Appendix 4).

Table 4-8. Summary of Emission Increases as Estimated by the Wyoming Statewide Emission Inventory and BLM Emission Inventory

Air Pollutant	Emissions (tons per year)					
	Wyoming Statewide RFD[1]		BLM Sources[2]			
			RMPPA Alternative			
	Wyoming	RMPPA	1	2	3	4
NO_x	5,726	1,279	6,932	7,433	5,046	6,500
SO_2	115	<0.1	64	69	40	53
PM_{10}	741	<0.1	1,047	1,132	699	934
$PM_{2.5}$	195	<0.1	397	429	275	368

1 RFD emission differences calculated by subtracting permitted emissions from authorized NEPA and other quantifiable emissions after June 30, 2003

2 Emission differences calculated by subtracting base year (2003) RMPPA emissions from year 2023 RMPPA emissions (Table A4-5 through Table A4-7 in the AQTSD, Appendix 4)

Particulate emissions estimated for the RMPPA (Table A4-5 through Table A4-7 in Appendix 4) are much higher than the Wyoming statewide RFD case, but this is expected because many of the particulate sources (for example, construction) do not require an air permit and would not be counted in the Wyoming statewide RFD case, which takes into account the subtraction of NEPA and other quantifiable emissions from permitted emissions.

Ambient air monitoring data show low concentrations for criteria pollutants (except ozone) in the area (Chapter 3). Taking into account the emission information estimated for this analysis and project-specific air quality analyses conducted in the area, such as Desolation Flats and Atlantic Rim, BLM concludes that increases in concentrations of carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) in the RMPPA would be unlikely to cause any exceedence of federal or state ambient air quality standards.

Because a quantitative relationship between expected air emissions calculated above and the subsequent potential cumulative impacts to ozone and the air quality values of visibility and atmospheric deposition are not known, it is not possible to quantify potential impacts to these air quality values from the sources in the ROI. These cannot be quantified because of the complex nature of the formation of ozone, the complexity of visibility impairment, and atmospheric deposition in the atmosphere.

However, because air quality analyses from recent energy development projects, such as those at Desolation Flats (USDI, BLM 2003b) and Atlantic Rim (USDI, BLM 2006), estimate potential impacts to visibility, emissions described in Section 4.2 might contribute to significant impacts to visibility (Table 4-9 and Table 4-10). The sources modeled for Desolation Flats and Atlantic Rim have some similarities to the Rawlins RMPPA analysis.

Table 4-9. Summary of Far-Field Air Quality Impacts from the Desolation Flats EIS

Air Quality Component	Comment
Potential Air Pollutant Concentrations	
Criteria Air Pollutants	• Far-Field total concentrations are in compliance with applicable NAAQS and WAAQS – Particulate matter concentrations 13–40% of standards – NO_2 concentration 10% of standard – SO_2 concentrations 4–8% of standards • Far-Field project concentrations are well below applicable PSD Class I increments[a] – PM_{10} concentrations .002-.4% of increments – NO_2 concentration .4% of increments – SO_2 concentration .005–.07% of increments

Air Quality Component	Comment
Visibility	
Days with > 1.0 ΔdV	• Potential visibility impacts from the Desolation Flats project were less than the FLAG visibility threshold • Potential cumulative visibility impacts were greater than the FLAG visibility threshold – 7 days in Bridger Wilderness – 2 days in Fitzpatrick Wilderness – 0 days in Popo Agie Wilderness – 1 day in Wind River Roadless Area – 0–1 day in Dinosaur National Monument – 1 day in Savage Run Wilderness – 1 day in Mount Zirkel Wilderness – 0–1 day in Rawah Wilderness
Atmospheric Deposition	
Lake Chemistry Level of Acceptable Change (LAC)	• Decreases in ANC from the Desolation Flats project alone were less than the lake chemistry LAC (level of acceptable change) • Cumulative decreases in ANC were less than the lake chemistry LAC for sensitive lakes – 6% of LAC for Black Joe Lake – 7% of LAC for Deep Lake – 3% of LAC for Hobbs Lake – 2% of LAC for Ross Lake – 9% of LAC for Lower Saddlebag Lake – 13% of LAC for Seven Lake – 22% of LAC for West Glacier Lake – 5% of LAC for Island Lake – 9% of LAC for Rawah #4 Lake • Cumulative decreases in ANC were less than the lake chemistry LAC for sensitive lakes – 46% of LAC for Upper Frozen Lake – 32% of LAC for Pothole A-8 – 32% of LAC for Upper Slide Lake

[a] Comparisons with PSD Class I Increments are intended only to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis

Table 4-10. Summary of Far-Field Air Quality Impacts from the Atlantic Rim EIS

Air Quality Component	Comment
Potential Air Pollutant Concentrations	
Criteria Air Pollutants	• Far-Field total concentrations are in compliance with applicable NAAQS and WAAQS – NO_2 concentration 15% of standard – Particulate matter concentrations 31–39% of standards – SO_2 concentrations 12–20% of standards
Visibility	
Days with > 1.0 ΔdV	• Potential visibility impacts from the project were less than the FLAG visibility threshold • Potential cumulative visibility impacts were greater than the FLAG visibility threshold – 1 day in Bridger Wilderness – 1 day in Popo Agie Wilderness

Air Quality Component	Comment
Days with > .5 ΔdV	• Potential visibility impacts from the project were less than the USFS/National Park Service (NPS) visibility threshold • Potential cumulative visibility impacts were greater than the USFS/NPS visibility threshold – 8 days in Bridger Wilderness – 1 days in Fitzpatrick Wilderness – 3 days in Popo Agie Wilderness – 8 days in Wind River Roadless Area – 4 days in Dinosaur National Monument
Atmospheric Deposition	
Lake Chemistry Level of Acceptable Change (LAC)	• Cumulative decreases in ANC were less than the lake chemistry LAC (Level of Acceptable Change)
Nitrogen Deposition Level of Concern [a]	• Increases in nitrogen deposition from the project alone were less than the nitrogen deposition DAT (Deposition Analysis Threshold) • Cumulative increase in nitrogen deposition were less than the nitrogen deposition LOC (Level of Concern)
Sulfur Deposition Level of Concern	• Increases in sulfur deposition from the project alone were less than the sulfur deposition DAT (Deposition Analysis Threshold) • Cumulative increase in sulfur deposition were less than the sulfur deposition LOC (Level of Concern)

[a] The USFS and NPS are concerned the nitrogen deposition LOC is set too high to adequately protect terrestrial ecosystems from deposition impacts, and are currently considering a new nitrogen deposition LOC.

It would be inappropriate to infer RMPPA impacts directly from impacts estimated for the Desolation Flats or Atlantic Rim projects as a result of differences in such components as emission inventories. However, results of the quantitative analyses using modeling performed for these projects suggest that RMPPA activities could contribute to significant impacts to visibility in Bridger, Fitzpatrick, Mount Zirkel, and Rawah Wilderness Areas.

Because monitoring of total nitrogen deposition in the Snowy Range shows deposition loading above the USFS voluntary level-of-concern (Figure 3-27), emissions described in Section 4.2 might contribute to significant impacts to total nitrogen deposition. BLM plans to make quantitative estimates of these impacts for project-specific EISs.

Recent regulatory monitoring of ozone concentrations near natural gas development in the Upper Green River Basin recorded elevated ozone levels during the winter months. It should be noted that, to date, there is no finding of an ozone air quality standard violation at the monitoring sites in the Upper Green River Basin.

BLM has chosen to describe potential air quality impacts in the Rawlins Resource Management Plan qualitatively. In the near future (2007), BLM plans to analyze RMP cumulative far-field air quality impacts quantitatively with screening dispersion modeling. This would be part of a statewide analysis BLM refers to as the “State of the Atmosphere” study.

This State of the Atmosphere will provide an annual summary of potential cumulative far-field impacts to criteria air pollutant concentrations, Class I visibility, and atmospheric deposition throughout the State of Wyoming. BLM plans to rely on dispersion model results from the State of the Atmosphere, as well as air

quality monitoring and project EIS modeling results, to describe potential cumulative far-field air quality impacts in future BLM Resource Management Plans.

Cultural

The cultural resource CIAA consists of the RMPPA and the adjacent lands where the setting of historic properties within the RMPPA extends outside of the field office boundary. This CIAA was identified because BLM is not only required to manage the physical remains of historic properties, but is also the setting where it is an important aspect of integrity of the property (Appendix 5). Impacts to cultural resources within the RMPPA from management actions identified in Table 2-1 are presented in Section 4.3 above.

Development activities occurring on private and state lands with no federal jurisdiction would have the greatest cumulative impact on cultural resources within the RMPPA. A large portion of the minerals activities analyzed above would occur on private and state lands, especially within the checkerboard landownership areas. These surface disturbing activities result in the damage or loss of cultural resources by removing or altering the context of these sites, thereby limiting the potential to extrapolate the data they have to offer. Minimal cumulative effects to cultural resources are anticipated from activities on other federal lands, as all federal agencies are required to manage cultural resources by the National Historic Preservation Act.

Development activities occurring on private and state lands with no federal jurisdiction would also have the greatest potential for cumulative effects to the setting of cultural properties where the setting is an important aspect of integrity. Disturbance areas and facilities constructed on lands outside federal jurisdiction would alter the landscape surrounding these sites to the point that the integrity of the setting would no longer contribute to the eligibility of the site. The incremental damage and loss of integrity would result in the fragmentation of larger sites and would destroy the values that make these resources significant. Large scale and high-profile developments such as wind turbines and communication towers would also impact the integrity of setting.

Under all of the alternatives, impacts to cultural resources would be avoided or mitigated by cultural resources management program actions and implementation of federal regulatory laws, actions, and guidelines designated to protect cultural resources. The greatest potential for impacts to cultural resources would occur under Alternative 2 because of increased surface disturbance activities and limited protection to cultural resources as a result of a decrease in restrictions from other programs. However, because of increased surface disturbance more acreage would be inventoried, potentially identifying cultural resources before development. The potential for impacts to cultural resources would be less under Alternative 3 because of increased restrictions placed on surface disturbance; however, less acreage would be inventoried than under any other alternative.

Wildland Fire and Fuels Management

The CIAA used to analyze cumulative impacts regarding fire management is limited to the RMPPA. As a result of noncontinuous fuels, moderate historic fire incidence, and significant fuel breaks (e.g., highways, rivers, and county roads), fire management activities within the RMPPA would be specific to the area and would not be significantly influenced by activities occurring outside the RMPPA. Effects to fire management within the RMPPA are presented in Section 4.4 above.

Cumulative impacts on wildland fire management would result from BLM actions when combined with actions on private, state, and other federal lands (Table 4-7). As mineral and urban development increases on both federal and private and state lands throughout the RMPPA, so does the potential for wildland fire

occurrence and the need for fire suppression activities. Wildland fire suppression and hazardous fuel reduction planning, coordination, and cooperation with adjacent rural, state, and other federal agency fire departments would continue in order to optimize fire suppression and fire use activities on all land ownerships.

The increased mineral development and associated infrastructure (e.g., wells, pipelines, power lines, compressors, fuel tanks, etc.) on both federal and nonfederal lands within the RMPPA increases the complexity of fire and fuels management activities. In addition to the requirement to protect structures and facilities within WUI areas through wildland fire suppression, the landownership pattern and presence of facilities influences when and how vegetative treatments and the use of wildland fire for resource benefit would occur. The increased human activity, increased infrastructure, and rural housing development also limit the opportunity to reintroduce wildland fire into fire-dependent ecosystems.

With the increase in development, human activity, and rural housing also comes a proliferation of weed populations on all ownerships which effect fire behavior, size, and intensity. The suppression of wildland fire to protect both life and property leads to dominance of older vegetative seral stages which complicates efforts to restore rangelands to a younger vegetative mosaic.

Cumulative impacts on fire management are not expected to be significant under any alternative. However, cumulative impacts would be greatest under Alternative 2 because of anticipated increases in development activities and access. Under Alternative 3, restrictions on development and access would reduce the potential for human-caused wildland fires, thereby minimizing potential cumulative impacts on fire management.

Forest Management

The CIAA used to analyze cumulative impacts regarding forest management includes the entire 196,934 acres of forested land (of which 28,500 acres, or about 14.48 percent, are commercial forest areas) within the RMPPA, as well as some forest fringes of USFS forest lands within and/or intersecting the RMPPA (Forest Management Map 3-1). Impacts to forest management on public lands administered by BLM are presented in Section 4.5 above. Because fluid mineral development would take place mostly outside forest areas, cumulative impacts would be minimal. However, woodland forest communities occur in areas that have a higher potential for oil and gas development, thus creating the potential for impacts in these areas.

Most forms of mineral development are predominately located in non-forested to lightly forested areas of the RMPPA and should have minimal to no impact on forest management activities. Developmental impacts on forested lands from minerals management on federal and adjacent nonfederal lands would occur from the removal of forest floor and stand vegetation for roads and other surface infrastructure. Such activities would potentially result in lands being removed from potential timber harvest production for the life of the development (Table 4-6 and Table 4-7). These impacts would be similar for leaseable, locatable, and Common variety minerals as well. However, mineral resource development activity that would occur in forested areas would potentially benefit forest management by providing opportunities for increased accessibility to potential harvest or treatment areas from newly created roads into forested areas that currently have no road access.

Potential impacts to forest management would result primarily from surface disturbing and disruptive forestry-related activities that would occur on adjacent nonfederal administered lands. Forest management actions would be influenced on BLM-administered lands as a result of timber harvest and/or treatment actions done on adjacent nonfederal lands. This would influence whether forest product harvests or treatments would occur on BLM lands. In areas where adjacent nonfederal landowners have done

significant forest product harvesting, BLM would be limited in the types of forest management actions that would be implemented on BLM-administered lands adjacent to these areas in an effort to protect other multiple use resource values. However, in some localized areas, forest management-related actions done on nonfederal adjacent lands, when combined with forest management actions implemented on BLM-administered lands, would have a positive impact on the overall forest landscape in those localized areas.

The actions and activities considered do not create substantive reductions in overall forest health values or substantially reduce the ability to harvest timber or minor wood products. Under all alternatives, impacts to forest management from the management actions of other resources would not be considered significant. However, varying degrees of disturbance would occur, depending on the level of development projected for each resource under each alternative. Therefore, no significant cumulative impacts would be anticipated under any alternatives, and there would be no substantial difference in the intensity of cumulative effects across alternatives.

Lands and Realty

The CIAA for lands and realty management consists of the entire RMPPA. Impacts to lands and realty management on public lands administered by BLM are presented in Section 4.6 above.

Impacts to lands and realty would result from actions that limit community expansion opportunities and actions that affect the ability to site utility and transportation systems within the RMPPA. These actions are primarily the result of land use restrictions (e.g., VRM designations, sensitive resources, cultural protection, and water and soils resources) and the amount of land that is considered to be withdrawn from public land law and/or locatable mineral entry. Each action would limit or restrict where ROW or other realty actions would be permitted.

Oil and gas development and other surface disturbing and disruptive activities, such as the construction of power and pipelines, communication sites, wind energy projects, and improvements of roads and highways, would cause the greatest amount of cumulative effects to lands and realty management by increasing the demand for ROW authorizations.

Under Alternative 2, minimal cumulative impacts to lands and realty would occur because of negligible alignment restrictions. Fewer restrictions for the protection of sensitive resources within the RMPPA would also occur under Alternative 2 for ROW development (e.g., pipelines, power lines). It is anticipated that public access and use within the RMPPA would increase under Alternative 2 because of increased development. Under Alternative 3, cumulative impacts to lands and realty would be greatest because of increased restrictions placed on sensitive resources and reduced amounts of potential development. The greatest impacts to lands and realty would be in areas managed as NSO areas and listed as avoidance or exclusion areas for ROWs. Under Alternative 4, cumulative impacts to lands and realty would be reduced from cumulative impacts in Alternative 2 in the capability to site ROWs and facilities, except that the type, location, route, height, and color of ROWs and facilities in more areas would be influenced by BMPs, mitigation measures, etc., to protect various sensitive resources and special areas.

Livestock Grazing

The CIAA used to analyze cumulative impacts to livestock grazing includes all allotments occurring either entirely or partially within the RMPPA (Map 3-3). Livestock is managed within the boundaries of these allotments and therefore could be affected by activities occurring in these areas. Effects from BLM actions on livestock grazing operations administered by BLM within the RMPPA are presented in Section

4.7 above, and to a large extent already incorporate private and state lands because livestock allotments usually have intermixed land ownership.

BLM management actions, in addition to activities on other federal, state, and private lands, would primarily affect livestock grazing operations through a combination of activities and land uses occurring within the CIAA. Such impacts would result primarily from surface disturbing and disruptive activities, OHV use, and competition with grazing wildlife and wild horses. These activities result in livestock disturbance, displacement, and/or mortality, and direct removal and indirect degradation of forage. Reclamation efforts and vegetation treatments would reduce forage loss from these activities and land uses to livestock grazing; however, roads, wells pads, and the presence of humans, wildlife, and wild horses would result in long-term and/or permanent impacts.

Existing and future oil and gas development projects, recreation use, livestock, wild horses, and big game populations located within the CIAA would cause a cumulative increase in soil disturbance, vegetation removal, noxious and invasive weed proliferation, livestock displacement, and reduction in available forage. Impacts would be greatest in areas with concentrated mineral development, which would result in substantial rangeland degradation and thereby jeopardize maintaining or fulfilling the Standards for Healthy Rangelands (USDI, BLM 1997) on some allotments. The differences in the projected amount of minerals-related surface disturbance among the RMP alternatives (about 7,160 acres which include private and state lands) would not affect the overall analysis of cumulative effects on livestock management within the CIAA.

Oil and gas development activities and related construction of roads, pipelines, and well pads would be the primary cause of direct forage removal and weed proliferation. Dust is carried in the wind from 1/4 mile to several miles, coating the vegetation and reducing growth rates, palatability, and use patterns by livestock. Impacts to forage resources and, subsequently, livestock operators, would be more severe in the western portion of the CIAA where development is more intense. The implementation of BLM's Mitigation Guidelines, restrictions on surface use, continued implementation of Standards for Healthy Rangelands (USDI, BLM 1997), vegetation treatments, and monitoring efforts would provide protection to forage resources on federal lands and lands with federal subsurface minerals, which would help reduce overall effects to livestock grazing operations. However, lack of requirements for road building criteria, reclamation, and weed control on private and state lands would promote increased erosion, desertification, loss of vegetation cover and production, and proliferation of weeds which, in time, would also affect adjacent public lands and lead to the decline in vegetation health, cover, and diversity.

OHV use is generally not managed on private and state lands, leading to soil erosion and weeds proliferation onto adjacent to public lands. This use also results in cut fences, open gates, and damage to water facilities that increase management complexity.

Competition for forage, water, and space occurs in areas where livestock use overlaps with big game and wild horses. When wildlife or wild horses concentrate in specific locations, livestock management would potentially be modified to minimize negative impacts to vegetation. In addition, both big game and wild horses cause damage to fences that livestock operations have responsibility to maintain, thereby increasing costs of management.

Under Alternative 1, surface disturbing and other uses combined with minimal efforts to control noxious and invasive weeds would result in a loss of AUMs. Under Alternative 2, the increased use of vegetation and weed treatments would help to offset impacts from surface disturbing and disruptive activities and other uses. In addition, the reduction and elimination of wildlife mitigation measures regarding range improvements would increase the flexibility in livestock management under Alternative 2. Eliminating predator control measures and increasing the number of wild horses in the Lost Creek HMA under

Alternative 3 would result in a loss of AUMs, and eliminating new fences in big game migration corridors and prohibiting new water sources in big game crucial winter range would reduce livestock management flexibility. Under Alternative 4, the increased use of vegetation and weed treatments would help to offset impacts from surface disturbing and disruptive activities and other uses. Increasing the number of wild horses in the Lost Creek HMA would result in a loss of AUMs.

Minerals Management

The CIAA for minerals management is composed of the RMPPA area because activities and resources occurring outside of the RMPPA are not expected to affect mineral resource activities within the RMPPA area. Effects to mineral management on public lands administered by BLM within the RMPPA are described above in Section 4.8. Also, the RFD for the RMPPA includes wells for both private and state mineral lands.

Overall, impacts to mineral development from RMP alternatives would occur from surface use restrictions (closure or withdrawals, NSO, controlled surface use, and seasonal restrictions) that would decrease the number of oil and gas wells drilled during the planning period, withdraw lands from locatable mineral entry, and close areas to Common variety minerals development. Because mineral resources are not evenly distributed across the RMPPA, localities where finite mineral resources and other natural resource values are co-located could prevent the minerals from being produced and utilized.

As detailed in Table 1-1, about 1,011,230 acres of federal mineral estate would not be covered by RMP decisions as a result of management of the land surface by other federal agencies such as the USFS, BOR, and USFWS. These agencies dictate the land surface planning and management decisions for these lands, and BLM manages the federal mineral estate in coordination with these agencies on a case-by-case basis. The largest area within the RMPPA containing other federal surface ownership and BLM-administered federal mineral estate is the Medicine Bow National Forest, of which the majority is located in the south-central portion of the RMPPA. Those portions of the Medicine Bow National Forest within the RMPPA comprise about 970,990 acres. In its 2003 Medicine Bow Revised Land and Resource Management Plan, the USFS made 265,298 acres (27 percent) of the forest available for oil and gas leasing and indicated that the remaining 705,692 acres are either designated wilderness, or have no known oil and gas potential. Surface use restrictions on lands available for lease within the forest include NSO, controlled surface use, and timing limitations similar to those of BLM, and would potentially delay and/or preclude development in affected areas similar to impacts described in the Chapter 4 impact analysis section for minerals. Although these restrictions are in place on 27 percent of the forest, and the remainder of USFS lands is designated as wilderness, cumulative effects on oil and gas exploration and development are expected to be minimal because the majority of the land within the USFS boundaries has low to no oil and gas potential. The potential for locatable and salable mineral resource occurrences in the forest area have not been assessed.

No other current RFAs have been identified for other federal surface ownership lands; however, the USFWS will be revising its Comprehensive Conservation Plan for the Arapaho National Wildlife Refuge complex satellites (Bamforth, Hutton Lake, Mortenson Lake, and Pathfinder National Wildlife Refuges) starting in 2005. Consequently, cumulative effects to mineral resources or development in this area would be unknown until a resource assessment is completed

Cumulative effects to nonfederal mineral resources or development would be comparable to effects that occur on federal lands where similar resources are present. Nonfederal wells are addressed in the RFD for the RMPPA and would be held to similar standards as wells located on BLM-administered public lands.

The evaluation of cumulative impacts on mineral development activity includes consideration of the relative changes in the level of mineral resource development among the various alternatives in the RMPPA, given the consideration of other RFAs. When combined with projects and activities in surrounding areas, oil and gas development is expected to continue under all RMPPA alternatives, with Alternative 2 having the greatest number of wells drilled during the planning period and Alternative 3 having the least because of restrictions for protection of sensitive resources.

When current and planned projects in surrounding areas are combined with RMP actions under any alternative, the cumulative effects are not expected to cause a reduction in the development of locatable or Common variety minerals. Locatable mineral activity, with the possible exception of uranium exploration activity, oil shale exploration activity, and coal development activities in Carbon Basin, are expected to be minimal over the next 20 years. Salable mineral development is expected to follow the pace of oil and gas development and urban expansion. The available supply is expected to keep pace with demand.

OHV Management

The CIAA for OHV management is composed of the RMPPA. Effects of BLM actions on OHV management by BLM within the RMPPA are presented in Section 4.9 above.

Cumulative impacts to OHV would result from BLM actions authorizing surface disturbance and disruptive activities when combined with similar activities on private and state lands. These impacts would primarily result from oil and gas or wind power development that would reduce the quality of most OHV experiences because of additional improved roads, night lighting, industrial traffic, noise, and visual resource degradation associated with industrial development. The generation of additional improved roads in areas that historically had only primitive vehicle routes would detract from the rural experience most OHV users in the region prefer. Mitigation is not required when developing private lands, so impacts on private lands may be much more severe than those that occur on federal lands. For example, facilities may be brightly colored, roads may be poorly designed, pad size may not be minimized, and facilities may be located on ridgelines, where they would be visible for many miles. All of these impacts would detract from the quality of the OHV setting. Development of this sort would result in a long-term substantial reduction in the quality of OHV experiences available in the RMPPA, as well as the elimination or reduction of OHV use in these areas, which constitutes a significant impact to OHV.

In addition to roads, other surface disturbing and disruptive activities include the construction of pipelines, wind turbines, well pads, tanks, reservoirs, towers, wind power generation facilities, transmission lines, and communication sites that reduce the desirability of OHV opportunities in their proximity.

Wind power developments on private or state lands would potentially require BLM to issue ROWs for access roads, power lines, and other facilities that would create visual intrusions on federal lands. Wind power energy construction on a combination of federal and nonfederal lands is expected to dramatically increase within the next 20 years. Mitigation is not required when developing private lands, so impacts on private lands may be much more severe than those that occur on federal lands. The development and associated facilities would potentially affect OHV settings because of the height and size of the turbines, roads and road closures, noise, and visual intrusions that are visible from great distances. Wind power developments would significantly detract from the typical middle country OHV settings in the RMPPA by creating obvious and dominating visual intrusions on the horizon that would displace some OHV users from the area.

Current oil and gas development projects in the western RMPPA, such as Desolation Flats, Continental Divide/Wamsutter II, Hay Reservoir, Creston Blue Gap, Mulligan Draw, and the Atlantic Rim CBNG

Exploration PODs, have had significant impacts on the OHV setting. Large portions of these developments, in addition to the non-mitigated developments within the private and nonfederal lands, particularly those in the checkerboard and other intermixed land ownership area, are dominated by roads, well pads, tanks, and drill rigs that destroy the natural character of the landscape. These areas are no longer desirable places to use OHVs, view wildlife, or hunt because of the long-term industrial setting which would displace OHV users. This development has resulted in a long-term substantial reduction in the quality of OHV experiences available in the RMPPA, as well as the reduction of OHV use in these areas, which constitutes a significant impact to OHV.

Pending projects, such as Continental Divide-Creston (CDC) and Atlantic Rim, would further reduce OHV opportunities in the Red Desert. Both of these projects include the checkerboard land pattern that contains private and state as well as federal lands. While CDC would be infill drilling primarily in areas where most OHV users have already been displaced by oil and gas development, Atlantic Rim (270,000 acres) would displace a significant number of hunters (most of whom use OHVs) because the area is one of the most heavily hunted in the state. More than 6,000 hunters had licenses in 2005 for the hunt areas that contain the Atlantic Rim Project Area. The recent development of the pods in the Atlantic Rim area is already reducing the acreage of relatively undisturbed and therefore desirable huntable land and OHV opportunities in these hunt areas. As long as WGFD issues licenses, the area will be hunted, although the quality of the hunting experience will decline as development expands.

Seasonal, temporary, and complete closures to OHV use in restricted areas within the CIAA would also cause cumulative impacts to recreational OHV use. Potential closures would include restrictions created in response to riparian and wildlife habitat management plans, adverse impacts from OHV use in localized areas, wilderness study area management actions, and private land closures where the public once was allowed to use OHVs. Access restrictions across private lands in the checkerboard will continue to create access problems for OHV users. Walk-in areas, where the Wyoming Game and Fish Department has leased rights for public hunting access, provide public access in specific portions of the checkerboard. Walk-in areas provide access to public lands that otherwise have no legal public access. Unless otherwise posted, OHV use is not allowed in Walk-in areas. Areas that once were open to OHV use for hunting with landowner permission are now closed to OHV use for hunting. In combination of OHV restrictions and displacement from the energy development, this could cumulatively result in a great loss of OHV opportunities.

WGFD has several projects underway that would improve wildlife habitat. These include vegetation treatments, livestock grazing management, and native fish restoration. All of these projects, when combined with similar BLM actions on federal land, would improve the quality of the habitat and, therefore, the OHV setting.

Many of the Little Snake River Conservation District (LSRCD) projects improve the health of rangelands, fisheries, and wildlife habitat. These projects include the Muddy Creek Water Storage Reservoirs; Wetlands Development Expansion; Stock Water Developments; rangeland enhancements, improvement, and treatment; Savery Creek fisheries enhancement; Battle Creek Fisheries Enhancement; and vegetation management. These projects, in combination with BLM grazing systems and range improvements, help improve the quality of the habitat and visual resources and, therefore, the OHV setting in the LSRCD area.

Medicine Bow National Forest Land and Resource Management Plan includes a transportation plan for 286,266 acres of semiprimitive nonmotorized and 223,056 acres of semiprimitive motorized recreation opportunities. The Forest provides alternative OHV settings for those people who have been displaced from the western RMPPA by oil and gas development.

The Sage Creek Road paving project planned from Rawlins to Battle would significantly improve recreational access to BLM and USFS lands south of Rawlins. The present road is gravel, which is often quite washboarded to the point of making driving difficult and uncomfortable. Paving this road would make it safer and suitable for ordinary automobiles. While this project would allow automobiles to access the area, it would not detract from the quality of the OHV opportunities accessed by Sage Creek Road. It would also reduce the dust and sedimentation associated with the road.

Because of the impacts associated with oil and gas development, there would be a long-term elimination of a substantial portion of OHV opportunities or a substantial reduction in the quality of OHV experiences available in the RMPPA under all four alternatives. Recreationists would be displaced from industrialized areas in the western half of the RMPPA because these areas would no longer be desirable OHV settings. These impacts would be most significant in Alternative 2 because of fewer restrictions on surface disturbing and disruptive activities and increased acreage available for development. Impacts would be least significant in Alternative 3 because of increased restrictions on surface disturbing and disruptive activities and limitations on the acreage available for development. Most of the identified impacts under Alternative 3, other than those of oil and gas development, would improve the quality of OHV settings. Alternative 1 would have impacts of a lesser magnitude than Alternative 2, but greater than Alternatives 3 or 4, again because of the comparative level of the same types of restrictions and limitations. Alternative 4 would have impacts of a greater magnitude than Alternative 3, but lesser than Alternatives 1 or 2, because restrictions applied to mineral activities on federal lands by various resource programs under Alternative 4 would reduce adverse oil and gas impacts more than those applied under Alternatives 1 or 2. Under Alternative 4, with the exception of minerals, most BLM management actions would have a positive impact on OHV settings in the RMPPA.

Paleontology

The paleontology resource CIAA consists of the entire RMPPA because paleontological resource management is specific to the RMPPA and would not likely be influenced by activities occurring outside the RMPPA. Effects to paleontological resources from the RMP alternatives are presented in Section 4.10 above.

Development activities occurring on private and state lands with no federal jurisdiction would have the greatest cumulative impact on paleontological resources within the RMPPA. A large portion of the minerals activities analyzed above would occur on private and state lands, especially within the checkerboard landownership areas. These surface disturbing activities result in the damage or loss of paleontological resources by removing or altering the context of these sites, thereby limiting the potential to extrapolate data. Minimal cumulative effects to paleontological resources are anticipated from activities on other federal lands.

Potential impacts to paleontological resources would result from surface disturbing and disruptive actions. Under all RMP alternatives, impacts to paleontological resources would be mitigated by the inventory and mitigation procedures, which require identification and mitigation of paleontological resources before surface disturbing and disruptive activities.

The potential for cumulative impacts to the Como Bluffs NNL also exists because large portions of the lands containing the NNL are private. Although Como Bluffs is designated as an NNL, this designation does not impose restrictions on private or state lands. Therefore, the lack of protections afforded these resources could result in impacts to the paleontological resources in the NNL.

The greatest potential for impacts to paleontological resources would occur under Alternative 2 because of increased surface disturbance activities and limited protection to paleontological resources as a result

of a decrease in restrictions from other programs. However, because of increased surface disturbance, more acreage would be inventoried, potentially identifying paleontological resources before development. The potential for impacts to paleontological resources would be less under Alternative 3 because of increased restrictions placed on surface disturbance; however, less acreage would be inventoried than any other alternative.

Recreation Resources

The CIAA for recreation resources is composed of the RMPPA. Effects on recreation resources on public lands administered by BLM within the RMPPA are presented in Section 4.11 above.

Potential impacts to recreation would result primarily from surface disturbance and other industrial activities on both federal and nonfederal lands. These impacts would primarily result from oil and gas or wind power development that would reduce the quality of most recreational experiences because of increased roads, night lighting, industrial traffic, noise, and visual resource degradation associated with industrial development.

Cumulative impacts to recreation would result from BLM actions authorizing surface disturbance and disruptive activities when combined with similar activities on private and state lands. These impacts would primarily result from oil and gas or wind power development that would reduce the quality of most recreational settings and experiences because of additional improved roads, night lighting, industrial traffic, noise, and visual resource degradation associated with industrial development. The generation of additional improved roads in areas that historically had only primitive vehicle routes would detract from the middle country experience most recreationists in the region prefer. Mitigation is not required when developing private lands, so impacts on private lands may be much more severe than those that occur on federal lands. For example, facilities may be brightly colored, roads may be poorly designed, pad size may not be minimized, and facilities may be located on ridgelines, where they would be visible for many miles. All of these impacts would detract from the quality of the recreational setting. Development of this sort would result in a long-term substantial reduction in the quality of recreational experiences available in the RMPPA, as well as the reduction of recreation use in these areas, which constitutes a significant impact to recreation.

Current oil and gas development projects in the western RMPPA, such as Desolation Flats, Continental Divide/Wamsutter II, Hay Reservoir, Creston Blue Gap, Mulligan Draw, and the Atlantic Rim CBNG Exploration Pods, have had significant impacts on the recreational resources and settings. Large portions of these developments, in addition to the non-mitigated developments within the private and nonfederal lands, particularly those in the checkerboard and other intermixed land ownership area, are dominated by roads, well pads, tanks, and drill rigs that destroy the natural character of the landscape, resulting in displacing recreationists to alternative areas. These development areas are no longer desirable for dispersed primitive to semi-primitive recreational activities, such as hiking, camping, backpacking, viewing wildlife, or hunting because of the long-term industrial setting. This is a long-term elimination of recreational use in these areas, and therefore a significant impact on recreation resources.

Pending projects, such as CDC and Atlantic Rim, would further reduce recreational opportunities in the western RMPPA. Both of these projects include the checkerboard land pattern that contains private and state as well as federal lands. Although CDC would be infill drilling primarily in areas where most recreationists have already been displaced by oil and gas development, Atlantic Rim (270,000 acres) would displace a significant number of hunters because the area is one of the most heavily hunted in the state. Deer hunt areas 82 and 84 had 2,473 licenses in 2005. Antelope hunt areas 53 and 55 had 852 licenses. Elk hunt areas 21 and 108 had 2,854 licenses in 2005. A large portion of these hunters would have used the area within the project boundaries because there are attractive primitive camping areas,

reasonably good access, and they can hunt all three species from one camp. The habitat for these species has historically been quite good in the area, and hunter success rates have been relatively high, both of which made it a desirable place to hunt.

The recent development of the PODs in the Atlantic Rim area is already reducing the acreage of relatively undisturbed and, therefore, desirable huntable land in these hunt areas. As hunters become more concentrated in the remaining undeveloped portions of these hunt areas, the probability of hunting accidents increases. As development progresses, there will be an increased risk of traffic accidents, particularly when the hunters are added to the industrial traffic on the primary access roads. The development in Atlantic Rim area is displacing hunters as well as comprising public health and safety by increasing hunter densities in other areas and adding to traffic on local roads, regardless of the alternative considered.

Walk-in areas, where the Wyoming Game and Fish Department has leased rights for public hunting access, provide additional public access in specific portions of the checkerboard. Walk-in areas provide access to public lands that otherwise have no legal public access. This helps reduce hunter concentrations on blocked federal lands, which are preferred by many hunters because they do not have to get landowner permission to hunt them. Hunters in walk-in areas do not need to get landowner permission, so these areas are as easy to use as blocked public lands. Hunters displaced by oil and gas development may increase use of walk-in areas that do not have as much development.

WGFD has several projects underway that would improve wildlife habitat. These include vegetation treatments, livestock grazing management, and native fish restoration. All of these projects, when combined with similar BLM actions on federal land, would maintain or improve the quality of the habitat and visual resources, and therefore the recreational setting.

Many of the LSRCD projects improve the health of rangelands, fisheries and wildlife habitat. These projects include the Muddy Creek Water Storage Reservoirs; Wetlands Development Expansion; Stock Water Developments; rangeland enhancements, improvement, and treatment; Savery Creek fisheries enhancement; Battle Creek Fisheries Enhancement; and vegetation management. All of these projects help improve the quality of the habitat and visual resources and, therefore, the recreational setting in the LSRCD area.

Medicine Bow National Forest actions also enhance recreational opportunities in the RMPPA. The USFS WSR recommendations for the Upper North Platte River and portions of the Encampment River help ensure that the water quality flowing across BLM lands from these rivers will remain of good quality because these designations require management that prohibits most human impacts. The Forest Land RMP also includes a recommendation for designation of the Encampment River Wilderness Area, further protecting the watershed above BLM's Encampment River WSA and potential WSR.

Medicine Bow National Forest Land and Resource Management Plan includes a transportation plan for 286,266 acres of semiprimitive nonmotorized and 223,056 acres of semiprimitive motorized recreation opportunities. The forest provides alternative recreational settings for those people who have been displaced from the western RMPPA by oil and gas development.

The Sage Creek Road paving project planned from Rawlins to Battle would significantly improve recreational access to BLM and USFS lands south of Rawlins. The present road is gravel, which is often quite washboarded to the point of making driving difficult and uncomfortable. Paving this road would make it safer and suitable for ordinary automobiles. It would also reduce the dust and sedimentation associated with the road.

Increased recreational demand for dispersed recreational opportunities would conflict with approved land uses, such as development activities that would alter recreational settings. Recreational experiences would be degraded by increased visual impacts, noise, dust, industrial traffic, and public health and safety hazards on roads and in proximity to facilities. Hunting opportunities would be diminished in developed areas as a result of the displacement or loss of game animals. Restrictions such as road closures could reduce recreational access in some areas.

Under Alternative 1, impacts associated with oil and gas development would reduce the acreage and quality of recreational opportunities available in the RMPPA. Recreationists would be displaced from industrialized areas in the western half of the RMPPA because these areas would no longer be desirable recreation settings. This would be a significant impact because there would be a long-term elimination of recreational use in a large area.

Alternative 2 would have the same impacts from oil and gas development as Alternative 1, but to a much greater degree, because of much more acreage open to leasing with only standard stipulations and much less acreage open to leasing with more restrictive stipulations. Alternative 2 would have more significant impacts on recreational settings and opportunities than any other alternative because there would be a long-term elimination of recreational use over more acreage than in the other alternatives.

Alternative 3 would have fewer impacts on recreation than any other alternative because of reduced acreage open to mineral development and increased resource protections. Minerals actions would still have a significant impact on recreation because of the long-term elimination of recreational use in oil and gas development areas. Most of the identified impacts under Alternative 3, other than those of oil and gas development, would improve the quality of recreation settings.

Under Alternative 4, with the exception of minerals, most BLM management actions would have a positive impact on recreational settings in the RMPPA. Stipulations applied to mineral activities on federal lands by various resource programs would reduce adverse oil and gas impacts, but impacts to the quality of recreational settings that displace recreationists would still occur. Impacts on adjacent nonfederal lands would potentially adversely affect recreation settings as well. Thus, oil and gas development would cause significant impacts, because there would be a long-term elimination of recreational use in a large area.

Special Recreation Management Areas

The CIAA boundary for SRMAs includes the entire RMPPA because activities and resources occurring outside the RMPPA are not expected to affect SRMA designations inside the RMPPA. Effects of BLM actions on lands administered by BLM within the RMPPA are presented in 4.13 above.

The largest area within the RMPPA containing other federal surface ownership is the Medicine Bow National Forest, the majority of which is located in the south-central portion of the RMPPA. BLM lands in the Jelm Mountain SRMA abut several miles of the MBNF boundary. Primitive routes cross this boundary and provide access to the Laramie River and its tributaries for fishing and camping. Actions of MBNF lands that alter travel patterns, runoff, visitation, or environmental conditions would potentially affect the recreation settings on adjoining downstream SRMA lands.

Wind power developments on private or state lands would potentially require BLM to issue ROWs for access roads, power lines, and other facilities that would create visual intrusions on federal lands. Wind energy potential is outstanding to superb north of the Shirley Mountains. Wind power facilities would potentially affect SRMA recreational settings because of the height and size of the turbines, roads, road closures, noise, and visual intrusions. Wind power developments of this size would significantly detract

from the typical middle- to front-country ROS settings in the RMPPA by creating obvious and dominating visual intrusions on the horizon that would displace some recreationists from the area.

Oil and gas development in the SRMAs would be similar to the impacts described in Section 4.11 (specifically the SRMAs), as the minerals RFD incorporates well numbers and surface disturbance projected to occur on both federal and nonfederal minerals.

The Sage Creek Road paving project planned from Rawlins to Battle would significantly improve recreational access to BLM and USFS lands south of Rawlins, including access to the CDNST SRMA. The present road is gravel, which is often quite washboarded to the point of making driving difficult and uncomfortable. Paving this road would make it safer and suitable for ordinary automobiles. It would also reduce the dust and sedimentation associated with the road.

Forest product harvests on private or state lands in the Shirley Mountains, Jelm Mountain, or the Pedro Mountains in or adjacent to the SRMAs would potentially impact recreation resources and experiences in the SRMAs with erosion, new roads, ROWs, sedimentation, habitat fragmentation, noise, traffic, and dust.

BLM coordination with WGFD on projects would ensure that construction of range improvements and vegetation manipulation projects would strive to maintain rangeland health standards. These projects, including fence modifications, fence construction, vegetation treatments, wildlife transplants, livestock grazing management, and habitat treatments on private lands (Table 4-7) initiated on BLM or non-BLM lands, would be designed in conjunction with BLM initiated projects (Appendix 33), to maintain and enhance the quality of habitat within the SRMAs. These projects would maintain or enhance recreational settings, opportunities, activities, and goals within the SRMAs.

Under all alternatives, oil and gas development would potentially impact SRMA recreation experiences if development occurred adjacent to the CDNST or North Platte River SRMAs. Forest product harvests on private or state lands in the Shirley Mountains, Jelm Mountain, or the Pedro Mountains, in or adjacent to the SRMAs, would potentially impact recreation resources and experiences.

Cumulative impacts would be the greatest under RMP Alternatives 3 and 4 as a result of the greatest amount of acreage designated as SRMAs under these alternatives and the least amount of projected resource development activities. Adverse cumulative effects would be the greatest under Alternative 2 because it allows the greatest amount of development activity with the least amount of restrictions.

Socioeconomics

The boundary for socioeconomics extends beyond the RMPPA and is made up of Albany, Laramie, Carbon, and Sweetwater Counties. The socioeconomic effects of BLM actions on these counties are presented in Section 4.12 above.

The cumulative socioeconomic impacts associated with the oil and gas development throughout Southwest Wyoming extends beyond the study area boundaries. Therefore, the oil and gas impacts are summarized in

Table 4-3 of Section 4.12 summarizes only the estimated federal, state and private economic impacts occurring as a result of estimated oil and gas and development within the study area.

Examining the cumulative oil and gas activity reveals that the percentage of producing wells within the study area accounts for about 63 percent of the total producing wells and 94 percent of the remaining

wells that can still be drilled/produced in southwest Wyoming. To understand how these percentages were computed, Table 4-11 was developed to illustrate the producing wells and remaining wells that can still be drilled/produced by project.

Table 4-11. Producing Wells and Remaining Wells that Can Still Be Drilled/Produced, by Project

Project	Date ROD/DR Signed	Producing Wells	Remaining Wells that Can Still Be Drilled/ Produced	Total
Study Area Projects (Albany, Carbon, Laramie, and Sweetwater)				
Mulligan Draw	9/23/1992	17	23	
Creston Blue Gap	10/4/1994	181	94	
Dripping Rock/Cedar Break	4/3/1985	24	34	
Sierra Madre	9/21/1987	35	11	
Hay Reservoir	6/24/1992	28	0	
Continental Divide/Wamsutter II	5/24/2000	864	1,366	
Continental Divide/Creston	Pending[1]	0	0	
South Baggs	8/8/2000	12	38	
Seminoe Road	Pending[1]	0	0	
Atlantic Rim	Pending[1]	0	0	
Atlantic Rim Coalbed Natural Gas Exploration Pods	Various	44	156	
Moxa Arch	3/7/1997	947	1,227	
Moxa Arch Infill	Pending[1]	0	0	
Fontenelle	8/16/1996	1,052	1,141	
Stagecoach	9/27/1995	9	59	
Bravo Unit	7/20/1995	7	4	
Jack Morrow Hills CAP	7/19/2006	46	205	
Jonah/McMurry Prospect (larger boundary)	8/3/1994	55	0	
Bitter Creek Shallow Gas Project Area	6/24/2005	53	61	
Pacific Rim Shallow Gas	9/1/2004	Unknown	150	
Vermillion Basin	8/15/2002	0	56	
Jonah Infill	3/14/2006	73	3,027	
Desolation Flats	7/27/2004	21	364	
Lower Bush Creek	8/22/2003	0	22	
Wolverine/Shell	5/21/2001	0	3	
Little Monument	1/9/2004	139	31	
Hiawatha Regional Energy Project	Pending[1]	0	0	
Subtotal		**3,607**	**8,072**	**11,679**

Project	Date ROD/DR Signed	Producing Wells	Remaining Wells that Can Still Be Drilled/ Produced	Total
Projects Outside the Study Area				
Riley Ridge	1/25/1984	29	209	
Burley	6/7/1994	31	1	
Jonah II Field	4/27/1998	588	0	
Pre-LaBarge CAP	N/A	368	0	
LaBarge Coordinated Activity Plan Area	8/16/1991	487	45	
Soda Unit	4/12/1989	3	18	
Castle Creek	10/24/1983	8	10	
Hickey Mountain	5/13/1987	26	50	
Road Hollow	9/1/1983	4	6	
East LaBarge	5/29/1992	19	9	
Bird Canyon	6/25/1993	6	8	
PreAnticline EIS	N/A	16	0	
Pinedale Anticline	7/27/2000	540	160	
South Piney	Pending[1]	0	0	
Pinedale Anticline SEIS	Pending[1]	0	0	
Subtotal		**2,125**	**516**	**2,641**
Total		**5,732**	**8,588**	**14,320**

[1] The projects denoted as "pending" are projects that have not been included in the reasonably foreseeable future oil and gas projects because no decision has been issued. Initial well proposals for the pending projects are estimated to be 22,570 wells as of the date of publication of this RMP FEIS.

The cumulative oil and gas activity expected to occur throughout southwest Wyoming will likely increase the intensity of the social and economic impacts in this region. For example, the oil and gas boom currently occurring throughout portions of southwest Wyoming has already intensified the demand for housing, social services, law enforcement, infrastructure, services addressing drug abuse, etc. Therefore, as the oil and gas sector continues to expand at an accelerated pace, it is reasonable to assume that the socioeconomic impacts will be intensified throughout this region of the state. Also, if oil and gas development occurs at expected rates within the RMPPA and throughout southwest Wyoming, there will be a substantial increase in mineral tax revenues, total earnings, and employment.

The intensity of development in the oil and gas sector is determined by pace and timing which, to a large degree, is determined by public policy and also market forces. Even though leasing oil and gas is a discretionary action, the pace of development reflects market forces established by various factors beyond the management decisions of BLM. These include national and international energy demand and prices, production factors within the RMPPA, and business strategies of operators. As a result, it is difficult to estimate the pace of development, which means the actual cumulative impacts might vary if the rate of production changes during the study period. It also means that the intensity and duration of the boom will vary depending on pace and the resultant bust will be heightened if pace is accelerated. To illustrate the

point, it is likely that communities within the study area will be affected by the "boom and bust" cycle and the intensity of this cycle will be a function of pace. Moreover, it is anticipated that this phenomenon will likely cause hardships for areas that must improve or expand infrastructure and services to accommodate the large, temporary increases in population. However, to some extent, these hardships will be offset by the tax revenues generated by the oil and gas activity.

As mentioned above, many of the cumulative socioeconomic impacts associated with oil and gas development are already occurring in the region. Assuming that the current pace of development is either sustained or increased, the demand for oil and gas employees will continue to outstrip the supply. Moreover, it is likely that individuals from outside the area will continue filling the bulk of these jobs into the future. However, even though many of the oil and gas workers come from outside the region, it is likely there will be a growth in population in certain parts of the study area that can be directly attributed to the oil and gas development.

Increasing employment from oil and gas development throughout Southwestern Wyoming is expected to impact communities such as Rock Springs, Green River, Kemmerer, Pinedale, Rawlins, and the other small communities scattered throughout Southwest Wyoming. But the ability to absorb the anticipated impacts will vary depending on the individual community's ability to absorb the anticipated growth. Nonetheless, even though Rock Springs had undergone declines in population back in the 1990s, because it serves as an oil and gas service center it, too, will feel the pressures associated with the oil and gas boom, as will communities like Rawlins, Green River, Pinedale, and Kemmerer. However, the larger impacted communities in Southwest Wyoming may be in a slightly better position to absorb increases in population relative to the smaller ones. However, if the oil and gas development continues at either the current pace or an accelerated pace, all of the impacted communities will be challenged to keep up with the demands associated with rapid oil and gas development. For instance, communities and unincorporated areas that are impacted as new individuals move into the area might not be able to fully absorb changes in population as they occur. If these increases occur in the short term, many of these communities will likely experience a boom and bust cycle that is driven by oil and gas development.

Increased oil and gas development throughout the region will increase the mineral tax revenues and royalty payments that can be used by local and state government to help mitigate the anticipated impacts. For some counties, the increases are expected to be significant and will remain a major source of revenue for many years to come for various jurisdictions.

It should be noted that even though substantial tax revenues and royalty payments are produced from oil and gas activity, rapid oil and gas development can alter the attitudes and opinions of local area residents. Generally, this happens because of an increase in conflicts between conservation-minded individuals and groups and the pro-development community. Despite these conflicts, residents within the RMPPA have long held opinions that a need exists to balance conservation of natural resources with the economic viability of resource-based industries. As such, residents generally support the development of minerals and energy as long as these activities do not damage wildlife habitat or degrade the quality of recreational experiences. Consequently, some local residents will support further development activities, whereas others will be dissatisfied if development activities were to reduce hunting opportunities or degrade recreational activities. In addition, others might be dissatisfied if areas within the RMPPA are not left in an undisturbed state.

Changes in population trends in the study area brought on by increased oil and gas development may cause a change in custom and culture because some areas have a long-standing history of growth driven by minerals development, and some do not. For example, communities such as Rock Springs and Rawlins developed, in part, around mineral extraction industries. Therefore, they would likely support oil and gas development. However, other communities that have been more dependent on, for example, agriculture

and recreation, may be less inclined to welcome the changes in custom and culture as population changes to support an economy dominated by oil and gas activity. But it is inevitable that changes will occur and will likely bring new individuals to the area who might possess different opinions and values from current residents. This can lead to changes in overall social trends in localized areas.

No significant cumulative impacts to environmental justice would occur under any alternative because minority and/or low-income populations would not be disproportionately affected compared with other segments of the general population.

Special Designations/Management Areas

Wilderness Study Areas

The CIAA boundary for WSAs includes the entire RMPPA because activities and resources occurring outside the RMPPA are not expected to affect WSAs inside the RMPPA. Effects of BLM actions on lands administered by BLM within the RMPPA are presented in 4.13 above.

The largest area within the RMPPA containing other federal surface ownership is the Medicine Bow National Forest, the majority of which is located in the south-central portion of the RMPPA. Those portions of the Medicine Bow National Forest within the RMPPA comprise about 970,990 acres. In its 2003 Medicine Bow Revised Land and Resource Management Plan, the USFS recommended 27,963 acres of land to Congress for wilderness designation (in addition to its existing 78,850 acres of wilderness). Part of this recommendation included an expansion of the Encampment River Wilderness, upriver from the BLM Encampment River Canyon WSA. The addition of this acreage to wilderness lands in the Encampment River, drainage would help ensure the water quality flowing through the Encampment River Canyon WSA and downstream to the water supply for the towns below. Additional wilderness acreage would also ensure that human impacts would not occur on the proposed expansion that could potentially impact the WSA.

MBNF WSR recommendations for designation of additional waterway segments along the Encampment and North Platte Rivers as Wild and Scenic Rivers, when combined with BLM WSR recommendations for Encampment and North Platte Rivers, would benefit the Encampment River Canyon and Prospect Mountain WSAs by providing additional management protections from human impacts along the waterways upstream from the WSAs.

Wind energy development on state and private lands north of the Ferris Mountains WSA would significantly reduce the quality of the viewshed seen from the Ferris Mountains with wind turbines, roads, and facilities that would be visible from great distances. Wind energy development on these lands would also significantly detract from the quality of the view of the Ferris Mountains as seen from State Highway 220. Therefore, while wind energy development north of the Ferris Mountains would not impair the WSA's suitability for designation as wilderness, it would have significant adverse affects in the visual quality of the area as seen from the WSA and when viewing the WSA from key observation points along Highway 220.

Potential cumulative impacts from development projects on state and private lands (mostly pipelines and wells associated with oil and gas development) would potentially occur adjacent to Adobe Town or Ferris Mountains WSAs. Cumulative impacts could include degradation of visual resources, soils, watershed resources, and vegetation caused by these development activities outside these WSAs. BLM restrictions on surface disturbance, mitigations for VRM, preferred routes for ROWs, and areas of controlled surface use would likely reduce possible effects; however, activities on state and private lands that might not be subject to restrictions would potentially compromise viewsheds, air quality, opportunities for solitude,

hydrologic function, and the sense that the area is unaltered by man, depending on the location of private and state land and level of activity occurring on these lands. Examples would be development on state lands at the headwaters of tributaries to Skull Creek that could affect the drainage in Adobe Town WSA or on private or state lands associated with the Mahoney Unit south of the Ferris Mountains WSA that would affect the viewshed, air quality, and primitive character of the area.

Under Alternative 1, oil and gas development activity adjacent to the Adobe Town and Ferris Mountains WSAs would potentially adversely affect the wilderness character and viewsheds of the WSAs. Wind farms would adversely affect viewsheds from Highway 220 and from the Ferris Mountains WSA if development occurred north of the Ferris Mountains. Other activities on federal, state, or private lands would be unlikely to adversely affect WSAs. Fuels management would potentially improve vegetative resources in WSAs. Proliferation of unauthorized routes that could impair wilderness suitability would potentially continue in the Prospect and Encampment River Canyon WSAs as long as roads existing in 1980 remain open. WSR suitability determinations would not be made, and continued protection of ORVs would have negligible impact on eligible waterway segments in WSAs.

Alternative 2 would have the same impacts from oil and gas development as Alternative 1, but to a much greater degree, because much more acreage would be open to leasing with only standard stipulations and much less acreage open to leasing with more restrictive stipulations. Oil and gas development activity adjacent to the Adobe Town and Ferris Mountains WSAs would potentially adversely affect the wilderness character and viewsheds of the WSAs. Wind farms would adversely affect viewsheds from Highway 220 and from the Ferris Mountains WSA if development occurred north of the Ferris Mountains. None of the eligible waterway segments would be found suitable for WSR designation, so WSR would have no impact on WSAs.

Alternative 3 would have fewer impacts than any other alternative there would be more resource protections from various resource programs. This would reduce adverse oil and gas impacts, but adverse impacts to the Ferris Mountains and Adobe Town WSAs would still potentially occur, particularly in response to development of nearby nonfederal lands that are not subject to federal regulations. Most activities, other than oil and gas or wind power, would have a negligible impact on WSAs. Wind farms would not be developed on avoidance areas, but would potentially be constructed on private or state lands north of the Ferris Mountains, where they would adversely affect viewsheds from Highway 220 and from the Ferris Mountains. Management actions under Alternative 3 would afford more protection of wilderness characteristics than other alternatives.

Under Alternative 4, with the exception of oil and gas and wind energy, most activities would have a negligible impact on WSAs. WSAs would potentially be impacted by development of nearby nonfederal lands not subject to federal regulations that would mitigate impacts. Wind farms in proximity to WSAs would have detrimental impacts on viewsheds. Proposed management actions would protect wilderness character better than those of Alternatives 1 or 2. Wilderness qualities would be protected and enhanced by closing roads to OHV use and designating VRM Class II areas adjacent to the Bennett Mountains and Ferris Mountains WSAs.

Oil and gas and wind farm development would potentially have a significant impact on WSA hydrological systems and viewsheds in all alternatives. Alternative 2 would have the greatest potential for adverse impacts on WSAs, while Alternative 3 would have the least. Alternative 4 would have less potential for adverse impacts than Alternative 1, largely because of larger avoidance areas and VRM adjustments adjacent to WSAs. However, activities on state and private lands would still potentially impact the WSAs.

Areas of Critical Environmental Concern

The CIAA boundary for ACECs is composed of the RMPPA because activities and resources occurring outside the RMPPA are not expected to affect ACEC activities inside the RMPPA. Effects to ACECs on public lands administered by BLM within the RMPPA are described above in Section 4.13.

Blowout Penstemon, Cave Creek Cave, and Sand Hills/JO Ranch Expansion ACECs have been assessed to determine cumulative impacts resulting from BLM-initiated actions when combined with non-BLM initiated actions.

BLM coordination with WGFD, NRCS, and various conservation districts initiated projects (Table 4-7) on non-BLM lands, or jointly on BLM lands, would ensure that any adjustments to herd objectives, construction of range improvements, and vegetation manipulation projects would strive to maintain rangeland health standards.

Untreated weeds on non-BLM lands that spread to adjacent BLM lands would result in degradation of native habitat. Weed treatments on non-BLM lands intermingled with or adjacent to ACECs are the responsibility of the private landowner or lessee. Coordination with non-BLM landowners in the development and application of weed treatments would assure that weeds are identified and treated on all ownerships where weeds compete with native vegetation communities.

The Blowout Penstemon ACEC comprises of 17,050 acres BLM and 18,440 acres non-BLM (private, state, and other federal). Any proposed surface disturbing activity on public land would include survey and project design so as to avoid disturbance to occupied or potential habitat. Blowout penstemon habitat located outside of federal jurisdiction is not afforded the same protection measures; thus, blowout penstemon habitat and plants would have a greater likelihood of being damaged because there are no penalties for the removal or destruction of plants on private or state lands under ESA. However, any surface disturbing activity occurring on non-BLM lands within stabilized dune areas would potentially increase habitat by destabilizing the vegetated dunes and creating new areas for blowout penstemon colonization.

Livestock management actions on private and state lands would potentially result in the construction of new fences in occupied and potential blowout penstemon habitat. Coordination with nonfederal landowners for placement of new fences and reconstruction and/or removal of existing fences would be conducted to ensure minimal disturbance to populations of blowout penstemon. When existing fences cross occupied habitat, livestock trailing along them would lead to trampling of plants. Trailing along fence lines or to water sources would potentially destabilize dunes and create new habitat or slow vegetation stabilization of active dunes. Livestock grazing would potentially lead to the introduction and spread of invasive weeds, resulting in greater competition between weeds and native vegetation and potentially limit the expansion of blowout penstemon.

In the Blowout Penstemon ACEC, cooperation with other landowners would be required to allow fire to be used as a management tool, where wildland fire would normally result in suppression because of the land ownership pattern, to create the early successional habitat required for blowout penstemon establishment.

Large, commercial saw timber harvests have occurred on adjacent and nearby private lands upstream of Cave Creek Cave ACEC, and additional commercial harvests may occur in the future. Private land timber harvests are not regulated by BLM, and commercial harvests, associated road developments, and stream crossings would degrade stream bank vegetation, soils, and watershed quality relative to temperature of water entering Cave Creek. Upstream commercial timber harvests, especially clear-cuts conducted on

private lands, would jeopardize the watershed and water quality flowing into Cave Creek. Upstream timber harvests would increase the potential for harvest debris or other obstructions to increase sediment flows into the creek channel. Obstructions would possibly affect the volume of water or stream channel routes currently transporting water into Cave Creek Cave. Upstream timber harvests on private lands have historically involved clear-cuts. Cooperation and coordination with private landowners would be important to maintain or improve the quantity, quality, and temperature of water entering the cave. Activities associated with private timber sales would continue to cause sedimentation into the streams, changes in stream temperatures, and a larger range of temperatures, which could negatively affect the cave environment. Activities associated with private timber harvest outside of the 1/4-mile buffer would have the potential to increase sedimentation in Cave Creek. This would alter quality, quantity, and temperature of water that flows through the cave system. Even with harvests conducted in association with the Healthy Forest Initiative and Healthy Forest Restoration Act of 2003, the combination of forest management actions on private and public lands could affect the cave system. Small changes in the cave system would affect wildlife habitat, bat hibernaculums and maternity roosts, and possibly lead to abandonment of the cave during critical life cycles of bat species.

The level of private land harvest has limited the opportunities for BLM to implement the necessary forest management actions on public lands needed to meet forest health and Cave Creek Cave ACEC objectives. Cooperation and coordination with private landowners would be necessary during planning and harvesting activities to implement BMPs that include installation of stream crossings to reduce erosion, design of low-impact roads to minimize soil disturbance, and maintenance of buffer zones along stream channels to reduce impacts to water quality and wildlife habitat. Forest management actions on public lands which contribute to overall forest health (Appendix 19) would strive to maintain bat habitat within the cave system.

The potential for catastrophic wildland fires is high in the Cave Creek Cave ACEC and the greater Shirley Mountain area. Past clear-cut timber harvests on all lands, regardless of ownership, have created breaks in the fuel continuity that may reduce the potential for catastrophic wildland fires around the cave.

BLM, county fire departments, NRCS, and WGFD would work cooperatively to design fire and fuels management actions in the Sand Hills ACEC and adjacent state and private lands to manipulate vegetation in a more controlled manner to decrease the potential for catastrophic wildland fires. The potential for catastrophic wildland fires is high, considering the history in the area. Coordinated suppression would limit wildland fires to the smallest acreage possible. This would greatly reduce the potential for wildland fires to remove vegetation cover and damage or destroy the historic buildings associated with the JO Ranch. In addition, this would help preserve the unique vegetation community complex, consisting of antelope bitterbrush, silver sage, big sage, rabbit brush, chokecherry, and serviceberry, that supports the abundance of wildlife (mule deer, elk, greater sage-grouse, sharp-tailed grouse, and raptors) for which the area was originally designated an ACEC.

Oil and gas development in the Sand Hills and Blowout Penstemon ACECs would be similar to the impacts described in Section 4.13 (specifically Sand Hills and Blowout Penstemon ACEC sections) as the minerals RFD incorporates well numbers and surface disturbance projected to occur on both federal and nonfederal minerals.

Wild and Scenic Rivers

The CIAA boundary for WSRs includes the entire RMPPA because activities and resources occurring outside the RMPPA are not expected to affect WSR suitability determinations inside the RMPPA. Effects of BLM actions on WSR lands administered by BLM within the RMPPA are presented in 4.13 above.

Wind power developments on private or state lands would potentially require BLM to issue ROWs for access roads, power lines, and other facilities that would create visual intrusions on federal lands. Cherry Creek would be the most likely waterway segment affected by wind power development because of the outstanding wind potential on private and state lands north of the Ferris Mountains. These lands are downstream of the eligible segment, so the eligible portion of Cherry Creek would not be affected hydrologically by development. The scenic setting of Cherry Creek would be impacted by new visual impacts associated with roads, wind turbines and facilities.

Muddy Creek and Littlefield Creek would be subject to impacts from existing and pending oil and gas projects on federal, state and private lands, such as CDC and Atlantic Rim. Mineral development near Littlefield Creek would compromise fisheries and ecological ORVs if it increased erosion or sedimentation and, thereby, reduced water quality. Mineral development near Muddy Creek would potentially compromise hydrologic ORVs. Industrialization adjacent to these eligible waterway segments would also introduce additional improved roads, night lighting, industrial traffic, noise, and visual resource degradation associated with industrial development that would detract from the recreational experience. Mineral development in proximity to these suitable segments would therefore potentially impair the suitability of the segments for designation as WSRs.

Many of the LSRCD projects improve the health of rangelands, fisheries, and wildlife habitat, including the Muddy Creek Water Storage Reservoirs and vegetation management. These projects help improve the quality of the habitat and visual resources, and therefore the recreational setting in the LSRCD area.

The Medicine Bow National Forest recommended two suitable waterway segments for Wild and Scenic River designation. One recommendation is for 10 miles as wild and 1.3 miles as scenic on the Encampment River. The other is for 13.4 miles as wild and 2.9 miles as scenic on the North Platte River. 7,052 acres are associated with the waterway segments classified as wild and 1,285 with scenic. No other federal agencies have WSRs proposed in the RMPPA.

Medicine Bow National Forest WSR recommendations for the Upper North Platte River and portions of the Encampment River help ensure that the water quality flowing across BLM eligible waterway segments on these rivers will remain of good quality because these designations require management that prohibits most human impacts.

The Medicine Bow National Forest recommendation for a 2,350-acre addition to the Encampment River Wilderness would ensure that adverse impacts do not occur from human activities on federal lands managed by other agencies up-river from the BLM Encampment River suitable waterway segment.

Under Alternative 1, oil and gas development in proximity to Muddy Creek and Littlefield Creek would potentially impair their suitability for designation as WSRs if it increased erosion or sedimentation or otherwise compromised hydrologic, fisheries, or ecological ORVs.

Alternative 2 would have no impact on WSRs because none of the eligible waterway segments would be found suitable for inclusion in the WSR System.

Alternative 3 would have impacts the same as Alternative 1. Oil and gas development in proximity to Muddy Creek and Littlefield Creek would potentially impair their suitability for designation as WSRs if it increased erosion or sedimentation or otherwise compromised hydrologic, fisheries, or ecological ORVs.

Under Alternative 4, MBNF recommendations for WSR designation for portions of the Encampment River would contribute to ensuring water quality flowing across the BLM-recommended portion of the Encampment River would remain good. The MBNF recommendation for a 2,350-acre addition to the

Encampment River Wilderness would ensure that adverse impacts do not occur from human activities on federal lands managed by other agencies.

WHMAs

The CIAA for wildlife habitat management areas (WHMAs) is composed of the RMPPA because activities and resources occurring outside of the RMPPA are not expected to affect WHMAs activities within the RMPPA area. Effects to WHMAs on public lands administered by BLM within the RMPPA are described above in Sections 4.13.

Jep Canyon, Shamrock Hills, Chain Lakes, Laramie Peak, Red Rim/Daley, Pennock Mountain, Wick-Beumee, Laramie Plains Lakes, Upper Muddy Creek Watershed/Grizzly, Cow Butte/Wild Cow, and High Savery Dam have been assessed to determine cumulative impacts resulting from BLM-initiated actions when combined with non-BLM-initiated actions.

The Cow Butte/Wild Cow, Pennock Mountain, Laramie Peak, Upper Muddy/Grizzly, Red Rim/Daley, Chain Lakes, and Wick-Beumee WHMAs are managed under cooperative MOUs with BLM and WGFD. The High Savery WHMA is managed under a cooperative MOU with BLM and the Wyoming Water Development Commission. These MOUs determine the manner in which all cooperating agencies will manage activities in these areas. Cooperative management ensures the qualities for which each of these areas were designated are retained and enhanced.

BLM coordination with NRCS and LSRCD on projects would ensure that construction of range improvements and vegetation manipulation projects would strive to maintain rangeland health standards. These projects, including storage reservoirs, wetlands development and expansion, stock water developments, rangeland enhancements, fisheries enhancement, and vegetation manipulation (Table 4-7) initiated on BLM or non-BLM lands would be designed in conjunction with BLM-initiated projects (Appendix 19), to maintain and enhance the quality of habitat within the WHMAs. Water development projects designed for livestock and wildlife needs would continue to support the diversity of species which inhabit the WHMAs. Some of the developments would be fenced to preclude livestock use. These developments would create wetland habitat for waterfowl nesting and brood rearing. These types of developments would be large enough to sustain water levels during drier periods, supporting wildlife and providing offsite water for livestock.

BLM coordination with WGFD on projects would ensure that construction of range improvements and vegetation manipulation projects would strive to maintain rangeland health standards. These projects including fence modifications, fence construction, vegetation treatments, wildlife transplants, livestock grazing management, and habitat treatments on private lands (Table 4-7) initiated on BLM or non-BLM lands would be designed in conjunction with BLM-initiated projects (Appendix 19), to maintain and enhance the quality of habitat within the WHMAs. Construction of new fences or conversion of existing fences to allow for wildlife passage within migration corridors, across all ownerships, developed in coordination with the WGFD, would decrease wildlife energy loss and stress, injury, entanglement, and mortality.

Vegetation treatments, especially in those WHMAs that are managed jointly with the WGFD by MOUs, would focus on coordinated enhancement of the health and diversity of plant communities through the use of natural fire and management prescriptions. Incorporation of BMPs and other management actions to achieve standards for healthy rangelands would improve health, vigor, structure, and diversity of wildlife habitats. Any improvement in vegetation communities would improve overall wildlife habitat condition. Treatments would target both diversification of wildlife habitat as well as control of weeds.

Untreated weeds on non-BLM lands that spread to adjacent BLM lands would result in degradation of native habitat. Weed treatments on non-BLM lands intermingled with or adjacent to WHMAs are the responsibility of the private landowner or lessee. Coordination with non-BLM landowners in the development and application of weed treatments would assure that weeds are identified and treated on all ownerships to maintain productivity of native vegetation.

BLM, county fire departments, NRCS, and WGFD would work cooperatively to design fire and fuels management actions in WHMAs with intermingled state and private lands to manipulate vegetation in a more controlled manner to decrease the potential for catastrophic wildland fires. Coordinated suppression would limit wildland fires to the smallest acreage possible. This would greatly reduce the potential for wildland fires that remove vegetation cover and associated wildlife habitat.

Oil and gas development in the Shamrock Hills, Jep Canyon, Cow Butte/Wild Cow, Upper Muddy Creek/Grizzly, Red Rim/Daley, and Chain Lakes WHMA would be similar to the impacts described in Section 4.13 (specifically Shamrock Hills, Jep Canyon, Cow Butte/Wild Cow, Upper Muddy Creek/Grizzly, Red Rim/Daley and Chain Lakes WHMA sections) as the minerals RFD incorporates well numbers and surface disturbance projected to occur on both federal and nonfederal minerals.

Options for handling CBNG-produced water in the North Platte and Great Divide Basins are (1) reinjection of produced water to the subsurface, (2) discharge of water to perennial systems, (3) surface discharge into ephemeral channels, and (4) discharge into evaporation/percolation pits. Treatment systems may be required before discharging produced waters, depending on the conditions of WYPDES permits. Options for handling CBNG-produced water in the Colorado River Basin are limited by the Colorado River Salinity Control Forum (Appendix 11) to (1) reinjection of produced water to the subsurface, (2) treatment to less than 500 mg/l TDS and discharge under a freshwater waiver, (3) surface discharge accompanied by salinity offset projects (salt banking), and (4) discharge into evaporation/percolation pits.

Because private landowners and, in some cases, state lands, are not required to implement the same level of mitigation and protection measures as BLM, impacts to soils and watershed resources could be higher on private or state lands. Allowing surface discharge of produced water from CBNG development within WHMAs on all leases, regardless of ownership, would potentially accelerate erosion and deposition, altering stream channel characteristics beyond what would be expected with natural processes. Increased deposition and erosion to stream systems would change the channel dynamics such that undesirable aggradation or degradation would occur. Cutbanks would be more likely to slough on a continual basis, resulting in additional suspended sediments. During high-flow events, there would be an increased potential for erosion because of reduced infiltration and stream armoring, which concentrates flows. In addition, there would be increased salt loading and a decline in water quality downstream. Other water disposal methods would minimize the impacts to channels from produced water surface discharge.

The potential for locatable mineral activity on all land ownerships within WHMAs is anticipated to be minimal. Reasonably foreseeable development, Appendix 33, is anticipated to primarily occur outside of WHMAs. Because of the discretionary nature of salable mineral disposal on public land, disturbances to sensitive resources or values within WHMAs would be precluded. WHMAs containing private or state lands may not be subject to the same restrictions. Therefore, any disturbance from mineral material disposals would likely be sited on nonfederal surface.

Saleable mineral development on nonfederal lands would result in minor habitat fragmentation and animal displacement, depending on the amount, location, and timing of activities. Loss of vegetation attributed to mineral material disposal activities would result in a reduction in available quality habitat and increased competition for forage.

Laramie Peak, Pennock Mountain, and Wick-Beumee WHMAs are contiguous to USFS lands. Forest activities adjacent to these WHMAs related to timber harvest or recreation would combine with activities on BLM lands to increase human presence, resulting in wildlife displacement. Most actions identified in Table 4-7 would not generally be contiguous with BLM lands, reducing the potential for cumulative disturbance to habitat and wildlife.

BLM, USFS, USFWS, WGFD, and LSRCD are party to Colorado River Cutthroat Trout recovery efforts. Joint actions would contribute to the reintroduction and recovery efforts of the fish into historic ranges within the Upper Muddy Watershed/Grizzly WHMA and High Savery Dam area. BLM, USFWS, and WGFD are party to Wyoming toad and non-game sensitive fish recovery efforts. Joint actions that contribute to the reintroduction and maintenance would increase the distribution of rare and unique species, reduce the potential for catastrophic loss of the species, and increase populations so as to ultimately remove species from endangered status.

The WGFD "Access-Yes Walk In Areas and Hunter Management Areas" program, which provides access to private land when combined with BLM access and opportunities, would allow for improved access to both BLM lands and adjacent private lands that are enrolled in the program. In WHMAs with intermingled land ownership patterns, this program would distribute hunting pressure over larger areas, making them more desirable destinations, and reduce the amount of surface disturbance to wildlife habitat.

WHMAs with intermingled private land ownership would have the potential for urbanization. Any coordinated management that maintains the viability of wildlife habitat and grazing land reduces the likelihood that these areas would be sold for non-agricultural purposes.

Research Area—Stratton Sagebrush Steppe

The CIAA used to analyze cumulative impacts for the Stratton Sagebrush Steppe Research Area is the Little Jack Creek and Upper Sage Creek watersheds (HUCs 101800020802 and 101800020901). These watersheds were used as the basic unit of analysis because impacts from management actions proposed under the draft RMP and other existing activity plans are not expected to have cumulative, hydrologic influence beyond this scale. The Middlewood Hill grazing allotment administered by BLM is contained within these watershed boundaries, as well as Sane Creek, Beaver Creek, and the uplands that drain into Upper Sage Creek and make up the Stratton Area. Although many of the wildlife species, such as elk and sage-grouse, that are common in the Stratton Area range beyond the watershed boundaries, most impacts to the research value of this area would be confined to the CIAA.

Middlewood Hill grazing allotment is expected to continue cattle use in this area during the life of the plan. Land ownership patterns within the CIAA include land managed by the State of Wyoming and private lands adjacent to the Stratton Area. Use of these lands is assumed to continue as it has in the past; i.e., as rural range lands. There are ranch buildings and some homes on the private section in Upper Sage Creek and Little Jack Creek.

Significant impacts are not expected under any alternative because the Stratton Area will be managed as a research area by BLM, and state and private land use in and near the Stratton area is not likely to change under all alternatives. Under all alternatives, there would be indirect impacts from minerals development activities in other areas if wildlife migrating into or out of the Stratton Area change patterns of use because of exploration and development activities. However, outside impacts are not likely to affect the research quality of the Stratton Area. If development or land use on private and state lands adjoining the Stratton Area were to occur, such as construction of more housing, it would compromise the research values of this area; however, this type of development or change in land use are extremely unlikely.

The research potential of the area could potentially be compromised under Alternative 1 because livestock grazing actions would primarily focus on livestock production goals. However, impacts are not expected to be significant because this area would be managed as a research area, and livestock grazing would likely conform to research objectives. Under Alternatives 1, 3, and 4, the Stratton Area would include an NSO stipulation in future oil and gas leases. Therefore, the Stratton Area is unlikely to be directly impacted by mineral development. The research potential of the area could be compromised under Alternative 2 because minerals management actions for oil and gas development and livestock management actions might not be compatible with the research objectives for the area.

Historic Trails

The CIAA for the Historic Trails SD/MA consists of the RMPPA and the adjacent lands where the setting of the historic trails within the RMPPA extends outside of the field office boundary. This CIAA was identified because BLM is not only required to manage the physical remains of historic trials, but also the setting where it is an important aspect of integrity of the property (Appendix 5). Impacts to the historic trails within the RMPPA from management actions identified in Table 2-1 are presented in Section 4.13.14 above.

Development activities occurring on private and state lands with no federal jurisdiction would have the greatest cumulative impact on historic trails within the RMPPA. A large portion of the minerals activities analyzed above would occur on private and state lands, especially within the checkerboard landownership areas. These surface disturbing activities result in the damage or loss of both the physical remains of the historic trails and the integrity of the associated setting. Minimal cumulative effects to the historic trails are anticipated from activities on other federal lands, as all federal agencies are required to manage cultural resources by the National Historic Preservation Act.

Development activities occurring on private and state lands with no federal jurisdiction would also have the greatest potential for cumulative effects to the setting of the historic trails where the setting is an important aspect of integrity. Disturbance areas and facilities constructed on lands outside federal jurisdiction would alter the landscape surrounding the trails to the point that the integrity of the setting would no longer contribute to the trails' eligibility. The incremental damage and loss of integrity would result in the fragmentation of the trails and would destroy the values that make these resources significant. Large-scale and high-profile developments, such as wind turbines and communication towers, would also impact the integrity of setting, even from greater distances.

Under all of the alternatives, impacts to the historic trails would be avoided or mitigated by cultural resources management program actions and implementation of federal regulatory laws, actions, and guidelines designated to protect cultural resources. The greatest potential for impacts to the historic trails would occur under Alternatives 1 and 2 because of increased surface disturbance activities and limited protections as a result of a decrease in restrictions from other programs. The potential for impacts to the historic trails would be less under Alternative 3 because of increased restrictions placed on surface disturbance.

Paleontological Area—Como Bluff

The CIAA boundary for Como Bluff NNL includes the entire RMPPA because activities and resources occurring outside the RMPPA are not expected to affect SD/MA designations inside the RMPPA. Effects of BLM actions on lands administered by BLM within the RMPPA are presented in 4.13 above.

Overall impacts to the Como Bluff NNL from RMP alternatives range from significant to no impact, depending on whether a designation is being removed for a specific area in a specific alternative or the management of the area is adequate to protect relevant and important values.

The potential for cumulative impacts to the Como Bluffs NNL exists because large portions of the lands containing the NNL are private. Under all RMP alternatives, impacts to the paleontological resources of the Como Bluffs NNL would not be considered significant because of the policies associated with the paleontological resource management program, which would require identification and mitigation of paleontological resources before surface disturbing activities occur. No such protection exists for the private lands.

The largest area within the RMPPA containing other federal surface ownership is the Medicine Bow National Forest, the majority of which is located in the south-central portion of the RMPPA. Those portions of the Medicine Bow National Forest within the RMPPA comprise about 970,990 acres. In its 2003 Medicine Bow Revised Land and Resource Management Plan, the USFS recommended 27,963 acres of land to Congress for wilderness designation (in addition to its existing 78,850 acres of wilderness), designated 15,476 acres as Research Natural Area, designated 18,708 acres as a special interest area, and recommended 27.7 miles of portions of the North Platte and Encampment Rivers within the forest for designation as Wild and Scenic.

Cumulatively, preservation of these 62,147 acres (excluding WSR designations) within the Medicine Bow National Forest benefits the 375,050 acres of SD/MAs proposed on BLM lands within the RMPPA by enhancing wilderness values through protection of additional wilderness characteristics, complementing BLM's WSR recommendation on the Encampment River by recommending designation of additional areas along the Encampment and North Platte Rivers as Wild and Scenic, preserving and protecting areas of local interest through designation of special interest areas, and protecting areas that represent important natural ecosystems and environments, as well as special or unique scientifically important characteristics, through designation of Research Natural Areas.

SD/MAs designated for the management of wildlife, including WHMAs, fish habitat management areas, and raptor concentration areas, would be managed to ensure sufficient protection of the relevant and important values for which these areas were designated. Actions proposed by the WGFD, in coordination with BLM, would benefit these areas through habitat improvement projects, such as fence construction and modification and the restoration of native fish to traditional waterways. WGFD might also prescribe fire and modify existing grazing strategies for the benefit of wildlife. Overall, these actions would benefit wildlife, maintaining and enhancing the values of each wildlife SD/MA.

Potential cumulative affects from reasonably foreseeable development projects on state and private lands (mostly pipelines and wells associated with oil and gas development) would potentially occur to some SD/MAs. Cumulative impacts could include degradation of visual resources, soils, watershed resources, and vegetation caused by these development activities within and surrounding these SD/MAs. BLM restrictions on surface disturbance, such as in VRM Class I and II, preferred routes for ROWs, and areas of controlled surface use, would likely reduce possible effects; however, activities on state and private lands that might not be subject to restrictions could likely compromise relevant and important values for which the area is being managed as an SD/MA, depending on the location of private and state land and level of activity occurring on these lands.

Beneficial cumulative impacts would be the greatest under RMP Alternatives 3 and 4 as a result of the greatest amount of acreage designated as SD/MAs under these alternatives and the least amount of projected development activities. Adverse cumulative effects would be the greatest under Alternative 2

because it removes SD/MA designations on three SD/MAs within the RMPPA and allows the greatest amount of development activities with the least amount of restrictions.

Transportation and Access

The CIAA for transportation and access management consists of the entire RMPPA. Effects of actions on transportation and access on lands administered by BLM within the RMPPA are presented in Section 4.14 above.

Potential impacts to transportation and access would result primarily from various land use restrictions, such as sensitive resource and wildlife areas, VRM classification, and cultural resources that would limit public access and use within the RMPPA.

The majority of cumulative effects on transportation and access within the CIAA would also result from actions that would require land use restrictions. Various wildlife protections would potentially cause cumulative impacts to transportation and access by placing additional land use restrictions within the CIAA. All restrictions would reduce the potential for access easement acquisition and BLM-designated road development locations and limit access, resulting in overall negative cumulative effects within the CIAA. Effects would not be considered significant, however, because opportunities for access easement acquisition and BLM-designated road development and reasonable public access would still be available.

The potential for cumulative impacts would be greatest under Alternative 3 because of increased protection placed on sensitive resources. The most significant impacts would occur in areas designated as NSO and listed as avoidance or exclusion areas. Impacts would be lessened under all other alternatives because of fewer restrictions on seasonal access and road development.

Vegetation Management

The CIAA for vegetation is composed of the RMPPA as a result of the diverse and, in some areas, unique vegetation communities contained within. Effects of BLM actions on vegetation administered by BLM within the RMPPA are presented in Section 4.15 above.

Potential impacts to vegetation communities would result from surface disturbing actions that contribute to either short- or long-term loss of vegetation, and other actions that contribute to altering vegetation attributes through foraging, trampling, vehicle routes, dust, and application of vegetation treatments. Under all RMP alternatives, impacts to plant communities would not be considered significant; however, varying acreage of disturbance would occur, depending on the level of development activity projected. Such disturbances as roads, facilities, and well pads could potentially exist throughout the planning period; however, reclamation efforts would restore functioning plant communities. Weed invasion and spread would be significant.

BLM management actions, in addition to activities on other federal, state, and private lands, would primarily affect vegetation as a result of surface disturbing activities associated with mineral development, utility and transportation infrastructure and facilities, livestock range improvements, and OHV management. The differences in the projected amount of minerals related surface disturbance among the RMP alternatives (about 7,160 acres, which include private and state lands) would not affect the overall analysis of cumulative effects on vegetative resources within the CIAA.

Oil and gas development would cause the greatest amount of vegetation loss from the construction of roads, pipelines, and well pads, and the introduction and spread of noxious and invasive species. Areas of intense development would cause more localized impacts to vegetative resources. Overall, the amount of

disturbance is negligible compared with the amount of total vegetative resources within the CIAA and on public land because the majority of affected vegetation types are common and widely distributed throughout the region. Avoidance of disturbance in rare or more vulnerable plant communities would protect these sites on public land, but these sites would often not receive similar recognition and protection on private and state lands. Reclamation of construction disturbance in areas not required for long-term operation (i.e., roads and operational pads) and of abandoned well sites and roads would reduce the acreage of disturbance and return vegetation cover, initially dominated by grasses.

The implementation of BLM's Mitigation Guidelines, restrictions on surface use, implementation of Standards for Healthy Rangelands (USDI, BLM 1997), desired plant community objectives, and monitoring efforts would provide protection to vegetative resources on federal lands, and possibly lands with federal subsurface minerals. However, indirect impacts from dust and accelerated soil erosion would affect a greater number of acres than the direct loss of vegetation from surface disturbing acres. Dust is carried in the wind from 1/4 mile to several miles, coating the vegetation and reducing growth rates, palatability, and use patterns by livestock and wildlife. Although these effects do not last long, repeated events occur many times annually. Accelerated soil erosion is created by most road systems because water collected by roads and passed through culverts is not spread out again, leaving concentrated volumes of water to widen and deepen downstream channels. Gradient adjustment in lateral channels leads to increased water runoff and soil erosion, reduced moisture for plant growth, and eventual desertification as sites dry out and vegetation production and cover decrease. In addition, lack of requirements for road-building criteria, reclamation, and weed control on private and state lands would promote increased erosion, desertification, loss of vegetation cover and production, and proliferation of weeds which, in time, would also affect adjacent public lands and lead to the decline in vegetation health, cover, and diversity.

Utility, transportation, and pipeline projects, particularly when condensed to corridors, tend to have fewer direct and indirect impacts to vegetation. Although road systems result in loss of vegetation, the construction and reclamation practices usually result in minimal long-term impacts from projects. Power lines, pipelines, and other activities that are primarily revegetated in the short term through reclamation alter plant cover, species, and structure, but return to normal functioning communities in the long term.

Effects on vegetation from livestock grazing management and range improvements are considered minor compared with those of oil and gas development, in terms of acres of vegetation altered through surface disturbing activities, such as construction of reservoirs and pits. Livestock grazing impacts nearly all rangelands within the RMPPA and, if managed correctly, would have minimal negative impacts. Cooperative efforts and other partners, such as conservation districts, the University of Wyoming extension service, Natural Resources Conservation Service, grazing boards, nonprofit groups, and industry organizations, all assist in promoting improved grazing practices and use of BMPs to minimize the negative impacts from grazing.

Vegetation treatments would also affect vegetative resources, primarily through changes in seral class structure to early stages dominated by grasses and forbs rather than through surface disturbing activities. Impacts are not likely to be significant because of the varied spacing of activities, except for weed proliferation and larger, block shaped treatments on private and state lands with more areas converted to grass production for livestock use. However, treatments, along with reclamation activities, would increase grass and forb dominated plant communities in the long term because of the slow recovery in native shrub communities (e.g., sagebrush) that require more than 50 years to reestablish to predisturbance conditions. Effects from vegetation treatments would include a short-term increase of early successional species and a short-term decrease in vegetation production. Long-term effects, however, would improve overall vegetative community diversity through an increase in grass species, plant diversity, cover and age class structure, and multiseral plant communities.

OHV management would contribute to increased acreage of vegetation affected by surface disturbing activities associated with vehicle use. Areas managed for existing roads and vehicle routes would still contain locations on steep slopes and sensitive soils that create or expand gullies and accelerated erosion and reduction in vegetation cover and production, particularly in intermingled and checkerboard land patterns that complicate surface management. These areas, in addition to increased OHV use, would also contribute to establishment and spread of noxious and invasive weed species.

Special Status Plant Species, under the ESA and Wyoming BLM sensitive species guidance, and unique plant communities would be protected on federal lands by site-specific mitigation, including exclusion or avoidance of all surface disturbing activities; however, protection on private and state lands might not occur, resulting in potentially significant impacts.

Existing locations of noxious and invasive weed species would continue to expand, particularly Russian knapweed, leafy spurge, and saltcedar along the North Platte River, halogeton in oil and gas development areas, and cheatgrass in the Laramie Range. With increases in surface disturbing activities associated with minerals development and high wildland fire potential in the Laramie Range, the acreage of these weed species would become greater with reduced diversity and production of native plant species. In addition, there is a high potential for establishment and spread of new weed locations from new highway and road systems, which allow for expanded industry and public travel across the country, and the amount of surfacing disturbing activities. On the other hand, cooperative efforts with county weed and pest districts, conservation districts, private landowners, and industry are becoming more engaged and effective in identifying locations and applying appropriate measures to control and eradicate weed populations. Continuation of these efforts would assist in addressing the noxious and invasive weed problems, but they would continue to expand and reduce vegetation species diversity, cover, and production.

Visual Resources

The visual resource CIAA consists of the entire RMPPA. Effects of BLM actions on visual resources within the RMPPA are presented in Section 4.16 above.

Cumulative actions that could affect visual resources include oil and gas development, wind energy projects, power and pipeline projects, and communication towers. Oil and gas development, wind energy, and other surface disturbance activities, combined with the same or similar actions on state and private lands, particularly in the checkerboard and other intermixed land ownership areas, would result in cumulative visual impacts.

Wind energy projects, power and pipeline projects, communication towers, oil and gas development, and other surface disturbance developments would degrade the scenic quality of landscapes because of associated roads, barren ground, and facilities associated with industrial development. These impacts to visual resources would result primarily from surface disturbance combined with other industrial activities on both federal and nonfederal lands.

Current oil and gas development projects in the western RMPPA, such as Desolation Flats, Continental Divide/Wamsutter II, Hay Reservoir, Creston Blue Gap, Mulligan Draw, and the Atlantic Rim CBNG Exploration PODs, have had significant impacts on the visual quality of the landscape. Large portions of these developments, in addition to the non-mitigated developments within the private and nonfederal lands, particularly those in the checkerboard and other intermixed land ownership area, are dominated by roads, well pads, tanks, and drill rigs that destroy the natural character of the landscape.

Pending projects, such as CDC and Atlantic Rim, would further reduce visual resources in the Red Desert. Although CDC would be infill drilling in areas already heavily impacted by the visual intrusions

of oil and gas development, Atlantic Rim (270,000 acres) would create new intrusions in a largely undisturbed landscape. Much of the western edge of the project is visible from State Highway 789, so visual impacts are readily visible to a large number of visitors from numerous key observation points.

WGFD has several projects underway that would improve wildlife habitat. These include vegetation treatments, livestock grazing management, and native fish restoration. All of these projects, when combined with similar BLM actions on federal land, would help improve the quality of the habitat and visual resources.

Many of the LSRCD projects improve the health of rangelands, fisheries, and wildlife habitat. These projects include the Muddy Creek Water Storage Reservoirs; Wetlands Development Expansion; Stock Water Developments; rangeland enhancements, improvement, and treatment; Savery Creek fisheries enhancement; Battle Creek Fisheries Enhancement; and vegetation management. All of these projects, combined with BLM actions, would help expand and increase the vigor and cover of the vegetation resources, which would enhance the visual resources in the LSRCD area.

Medicine Bow National Forest actions also provide visual settings in the CIAA. The USFS WSR recommendations for the Upper North Platte River and portions of the Encampment River prohibit most human impacts. The Forest Land RMP also includes a recommendation for designation of the Encampment River Wilderness Area, further protecting the viewshed above BLM's Encampment River WSA and potential WSR. BLM, WSA, WSR, and VRM management actions, in combination with the USFS Wilderness and WSR management actions, would have the greatest potential of cumulative effects to the setting of primitive, naturalness, and scenic values, which are important criteria for visual resources.

Development activities occurring on private and state lands with no federal jurisdiction would have the greatest potential for cumulative effects to the natural setting of the landscape. Large-scale and high-profile developments, such as wind turbines and communication towers and disturbance areas, would impact the integrity of setting. In combination with these, some large-scale developments constructed on lands outside federal jurisdiction would alter the landscape surrounding these sites to the point that the development would exceed the prescribed VRM objectives. The incremental damage and loss of the visual integrity would result in a landscape altered from a natural setting to an industrial setting.

Under all of the alternatives, impacts to visual resources would be avoided or mitigated by visual resources management program actions, SD/MA actions, and through BMPs and conditions of approvals prescribed to protect visual resources. The greatest potential for impacts to visual resources would occur under Alternative 2 because of increased surface disturbance activities, regression of Class II areas, and limited protection to visual resources as a result of a decrease in restrictions from other programs. The potential for impacts to visual resources would be less under Alternative 3 because of increased restrictions placed on surface disturbance.

Water Quality, Watersheds, and Soils

The CIAA used to analyze cumulative impacts for soils is the RMPPA. The CIAA for water quality and watershed resources extends beyond the RMPPA following watershed boundaries for the North Platte (1018), South Platte (1019), Great Divide—Upper Green River (1404), and the White-Yampa (1405) USGS subregions (4-digit HUCs) (Map 4-1). Appendix 11 describes catalog units within the above subregions. These watersheds were used as the basic unit of analysis because impacts from management actions proposed under the RMP and other existing activity plans are not expected to have cumulative, hydrologic influence beyond this scale. Given that hydrologic influence is primarily focused in the stream channels and that delineation of the CIAA was based on watershed boundaries, the area of analysis is

sufficient. Effects of BLM actions on watershed resources administered by BLM within the RMPPA are presented in 4.17 above.

Potential, cumulative impacts to water quality, watershed, and soil resources would occur from a combination of activities and land uses occurring within the CIAA. Activities on federal, state and private lands, such as road, well pad construction, urbanization, industrial uses, logging, livestock trailing, OHV use, and recreational use would disturb soils, remove vegetation, cause soil compaction, and increase overland flows. Such activities result in increased compaction, reduced infiltration, accelerated soil erosion, and runoff, which increase sediment, salt, and nutrient loads to stream systems and can lead to channel destabilization in some locations. Land management decisions on BLM and other federal, state and private lands would likely result in changes in water quality beyond designated uses in some locations within the CIAA. The following are the potential impacts for each of the CIAA subregions (Map 4-1).

North Platte (1018): The headwaters of the North Platte are primarily within the Medicine Bow National Forest and Colorado. The North Platte receives transbasin contributions of water from the Colorado River system and is regulated by the Seminoe, Kortes, and Pathfinder dams. The development of the Carbon Basin Coal Lease near Elk Mountain is expected to disturb 288 acres per year and a total of 4,896 acres. Once started, mining will take place during the course of 11 years, with reclamation activities occurring during and following mining activities. Impacts to water quality would potentially occur in groundwater resources from dewatering operations and from increased sediment loads caused by surface disturbance. These operations would be regulated through the Wyoming DEQ and, therefore, impacts to water supplies are unlikely. The North Platte at Seminoe is classified as 2AB by the Wyoming DEQ, which protects the water quality to drinking water and game fish designated use standards. Class 1 waters below Kortes Dam are protected for a blue ribbon trout fishery, the Miracle Mile. If management actions outside BLM's control were to create conditions where water quality constituents exceeded these standards on a regular basis, the state would list the reach on the State 303d list as threatened or impaired. Water quality in the North Platte at Seminoe is probably degraded somewhat from past mining activity, irrigation, and municipal outfalls in addition to the surface disturbance activities described here.

- **Great Divide—Upper Green River (1404)**—The Great Divide Basin in the Great-Divide—Upper Green River sub-unit is influenced by oil and gas and potentially increased uranium exploration and development in the Rock Springs and Lander Field Offices, as well as private land. A uranium processing plant is located northwest of Rawlins; if it were to begin operations, water resources may be impacted by groundwater withdrawals and, potentially, surface features such as processing ponds and surface discharge. BLM-approved uranium mining activities along with State of Wyoming approvals would potentially include in situ projects (Section 4.17); these activities, along with processing facilities, would likely have impacts to surface and groundwater.

- **White-Yampa in the Colorado River Basin (1405)—**Muddy Creek and Savery Creek drain into the Little Snake River, which is in the White-Yampa subregion; this system is largely unregulated, with smaller dams in the headwaters (High Savery Dam) and off-channel reservoirs downstream. Water development in this watershed by Wyoming and Colorado is expected to continue (Roehm 2004). State of Wyoming water development projects, along with BLM management actions, are likely to lead to both localized and basin-wide changes in flow conditions and depletions, by attenuating peak flows and increasing consumptive use. Attenuating flows means to flatten out the hydrograph, i.e., storing water in reservoirs during storm events and releasing water during low-flow conditions. Attenuated natural flow conditions have the potential of influencing water quality, channel dynamics, and life history requirements for fish species. Impacts would be closely related to how and when these flows become attenuated, and downstream impacts to ESA-listed species would be or have already been considered in

watershed planning (Roehm 2004). Flows are also attenuated and water consumptively used for private land irrigation and transbasin water diversions, such as the Cheyenne Stage I and II projects.

- **South Platte (1019)—**Only a small amount of the RMPPA is located within the South Platte Basin, and impacts from BLM management actions would be insignificant when compared to water and soil resource impacts caused by urbanization along the Front Range of Colorado, Cheyenne, and other population centers. Private land management decisions dominate the eastern portion of the field office because of the preponderance of private landownership (Map 1-2: Surface Ownership/Land Status). However, federal mineral estate (Map 1-3: Federal Subsurface Ownership Designations) and livestock management decisions on federal, state, and private lands would likely lead to non-point source water quality impacts in locations such as the Crow Creek drainage, which is listed on the 303d list for bacteria (Appendix 11 and 13).

BLM-authorized activities, along with other federal, state, and private land use decisions, combined with increases in mineral development, urbanization, recreation, and livestock grazing, would potentially degrade water quality beyond the designated use of receiving waterbodies in some locations of the CIAA, thereby resulting in water quality changes likely beyond designated uses in some locations. Mitigation and BMPs as a result of state and federal regulation would moderate water quality degradation and prevent this degradation when possible.

Conventional oil and gas and CBNG development activities on federal, state, and private lands, and urbanization on private lands, would be the primary causes of surface disturbance to soil changes in water quality under all alternatives. More than half of the oil and gas development is expected to be located on state and private lands, but may still be within BLM-administered subsurface (Table 4-7).

Mineral development activities and construction of livestock water developments, along with other activities, would deplete water from the Colorado River and Platte River drainages. Recovery programs or interagency agreements designed to protect T&E species outside the RMPPA would mitigate depletions for the Colorado River downstream of the confluence of Muddy Creek and the Little Snake River in accordance with the recovery program described in Appendix 11. These depletions would change the nature of stream flows, which could alter channel dynamics and cause overall degradation of the riparian corridor. Furthermore, wildlife and fish species not identified under ESA for protection would potentially be impacted by changes in stream flow in these systems.

Impacts to groundwater quality would depend on the quality and maintenance of oil and gas development wells on federal, state, and private lands and the overall level of activity that would occur. Even with proper oversight by BLM and the WOGCC, improper casing and cementing of wells, undetected spills, or leachate from produced water pits could introduce contaminants into the groundwater. Existing development, combined with reasonably foreseeable development, would increase the potential for such impacts.

Cumulative impacts would likely be greatest in the Colorado River Basin and in the North Platte subregion above Seminoe Reservoir as a result of minerals development and surface discharge of produced water, combined with other surface disturbing activities. Cumulative impacts would also likely increase in the eastern portion of the CIAA in the North Platte and South Platte subregions as a result of the amount of land under private ownership and potential population growth in these areas. Although existing and future activities on these lands is not well known, it is assumed that surface disturbing activities (e.g., mineral development and general construction) would occur. Because private landowners and, in some cases, state lands are not required to implement the same level of mitigation and protection measures as BLM, impacts to soils and watershed resources could be higher on private or state lands.

Specifically, discharging produced waters into ephemeral drainages from private or state leases or not adequately considering water treatment options for produced water disposal in the North Platte or White-Yampa subregions could result in significant impacts.

Cumulative impacts of aquifer depletion during the production of CBNG from federal, state, and private wells would result in a permanent loss of these water resources. Although this would result in an irreversible and irretrievable commitment of these resources, the depths of many of these formations (1,000 to 10,000 feet) make the practicality of the use of these resources in the future unlikely. However, lowering the water table and pressure in these CBNG formations would potentially impact artesian water resources dependent on these resources. Typically, these formations are nontributary to surface waters, but can be connected to surface waters through springs along faults or where they outcrop. During site-specific project planning, water quality, isotopic analysis, and/or groundwater modeling would be used to evaluate this potential, and decisions would be made to protect surface waters as appropriate.

Impacts from surface disturbing activities, water developments, and surface discharges from CBNG development could result in degradation of water quality beyond the designated use of receiving waterbodies in the White-Yampa subregion and, potentially, in the North Platte subregion (depending on development strategy selected at the activity planning level). These significant impacts would occur under all alternatives. Surface disturbing activities would result in significant impacts to soils under all alternatives because soil loss (locally and regionally) would exceed natural levels of top soil regeneration estimated at 2 tons per acre.

Cumulative impacts would be greatest under Alternative 2 because of anticipated increases in development, as well as fewer restrictions on such activity. Under Alternative 3, increased restrictions on development, recreation, and livestock grazing would reduce the potential for surface disturbance and subsequent increases in erosion, runoff, and sedimentation of surface waters. Alternative 4 would result in fewer impacts than Alternative 1 and 2 and more impacts than Alternative 3. This is attributed to surface disturbing activities and water disposal alternatives for oil and gas development activities.

Wild Horses

The CIAA used to analyze cumulative impacts on wild horses includes the HMAs within the RMPPA and those HMAs that are adjacent to and comprise the meta-populations of RFO (Map 4-2). The HMAs included in the CIAA that make up the Red Desert meta-population include Stewart Creek, Lost Creek, Divide Basin, Antelope Hills, and Green Mountain HMAs. Those HMAs that make up the state line meta-population are Salt Wells Creek, Adobe Town, and Sand Wash Basin. This area was selected because of the amount of interaction that takes place between HMAs within the larger meta-population. Effects to wild horses from the RMP alternatives are presented in Section 4.18 above.

Potential impacts to wild horses would result primarily from surface disturbance actions. Under all RMP alternatives, impacts to wild horses would not be considered significant; however, varying degrees of disturbance would occur depending on the level of development activity projected for each alternative. Actions that increase human presence (e.g., recreation and increased travel) would cause impacts to wild horses.

The majority of cumulative effects on wild horses within the CIAA would result from surface disturbing and disruptive activities on federal lands that would alter the wild and free-roaming nature of horse populations. Considerable existing and future oil and gas development projects are reasonably foreseeable within the RMPPA. Increasing development and recreation activities, along with the existing livestock and wildlife uses, would cause soil disturbance, remove vegetation, degrade and reduce available forage, increase human presence, and disturb and displace wild horses and diminish their wild, free-roaming

nature. This effect would be in proportion to the increased development and would vary by HMA. The impacts to vegetation are not anticipated to be significant as a result of the small amount of vegetation actually removed by development activities and attendant mitigation/reclamation requirements. Impacts stemming from competition with livestock, wild horses, and other wildlife over forage and water resources are expected to be mitigated by the Standards for Healthy Rangelands (USDI, BLM 1997) and Guidelines for Livestock Grazing. The impacts to the wild, free-roaming nature of the horses would range from minimal in the Stewart Creek and Lost Creek HMAs, assuming the limited foreseeable oil and gas development in these areas, to significant in portions of the Adobe Town HMA and would require reevaluation of the suitability of those portions of the Adobe Town HMA to remain in the HMA, thereby potentially effecting a reduction in the AML for the HMA.

Cumulative impacts would likely be greatest under Alternative 2 because of anticipated increases in development and livestock grazing, as well as fewer restrictions placed on such activities. Under Alternative 3, increased land use restrictions and less development would reduce the potential for surface disturbance and vegetation removal. Under Alternative 1, cumulative impacts to wild horses are not considered to be significant. Under Alternative 4, the impacts would be slightly greater than under Alternative 1, but greatly reduced compared to Alternative 2.

Wildlife and Fish

CIAAs for effects to wildlife and fish vary by species. The CIAAs for bighorn sheep, elk, mule deer, and pronghorn are composed of the HMAs for each species that either fall completely within the RMPPA or both within and outside the RMPPA (Maps 4-3 through 4-6). CIAAs for the greater sage-grouse, raptors, Special Status Species, and all other wildlife and fish species are the RMPPA. Effects of BLM actions on wildlife and fish and associated habitat administered by BLM within the RMPPA are presented in 4.19 above.

The majority of cumulative impacts on wildlife habitat within all the CIAAs would result from surface disturbing and disruptive activities, such as mineral development and associated wells, roads, pipelines, and facilities, livestock grazing, range improvements, and others (e.g., geophysical exploration) on private, state, and other federal lands within the RMPPA. Effects would result in habitat fragmentation and animal displacement (short term or long term), depending on the amount, location, and timing of activities. All effects would depend on the amount and timing of activities and whether the amount of activity within each CIAA outpaces the success of reclamation and revegetation efforts in disturbed areas. Loss of vegetation attributed to development activities would result in a reduction in available habitat and quality of habitat, which would increase forage competition among grazing animals. Habitats might be made unavailable to wildlife because of human disturbance factors (e.g., traffic, noise, or increases in livestock during sensitive time periods such as winter, migration, transitional, birthing, nesting, and early rearing of young). Impacts to wildlife would potentially be significant if activities are concentrated in areas of sensitive wildlife habitat, and/or if increased development and surface disturbance alter existing migration corridors to the extent that access to important habitat areas is greatly reduced.

BLM coordination with NRCS and LSRCD on projects would ensure that construction of range improvements and vegetation manipulation projects would strive to maintain rangeland health standards. These projects, including storage reservoirs, wetlands development and expansion, stock water developments, rangeland enhancements, fisheries enhancement, and vegetation manipulation (Table 4-7) initiated on BLM or non-BLM lands would be designed in conjunction with BLM-initiated projects (Appendix 19) to maintain and enhance the quality of wildlife habitat. Water development projects designed for livestock and wildlife needs would continue to support the diversity of species which inhabit the RMPPA. Some of the developments would be fenced to preclude livestock use. These developments would create wetland habitat for waterfowl nesting and brood rearing. These types of developments

would be large enough to sustain water levels during drier periods, supporting wildlife and providing offsite water for livestock.

BLM coordination with WGFD on projects would ensure that construction of range improvements and vegetation manipulation projects would strive to maintain rangeland health standards. These projects including, fence modifications, fence construction, vegetation treatments, wildlife transplants, livestock grazing management, and habitat treatments on private lands (Table 4-7), initiated on BLM or non-BLM lands, would be designed in conjunction with BLM-initiated projects (Appendix 19) to maintain and enhance the quality of habitat. Construction of new fences or conversion of existing fences to allow for wildlife passage within migration corridors, across all ownerships, and developed in coordination with the WGFD, would decrease wildlife energy loss and stress, injury, entanglement, and mortality.

BLM-initiated vegetation treatments in the form of chemical/biological treatments when combined with similar activities occurring on USFS and WGFD lands would alter wildlife habitat. Actions would reduce the amount of decadent vegetation, improve the quality of forage, enhance the vegetation mosaic related to age and successional stages, and diversify habitat types available to wildlife.

Untreated weeds on non-BLM lands that spread to adjacent BLM lands would result in degradation of native habitat. Weed treatments on non-BLM lands which are intermingled with BLM lands are the responsibility of the private landowner or lessee. Coordination with non-BLM landowners in the development and application of weed treatments would assure that weeds are identified and treated on all ownerships to maintain productivity of native vegetation, which comprises important wildlife habitats.

BLM, county fire departments, NRCS, and WGFD would work cooperatively to design fire and fuels management actions to manipulate vegetation in a more controlled manner to decrease the potential for catastrophic wildland fires. Coordinated suppression would limit wildland fires to the smallest acreage possible. This would greatly reduce the potential for wildland fires that remove vegetation cover and associated wildlife habitat.

BLM, USFS, USFWS, WGFD, and LSRCD are party to Colorado River Cutthroat Trout recovery efforts. Joint actions would contribute to the reintroduction and recovery efforts of the fish into historic ranges. BLM, USFWS, and WGFD are party to Wyoming toad and non-game sensitive fish recovery efforts. Joint actions that contribute to reintroduction and maintenance would increase the distribution of rare and unique species, reduce the potential for catastrophic loss of the species, and increase populations so as to ultimately remove species from endangered status. Cooperation between BLM, USFS, USFWS, WGFD, and private landowners would continue to transplant bighorn sheep into once historic ranges to reduce the risk of disease transmission from contact with domestic sheep.

The WGFD “Access-Yes Walk In Areas and Hunter Management Areas” program, which provides access to private land when combined with BLM access and opportunities, would allow for improved access to both BLM lands and adjacent private lands that are enrolled in the program. In habitat areas with intermingled land ownership patterns, this program would distribute hunting pressure over larger areas, making them more desirable destinations, and reduce the amount of surface disturbance.

Areas with intermingled private land ownership would have the potential for urbanization. Any coordinated management that maintains the viability of wildlife habitat and grazing land reduces the likelihood that these areas would be sold for non-agricultural purposes.

Potential significant effects to big game habitats from activities on private or state lands would be likely because they are not afforded the same protections as habitat on BLM lands. One exception is WGFD’s management and designation of WHMAs where wildlife populations and habitat (in coordination with

BLM as necessary) are managed for the protection and benefit of wildlife. The potential also exists for long-term disruption of migration corridors as a result of proposed pipelines and right-of-way corridors between key habitats within the CIAA.

Water development in the Upper Colorado River Basin is expected to continue (Roehm 2004). State of Wyoming water development projects along with BLM management actions are likely to lead to both localized and basin-wide changes in flow conditions and depletions by attenuating peak flows and increasing consumptive use (e.g., private land irrigation and transbasin water diversions). Attenuated natural flow conditions have the potential of influencing water quality, channel dynamics, and life history requirement for fish species. Impacts would be closely related to how and when these flows become attenuated, and downstream impacts to ESA-listed species would be or have already been considered in watershed planning (Roehm 2004).

RMP alternative impacts to wildlife and fish habitat vary by alternative; however, the majority of impacts would be considered moderate as a result of actions such as fire and fuels, forestry, and lands and realty management; minerals development; OHV use; and livestock grazing that would result in the loss, alteration, and fragmentation of habitats and displacement of wildlife. Alternative 2 would result in the greatest effects to wildlife that live in areas allowed the greatest amount of development and given the least amount of protections. Alternative 3 would result in the least amount of impacts, as it includes the least amount of development and the greatest level of protection. Alternative 4 would be similar to Alternative 1; however, Alternative 4 would include additional timing restrictions and surface protection measures that would protect wildlife and associated habitat by reducing the loss, alteration, and fragmentation of habitats and displacement of wildlife.

4.21 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Section 102(2)C of NEPA requires a discussion of any irreversible or irretrievable commitment of resources which would occur should the proposed plan or alternatives be implemented. Definitions of irreversible commitment of resources include: An irreversible commitment of a resource is one that cannot be reversed (e.g., the extinction of a species, disturbance to protected cultural resources, or extraction of fossil fuels); irreversible commitments of resources are actions which disturb or remove either a non-renewable resource or a renewable resource to the point that it can only be renewed over a long period of time (centuries); a resource is irreversibly committed when a decision or action alters the resource so that it cannot be restored or returned to its original or predisturbance condition; and, the resource or its productivity or its utility would be consumed, committed, or lost forever. Definitions of an irretrievable commitment of resources include: An irretrievable commitment of a resource caused by a management action or land use decision is one that directly removes the resource from availability or that renders its productivity or utility lost for a period of time (e.g., closure of an area to resource extraction); an irretrievable commitment is the loss of opportunities for production or use of a renewable resource for a short to medium period of time (years); or, a resource is irretrievably committed when a decision results in the loss of production or future use of the resource. It is not so much the exact interpretation or use of the terms that is important as it is an understanding that multiple use decisions eventually made in the Rawlins RMP would commit resources either permanently or for a long period of time and, in some cases, preclude use or opportunity by future generations.

Under the proposed plan and alternatives in the RMP, resource commitments are considered irretrievable until or unless the plan is revised or amended at some later date. The decisions in the RMP constitute a commitment of resources that are, in many cases, irretrievable under the plan. The value of the resource is reduced, diminished, or eliminated for the life of the plan. Any renewable resource, vegetation community, wildlife population, or even soil productivity can be considered retrievable given enough time, ingenuity, and effort. Reclamation techniques known or yet to be perfected can return most rangelands to productive, healthy, diverse, functioning systems. Other than the removal of forest overstory through timber harvest, the recovery of most vegetative communities would take decades, not centuries; therefore, they would be considered retrievable. This is certainly the intent of the overall goals and objectives of the RMP FEIS. Therefore, the consideration of irreversible and irretrievable commitment of resources is confined to those land use decisions that eliminate future options for use of the various resources managed within the RMPPA.

The Rawlins RMP resource allocation decisions would result in both irreversible and irretrievable commitment of resources. For example, in the exploration and development of the fluid mineral resources from the public lands, the removal of oil and gas from subsurface reservoirs would be an irreversible and irretrievable commitment of resources. While the oil and gas is irreversibly removed from the ground, it is also irretrievably committed when it is burned to produce electricity, heat homes, or propel vehicles. The decision to explore and develop fluid mineral resources in the RMPPA is an irreversible and irretrievable commitment to utilize the fluid mineral resources today and forego potential use of the resource at some undetermined future time. Other extractive mineral resource uses would similarly be considered both irreversible and irretrievable commitments of resources.

Surface disturbing and disruptive activities associated with mineral extraction and energy development alter soil characteristics, have the potential to damage cultural and paleontological resources, and reduce the quality of, or remove, vegetation. Slight increases in sediment, salinity, and non-point source pollution might result in an irretrievable degradation of water quality from these activities. Wildlife dependent on the affected habitats would be displaced, and populations would be reduced as carrying capacity of the

range is reduced. Irretrievable losses of wildlife habitat indirectly reduce the amount of suitable Special Status Species habitat. However, management prescriptions and mitigation measures prescribed under the Proposed Plan and alternatives are intended to reduce the magnitude of these impacts and would restore some of the soil, vegetation, and habitat lost. Construction of roads, well pads, and other transportation infrastructure improvements create an irretrievable loss of habitat and impair important visual elements. Lands occupied by mineral extraction infrastructure would irretrievably reduce habitat value, reduce carrying capacity for wildlife resources, and reduce the quality of recreational activities on these lands during the life of the plan or during project life. Stand-replacing fires may cause an irreversible loss to some key ecosystem components. Authorized uses of the public land under the proposed plan and alternatives (because of the time element considered in the description of irretrievable commitment of resources) that disturb soil, remove vegetation, and affect wildlife habitats, are considered an irretrievable commitment of resources. In the extreme long term, however, many of these resource commitments are retrievable.

There are numerous resources, both natural and modified, that would be expended in the construction and operation of various facilities authorized by the proposed plan and alternatives. These resources include the building materials used in construction of projects, energy in the form of natural gas, petroleum products, and electricity consumed during construction and operation of various authorized uses on the public land. These resources, once expended, are irretrievably committed because their reuse for some other purpose would be impossible or highly unlikely. This also includes the future commitment of resources necessary for reclamation to return the public land productivity and diversity to predisturbance levels.

4.22 UNAVOIDABLE ADVERSE IMPACTS

Section 102(C) of NEPA requires disclosure of any adverse environmental effects that cannot be avoided should the proposed action or alternatives be implemented. Unavoidable adverse impacts are those impacts that remain following the implementation of mitigation measures or adverse impacts for which no mitigation measures exist. Unavoidable adverse impacts would occur as a result of activities and uses authorized during implementation of the RMP. Others are a result of public use of BLM-managed lands within the RMPPA.

Continuing to allow surface disturbing and disruptive activities as required by BLM multiple-use mandates would result in unavoidable adverse impacts. Although these adverse impacts are mitigated to the extent possible, unavoidable damage to natural resources is inevitable. Temporary, short-term, and long-term loss of vegetation caused by land uses, such as transportation or energy development, reduces the quantity and quality of vegetation resources. Energy and mineral resource extraction and energy facility placement on public land creates visual intrusions, reduces the quality of recreational experiences, increases soil erosion and soil compaction, and degrades water quality. Although these adverse impacts are unavoidable, they are primarily concentrated in areas of high and moderate oil and gas potential. Many of these areas are already disturbed, which slows the spread of impacts to more remote or less frequented areas. Under the proposed plan and alternatives, recreation use would be shifted from the high and moderate oil and gas potential areas to areas of the RMPPA not experiencing energy development activities.

Because large areas of crucial big game habitat coincide with known areas of high and moderate oil and gas potential, impacts to crucial habitats would be unavoidable under current BLM policy to foster oil and gas development. However, productive oil and gas well sites and their associated infrastructure would be mitigated to the extent possible to minimize wildlife habitat fragmentation and avoid the most significant wildlife habitat values. Unavoidable adverse impacts to wildlife and wildlife habitat include reduction in quantity and quality of wildlife habitat caused by oil and gas roads, facilities, engine noise, and human activity. This impact would occur for the life of the plan and beyond in many project areas.

Some competition is anticipated for habitat resources between wildlife, livestock, and wild horses. The extent of competition for habitat and forage would vary by season and drought cycle. Although there may be short-term periods of significant impacts, long-term management would ensure that these uses are compatible to the extent possible.

Inadvertent damage to or loss of cultural or paleontological resources from increased public visitation and increased authorized surface disturbing and disruptive activities is unavoidable. Although mitigation measures could be implemented for scientific data recovery, the impacts to the area of excavation would be unmitigatable. The number of sites anticipated to be inadvertently damaged is unknown, but is directly proportional to the acreage disturbed.

Conflicts between recreational use types (primitive, non-motorized use, vs. motorized use) which share recreational use areas would lead to unavoidable adverse impacts. Portions of the resource area with more intense motorized recreational use would continue to experience unauthorized off-highway use, increased soil erosion, and loss of vegetation. As motorized recreation demand increases, primitive recreational uses would disperse to other areas of the RMPPA or leave the RMPPA entirely.

Numerous land use restrictions imposed throughout the RMPPA to protect sensitive resources and other important values, by their nature, would affect the ability of operators, individuals, and groups who use the public lands to do so freely without limitations. Although attempts are made to minimize these

impacts by limiting protection measures to only the level necessary to accomplish management objectives and by providing alternative use areas for impacted activities, unavoidable adverse impacts would occur.

4.23 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Section 102(C) of NEPA requires discussion of the relationship between local, short-term uses of man's environment and the maintenance and enhancement of long-term productivity of resources. As described in the introduction to this chapter, "short-term" impacts are defined as anticipated to occur within 1 to 5 years of implementation of an authorized activity. "Long-term" impacts are defined as following the first 5 years of implementation but within the life of the RMP. However, under the RMP FEIS, short-term uses of the natural resources in the RMPPA can occur at any time during the life of the Rawlins RMP. Any management action or use authorized under the RMP includes appropriate mitigation measures and BMPs necessary to reduce the long-term impact of the action. Therefore, the long-term productivity of the resource is sustained within the context of the multiple-use management of the RMP.

Trade-offs between a permitted short-term use of resources and the maintenance or enhancement of resources (primarily renewable resources) in their natural, most productive condition are made each time a land use or resource use is approved. In the context of multiple-use, these trade-offs do not result in a maximization of either resource use (extractive uses) or in a maximization of resource protection or preservation. The goal of the RMP is to allow appropriate use of the natural resources while maintaining the long-term productivity of those resources.

Management actions and uses authorized under the RMP during implementation of the proposed plan or alternatives would result in various short-term effects, such as increased localized soil erosion, vegetation damage or loss, decreased visual resource quality, increased noise, and reduced recreational quality. Surface disturbing and disruptive activities, including mineral and energy development, dispersed recreation, livestock grazing, and infrastructure development, would result in the potential for loss in long-term productivity. Mitigation measures and best management practices would minimize the effect of short-term uses on long-term productivity. However, because BLM lands are managed to foster multiple-use, some reduction in long-term productivity would occur regardless of management approach.

Short-term oil and gas development and other extractive industry actions occurring throughout the life of the RMP could decrease the extent and productivity of crucial big game ranges, available livestock and wild horse ranges, and Special Status Species habitats. Resource roads, mineral resource facilities, and human activity associated with development would cause the greatest reduction in long-term productivity and use. However, mitigation measures associated with productive oil and gas well sites and their associated infrastructure would minimize fragmentation of habitat and reduce the long-term loss of wildlife habitat value. In addition, reclamation actions to replace or improve disturbed soil, water quality, riparian areas, vegetation, and habitat resources would reduce the loss in long-term productivity of wildlife and Special Status Species habitats throughout the RMPPA.

The RMP goals, objectives, and management actions for minerals, lands and realty, and transportation and access would result in the presence of facilities, infrastructure, sounds, and human activity that invariably would retain some areas in, and transform others into, more of an industrial area than a pristine, natural landscape. This potential influence caused by short-term development and resource extraction activities would modify the perception of the area as a natural, pristine landscape to a more developed setting that would make the area less appealing to most visitors. In areas of development, these actions would constrain the maintenance and enhancement of the long-term productivity of the natural landscape in the RMPPA. Long-term productivity of natural resources would be maintained or enhanced in areas where development potential is limited by the lack of extractive resources or by management actions that preclude development.

Short-term uses of the non-renewable resources during the life of the RMP would limit the long-term productivity of mineral resource extraction at some point in the future. Oil and gas and other mineral resources are finite in size and extent and, once depleted, would not contribute to the national long-term productivity or production and use of the resource. However, no mineral resource reserves within the RMP are anticipated to be exhausted during the life of the plan.