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 2.8. 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) states 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 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 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. While impacts may be perceived as positive (beneficial) or negative (adverse), those determinations are left for the reader of this document to decide. 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 the 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 multistate 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:

- 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 the federal mineral estate underlying federal lands administered by other federal agencies.
- A collaborative and multijurisdictional 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 be focused on the relative values of resources and not exclusively 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 Fish and Wildlife Service (FWS) will be in accordance with the 2000 BLM/FWS 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 (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

Because this analysis is qualitative, there are limited significance criteria that can be used. However, if and when specific activities are proposed at the implementation stage requiring quantitative analysis, 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)
- Federal guidelines for visibility impairment and/or atmospheric deposition.

For this qualitative analysis, only a general statement about NAAQS and WAAQS can be made. 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. This approach was used because (1) sufficient specific data were not available on future projects, (2) limited time was available to complete the analysis, (3) quantitative analysis will be required as development projects are defined in the future, and (4) 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 more detailed justification and a detailed list of all assumptions used in this impact assessment are 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, the short-term impacts, and the long-term impacts. It is assumed that all, if any, emission growth will be constant and linear in time. The inventory time frames are—

- 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 (or 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 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 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 be minor sources of air emissions.

Figures 4-1 through 4-4 provide a summary of potential oil and gas wells for all the alternatives. These are the total number 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 through 4-20 present emission calculations for all alternatives. The base year (or base) 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 through 4-20). As shown in Figures 4-9 through 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 through 4-8 and is shown in Table 4-1 and Figures 4-21 through 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 best available control technology. Impacts on visibility and atmospheric deposition could be mitigated by reducing emission of fine particulate matter, nitrogen oxides, and volatile organic compounds. 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

Because this air quality analysis is qualitative, specific impacts of resource activities on air quality cannot be made. However, it is BLM's judgment that several of the resources areas listed below (Cultural Management, Paleontology, Socioeconomics, Special Management Areas (SMA), Wild Horses, and Wildlife and Fish) will have only minor or negligible impacts on air quality.

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 likely add to the knowledge base upon which future air-related decisions would be made.

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

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 wind conditions. In addition, particulate emissions, CO, nitrogen oxides (NO_x), and hydrocarbons (VOC) (which include HAPs) would result from use of heavy equipment during fire suppression activities. (Recent studies have suggested that mercury can be released from fire activities). Emissions

would be generated from internal combustion engines from both vehicular exhausts (referred to as tailpipe emissions) and directly from engines (chainsaws, etc.).

The use of heavy equipment during timber hauling operations, such as logging trucks, on paved and unpaved roads would cause emissions of PM, CO, NOx, 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.

The various construction activities authorized under Lands and Realty management (such as wind power, communication sites, transmission lines, 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.

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

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, sulfur dioxide (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.

Air emissions are probable during oil and gas production. Emissions of NO_x and CO 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.

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.

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

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

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

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

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.

Trucks and heavy equipment (chain saws, fire engines, bull dozers) 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. Truck 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.

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

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

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 the Alternative 1: Continuation of Existing Management

Figure 4-25 summarizes total and specific pollutant emissions for all the alternatives. Alternative 1 emissions have been estimated for the base year (2003) time frame, and the emissions estimated for 5-year and 20-year time horizons. 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 the alternatives. Alternative 2 emissions have been estimated for the base year (2003) time frame, and the emissions estimated for 5-year and 20-year time horizons. 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 the alternatives. Alternative 3 emissions have been estimated for the base year (2003) time frame, and the emissions estimated for 5-

year and 20-year time horizons. 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: Preferred Alternative

Figure 4-25 summarizes total and specific pollutant emissions for all the alternatives. Alternative 4 emissions have been estimated for the base year (2003) time frame, and the emissions estimated for 5-year and 20-year time horizons. 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 is 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 archeological sites in the planning area is estimated to be approximately 20 sites per section (640 acres), or approximately 1 site per every 32 acres. Of these sites, about 29 percent prove to be significant in terms of NRHP criteria. The density is based on less than 11 percent of BLM surface area that has been inventoried at Class III intensity (see "Cultural Resource Inventory Classes" in the glossary for definition).
- Cultural resources would continue to be found throughout the RMPPA.

- 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 planning area.
- 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 is 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 will comply with the Wyoming Standard Mitigation Guidelines for Surface Disturbing Activities (Appendix 1) and cultural resource laws and regulations, as outlined in Appendix 5.

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 inventory and mitigation measures to minimize impacts on cultural resources.

Cultural resource management actions would provide direct protection to cultural properties from surface disturbing and other disruptive activities. Protection measures for cultural resources include cultural resource inventory, avoidance, evaluation of NRHP eligibility, and mitigation of potential effects from federal undertakings. Specifically, areas within one-quarter of a mile of cultural properties where the setting contributes to NRHP eligibility would be avoidance areas for all surface disturbing and other disruptive activities. This would protect the physical integrity of these properties from surface disturbing and other disruptive activities that may compromise the values making them eligible for NRHP. These protective measures are required by law before the initiation of any surface disturbing and other disruptive activity (Appendix 5). 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.

Cultural resource inventories, recordation, evaluations, and data recovery excavations would increase the site database and further our 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, thereby resulting in potential future data loss should new data recovery and analysis techniques be developed. 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. Managing cultural resources on a case-by-case basis would limit the ability to proactively manage high-potential areas and reduce impacts from, and conflicts with, other resource uses.

Consideration of a cultural resource's contributing setting in conjunction with compliance with laws and regulations would result in mitigation of all developments within the setting, ensuring no significant effects occur. This would ensure the protection of cultural resources such as Native American sacred sites, traditional cultural properties, and sites where the setting contributes to the NRHP eligibility.

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.

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 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 are generally assessed subsequent to the fire.

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, 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 occasionally inventory fire lines and access roads 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, 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 our understanding of prehistory. The number of unanticipated discoveries would be directly proportional to the amount of surface disturbance. 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 projects within the setting that contributes to NRHP eligibility would be mitigated to prevent significant effects. Assessment of potential impacts would be conducted through viewshed analyses, on-site inspection, and

photo inspection. Mitigation measures would include, but are not 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).

Implementing the Wyoming Standards for Healthy Rangelands (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. Livestock trampling and wallowing directly impacts cultural artifacts and features on or just below the surface through breakage and scattering. Livestock 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, and 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.

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 an estimated 181 cultural properties, of which an estimated 53 would be eligible for the NRHP. Required cultural resource inventory, recordation, and mitigation procedures 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.

OHV use on improved roads would have negligible effects 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.

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

Protections afforded to SMAs (i.e., restrictions on 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. Special recreation management area (SRMA) management would encourage recreation and 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 are constructed. The Rawlins OHV SRMA would be open to OHV use. This area has been inventoried at the Class III level, and no significant

cultural resources were identified. Therefore, impacts to cultural resources from use of the Rawlins OHV SRMA would be negligible.

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 other 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 (BLM 1997) would maintain or improve environmental conditions, soil stability, and vegetation cover, thereby protecting cultural resources. 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.

In all VRM management 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 (67,730 acres) 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.

Controlling or preventing surface disturbing and other disruptive activities in wetland/riparian areas would protect cultural resources in these areas 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.

Restrictions on surface disturbing and other disruptive activities in big game, waterfowl, amphibian, and federally listed species habitat would protect cultural resources in these areas by reducing the potential for unanticipated discoveries.

4.3.2 Impacts Under Alternative 1: Continuation of Existing Management

Wildland suppression activities would be managed for appropriate management response (AMR), which would consider 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 20-year planning period 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 218 cultural properties, of which an estimated 63 would be eligible for the NRHP. Moreover, allowing noncommercial firewood gathering without

considering potential cultural resource impacts would potentially result in a limited loss of cultural resources, such as tree carvings and historic and prehistoric wooden structures. In addition, approximately 25,900 acres would be available for commercial timber harvest, which would increase soil erosion and subsequent deterioration of cultural resources. The surface disturbance associated with this activity would potentially affect an estimated 809 cultural properties, of which an estimated 235 would be eligible for the NRHP. Approximately 1,600 of these acres would overlap with treatment areas. Standard inventory and mitigation procedures conducted in conjunction with forest management actions would protect most cultural resources from significant damage and would increase the database of known cultural properties.

The lands and realty management program has identified 61,010 acres of lands for disposal under this alternative, which would potentially affect an estimated 1,907 cultural properties, of which approximately 553 would be eligible for the NRHP. 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.

Withdrawals would be pursued on approximately 14,450 acres, which would result in closure of these areas to locatable mineral entry and future 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.

Approximately 900 acres would be disturbed by the construction of livestock range improvements over the next 20 years. This would potentially affect an estimated 28 cultural properties, of which an estimated 8 would be eligible for the NRHP. Standard inventory and recordation procedures conducted in conjunction with range improvement actions would protect most cultural resources from significant damage and would 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.

Under Alternative 1, it is anticipated that 8,945 oil and gas wells would be drilled over the next 20 years, disturbing approximately 61,895 acres of land (including all related facilities and pipelines). This would potentially affect an estimated 1,934 cultural properties, of which an estimated 561 would be eligible to be placed on the NRHP. Standard inventory and recordation procedures conducted in conjunction with mineral development would protect most cultural resources from significant damage and would 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.

Impacts to cultural resources from OHV management would be minor. With the exception of the Dune Ponds Cooperative Management Area (CMA) and 33,500 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 (33,500 acres) would be completely protected from OHV-related impacts.

Although impacts to cultural 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 one-quarter of a 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 (2,600 acres) to locatable mineral entry 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 damage to cultural resources in these areas.

Surface use restrictions associated with management of SMAs would indirectly protect cultural resources located in these areas by reducing the potential for unanticipated discoveries and subsequent loss of cultural information. The Sand Hills Area of Critical Environmental Concern (ACEC) (7,960 acres), Jep Canyon ACEC (13,810 acres), Chain Lakes wildlife habitat management area (30,470 acres), Wick-Beumee wildlife habitat management area (280 acres), Laramie Plains Lakes area (1,600 acres), Upper Muddy Creek Watershed/Grizzly area (70,780 acres), White-Tailed Prairie Dog areas, Shirley Mountain Caves SRMA (24,400 acres), and North Platte River SRMA (5,060 acres, including one-quarter of a mile 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, decreasing the potential to disturb buried cultural deposits located within the SMAs.

The area within one-quarter of a mile, or the visual horizon, of the Cherokee and Overland 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. 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) (63,530 acres) and one-quarter of a mile of the Encampment River Wild and Scenic 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 cultural resources.

Management of the Sand Hills ACEC and potential JO Ranch expansion area would benefit the historic JO Ranch through the intensive management of surface disturbing and other disruptive activities within the 18-acre area surrounding the ranch complex and through the stabilization of the historic ranch to preserve its historic integrity. Other cultural resources in the Sand Hills ACEC (7,960 acres) would be indirectly protected through the intensive management of surface disturbing and other disruptive activities.

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 next 20 years. Although as many as 3,313 cultural properties would potentially be involved, only a small portion of these sites would be sensitive to vegetation treatment measures. Inventory and recordation procedures conducted in conjunction with vegetation treatments would serve to protect sensitive cultural resources from significant damage.

Approximately 359,610 acres would be designated as VRM Class II under this alternative. 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.

Requiring that surface disturbing and other disruptive activities avoid identified 100-year flood plains; areas within 500 feet of perennial waters, springs, wells, 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 damage undocumented resources.

Avoidance or intensive management of surface disturbing and other disruptive activities in sensitive wildlife habitats would preserve cultural sites located in these areas. Cultural resources would not be affected in active raptor nests areas (19,230 acres) where surface disturbing activities are prohibited.

Summary

It is anticipated that 98,339 acres would be disturbed as a result of activities related to forest management, lands and realty management, livestock management, and minerals management. This disturbance would potentially impact an estimated 3,073 cultural properties, of which 891 would potentially be eligible for the NRHP.

Approximately 173,810 acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SMAs, 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 mitigation of visual impacts. Actions associated with other SMAs; water quality, watershed, and soils management; and wildlife and fisheries management would also provide indirect protection to cultural resources through avoidance and intensive mitigation of surface disturbing and other disruptive activities.

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 would result in the loss of some or occasionally all of the cultural resource involved. Although standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most cultural resources from significant damage, some unanticipated discoveries would likely occur. 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 recreation 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. Compliance with laws and regulations would mitigate adverse effects to the visual integrity of the setting. Mitigation measures outlined in Alternative 1 would still occur; however, the potential for collective adverse effects to the contributing setting would be increased. This would occur because developments would be allowed with less restrictive mitigation, which individually may not compromise the values for which the property is eligible; however, when several developments are permitted with less restrictive mitigation, the property's historic setting would more likely be compromised to the point that it is no longer contributing to the overall eligibility.

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, increased suppression would increase the potential for catastrophic fires in the long term through the build up of flammable materials that would damage a wider range of cultural resource types.

Commercial timber harvesting would be increased under this alternative, as clear cuts would be larger. Standard inventory and mitigation procedures conducted in conjunction with forest management actions would protect most cultural resources from significant damage and would increase the database of known cultural properties.

Impacts to cultural resources from lands and realty management would be similar to those identified in Alternative 1, except an additional 730 acres would be pursued for withdrawal. This would result in closure of these areas to locatable mineral entry and future disposal actions, thereby providing 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. 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 cultural resources that could be exempt from federal management policies.

Impacts of livestock grazing management on cultural resources would be similar to those identified in Alternative 1, except approximately 1,140 acres would be disturbed by the construction of livestock range improvements over the 20-year planning period. This would potentially affect an estimated 36 cultural resources, 10 of which would be potentially eligible for the NRHP.

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 next 20 years, disturbing approximately 63,649 acres (including all related facilities and pipelines). This would potentially affect an estimated 1,989 cultural properties, of which 577 would be potentially eligible for the NRHP. The increase in development would increase the potential for unanticipated subsurface discoveries. 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 OHV management would be similar to those identified in Alternative 1. However, an additional 480 acres would be open to OHV use, which would increase the potential for damage to cultural resources located in these areas.

Impacts to cultural resources from SMAs would be similar to those impacts identified in Alternative 1, except 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 best management practices (BMP) 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.

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 next 20 years. An estimated 31,356 cultural properties would be involved in these areas; however, only a small portion of these sites would be sensitive to vegetation treatment measures. Inventory and recordation procedures conducted in conjunction with vegetation treatments would protect sensitive cultural resources from significant damage.

Under this alternative, 125,660 fewer acres would be designated as VRM Class II than under Alternative 1 for a total of 233,950 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 restrictions on surface disturbances would be reduced in sensitive wildlife habitat areas. As a result, surface disturbing and disruptive activities would be allowed over a larger area, resulting in adverse impacts to intact buried cultural deposits.

Summary

Under Alternative 2, impacts to cultural 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 cultural properties. It is anticipated that 98,793 acres would be disturbed over the 20-year planning period as a result of lands and realty management, livestock management, and minerals management activities. This disturbance would potentially impact an estimated 2,900 cultural properties, of which 841 would potentially be eligible for the NRHP. These numbers do not include disturbance acreage or sites potentially impacted from forest management actions. We anticipate that more sites would be impacted by surface disturbance and disruptive activities than anticipated in Alternative 1.

Approximately 77,270 acres would be protected from surface disturbing and disruptive activities as a result of VRM Class I areas, SMAs, 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 233,950 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. Although standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most cultural resources from significant damage, some unanticipated discoveries would likely occur. 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

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 one-quarter of a mile of historic properties where the setting contributes to NRHP eligibility would indirectly protect all of the cultural resources within that zone. This would ensure the protection of those sites from activities that may compromise the values making them eligible for NRHP.

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 intensity, which would result in increased soil erosion, greater loss of vegetation, slower recovery of plant communities, 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 activities.

The impacts of forest management on cultural resources would be similar to Alternative 1, except that commercial logging and forest product extraction would be prohibited. This would eliminate potential impacts to cultural resources from logging activities. However, up to 30,000 acres would still be available for forest management treatments, which would have the potential of impacting an estimated 938 cultural properties, 272 of which would potentially be eligible for NRHP. Noncommercial forest product extraction would continue, potentially impacting a small number of cultural properties such as historic tree carvings or wood structures.

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 and approximately 272,350 acres would be pursued for withdrawal. Retaining all lands under federal jurisdiction would maintain protections associated with federal management policies. The withdrawal of 272,350 acres would result in closure of these areas to locatable mineral development and future 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.

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 next 20 years. Under this alternative, only 420 acres would be disturbed, potentially affecting an estimated 13 cultural properties or an estimated 4 eligible properties. However, as a result, there would be fewer cultural resource inventories, reducing the potential to increase the site database and further our 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 next 20 years, disturbing approximately 56,505 acres (including all related facilities and pipelines). This would potentially affect an estimated 1,766 cultural properties, 512 of which would potentially be eligible for NRHP. The decrease in development would decrease the potential for

unanticipated subsurface discoveries. However, fewer cultural resource inventories and site mitigations (e.g., excavations) would be required, which would serve to expand the cultural resource database.

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.

Impacts to cultural 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 ½-mile area (15,800 acres) would be subject to NSO stipulations. 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.

Preservation of the Adobe Town fringe areas (31,510 total acres) and the west end of the Ferris Mountains (5,270 total acres) would prevent surface disturbance associated with development in these areas. As a result, an estimated 984 cultural properties would be protected in the Adobe Town fringe areas, and an estimated 166 cultural properties would be protected in the Ferris Mountains.

Impacts to cultural resources from SMAs would be similar to those impacts identified in Alternative 1, except management of surface disturbance within SMAs would be more restrictive. Surface disturbance associated with new oil and gas leases would be prohibited in the following areas: the Como Bluff ACEC (1,690 acres), Upper Muddy Creek Watershed/Grizzly ACEC (70,780 acres), Sand Hills ACEC (12,700 acres), Jep Canyon wildlife habitat management area (13,810 acres), Stratton Sagebrush Steppe Research Area ACEC (5,530 acres), Chain Lakes ACEC (30,470 acres), Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Bat Cave ACEC (520 acres), Laramie Plains Lakes ACEC (1,600 acres), and North Platte River SRMA (10,370 acres, including one-half of a mile either side of the river).

Management actions associated with the Sand Hills/JO Ranch Expansion ACEC (12,700 acres) would benefit the historic nature of the ranch and associated facilities. Using the ranch as an interpretive center would provide the cultural resource program with a venue for public education on 19th century ranching practices and settlement in the area. Classifying the ranch and surrounding setting as VRM Class II would prevent development activities from adversely affecting the historic setting of the area.

The Historic Trails ACEC would be expanded to include the Rawlins to Baggs and Rawlins to Fort Washakie Freight Roads, increasing the ACEC acreage by about 25,000 acres. Surface disturbing activities would be prohibited within the ACEC, which would potentially protect an estimated 781 additional cultural properties within this area. The expansion would also increase the area designated as VRM Class II, which would provide further protection to intact buried cultural deposits located in these areas. Historic properties where the setting contributes to NRHP eligibility would also benefit because management actions would require structures to blend into the landscape when possible, thus minimizing the occurrence of adverse effects (Appendix 5).

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 next 20 years. An estimated 25,205 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 recordation procedures 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 our understanding of history and prehistory.

Impacts to cultural resources from VRM management would be similar to those identified under Alternative 1, except 582,200 more acres would be designated as VRM Class II for a total of 941,810 acres. As a result, a significantly greater number Native American sacred sites, traditional cultural properties, and other cultural properties where the setting contributes to their NRHP eligibility would receive appropriate mitigation (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 CBNG 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, development of off-channel reservoirs for water disposal would be limited; water development projects that result in greater than 1 acre of depletion in Muddy Creek would be prohibited; and reservoirs greater than 0.25 acres in size in stream channels would be restricted, which typically include dams, spreader dikes, and spillways that extend outside of the stream channel. These restrictions would provide additional protection to cultural resources located in riparian areas by limiting surface disturbance and associated damage 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 disturbances would increase in sensitive wildlife habitat areas. A greater number of areas would be avoidance areas for surface disturbing and other disruptive activities under this alternative, which would reduce the potential for damage to cultural resources located in these areas. Fewer surface locations within big game crucial winter range and within 2 miles of Greater sage-grouse and sharp-tailed grouse leks would decrease the potential to impact the visual setting of cultural properties.

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 92,719 acres would be disturbed over the 20-year planning period as a result of forest management, lands and realty management, livestock management, and minerals management activities. This disturbance would potentially impact an estimated 2,897 cultural properties, of which 840 would potentially be eligible for NRHP. This would represent a decrease of 176 cultural properties and 51 NRHP-eligible properties affected as compared to Alternative 1.

Approximately 425,280 acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SMAs, 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 Class II areas would be increased to include 941,810 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 in the above analysis, 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. Although standard inventory and mitigation procedures conducted in conjunction with surface disturbing activities would protect most cultural resources from significant damage, some unanticipated discoveries would likely occur. Because disturbance of fewer surface acres is anticipated, the potential for significant impacts would decrease as compared to Alternative 1.

4.3.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on cultural resources from fire and fuels management and livestock grazing 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 3.

Impacts to cultural resources from forest management would be similar to those identified in Alternative 1, except 6,700 fewer acres would be available for commercial timber harvest. This would decrease the potential for damage to cultural resources associated with logging activities. Specifically, this would impact 210 fewer cultural properties (or 60 properties eligible for NRHP) than forest management actions under Alternative 1.

Impacts to cultural resources from lands and realty management would be similar to those identified in Alternative 1, except an additional 6,790 acres would be pursued for withdrawal. This would result in closure of these areas to locatable mineral entry and future disposal actions, which would provide additional protection to cultural resources located in these areas (an estimated 644 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 461 properties) that would be removed from federal jurisdiction.

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 next 20 years, disturbing approximately 57,819 acres (including all related facilities and pipelines). This would potentially affect an estimated 1,807 cultural properties, 524 of which would potentially be eligible for NRHP. The decrease in development would decrease the potential for unanticipated subsurface discoveries. 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 an additional 11,010 acres would be closed to OHV use. This would eliminate the potential for damage to cultural resources associated with OHV use in these areas.

Impacts to cultural 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 ¼-mile area (7,930 acres) would be subject to NSO stipulations. In addition, the west end of the Ferris Mountains (5,300 acres) would be closed to new oil and gas leasing, and surface disturbing activities on existing leases would be intensively managed to preserve naturalness in the area. 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 cultural resources in these areas by limiting the level of surface disturbing and other disruptive activities.

Impacts to cultural resources from management of SMAs would be similar to those identified in Alternative 1, except surface disturbing and other disruptive activities would be prohibited within one-quarter of a mile (or the visual horizon) of the Cherokee and Overland trails. Prohibitions on surface-disturbing and other disruptive activities within the Encampment River WSR (Map 2-19) would be expanded to include the entire viewshed of the river segment. These actions would increase indirect protections to cultural resources by substantially reducing the level of surface disturbance that would be allowed within these areas.

The Sand Hills ACEC and proposed JO Ranch expansion would be expanded, which would provide further protection for the historic JO Ranch and its viewshed. This expansion would also increase the amount of area that would be intensively managed for surface disturbing and other disruptive activities, which would increase protection to a greater number of cultural resources. Reduction of the Historic Trails SMA to exclude the Rawlins to Baggs and Rawlins to Fort Washakie Freight Roads would reduce the number of sites protected from activities that may compromise the values making them eligible for NRHP.

Impacts to cultural resources from vegetation management would be similar to those impacts identified in Alternative 1, except that vegetation and weed treatments (mechanical, biological, chemical, and prescribed fire) would be increased to include 828,460 acres over the next 20 years. An estimated 25,880 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 recordation procedures 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 229,920 more acres would be designated as VRM Class II for a total of 589,530 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.

Impacts to cultural resources from water quality, watershed, and soils management would be similar to 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 cultural resources located in stream channels. Limiting the development of off-channel reservoirs would provide additional protection to cultural resources located in riparian areas by limiting surface disturbance and associated damage 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 disturbances would increase in sensitive wildlife habitat areas. A greater number of areas would be avoidance areas for surface disturbing and other disruptive activities under this alternative, which would reduce the potential for damage to cultural resources located in these areas. Fewer surface locations within big game crucial winter range would decrease the potential to impact the visual setting of cultural properties.

Summary

Under Alternative 4, 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 87,583 acres would be disturbed over the 20-year planning period as a result of forest management, lands and realty management, livestock management, and minerals management activities. This disturbance would potentially impact an estimated 2,737 cultural properties, of which 794 would

potentially be eligible for NRHP. This would represent a decrease of 336 cultural properties and 97 NRHP eligible properties affected as compared to Alternative 1.

Approximately 225,830 acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SMAs, 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 589,530 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 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. Although standard inventory and mitigation procedures conducted in conjunction with surface disturbing and other disruptive activities would protect most cultural resources from significant damage, some unanticipated discoveries would likely occur. Because disturbance of fewer surface acres is anticipated, the potential for significant impacts would decrease as compared to 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, 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 resulting in a substantial increased risk from wildland fire to public health and safety, other resource values, or destruction of property
- Changes in vegetation communities that 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 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 planning area 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.
- Reasonably foreseeable development (RFD) and RFA can be found in Appendix 33.

4.4.1 Impacts Common to All Alternatives

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 potentially affect the methods of fire suppression. 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 (i.e., approximately 500 acres per year would be disposed). OHV use would increase the potential for wildland fire ignition by catalytic converters on OHVs.

Increase in public land use (e.g., recreation) within the RMPPA, and development of private lands adjacent to public lands, would increase the frequency of human-caused fires and the need for fuels treatments, mitigation strategies, education, hazard reduction plans, and wildland fire prevention. Increased frequency of fire would also reduce the opportunity to reintroduce wildland fire into fire-dependent ecosystems.

The proliferation of roads in remote areas would increase fire occurrence, by introducing additional human-caused ignition sources. However, an improved road network in the RMPPA would improve emergency vehicle access and enable an earlier response to fire ignitions.

4.4.2 Impacts Under Alternative 1: Continuation of Existing Management

The AMR would occur on every acre in the RMPPA, giving managers the flexibility to place wildland fire fighting resources where they are most needed to allow wildland fire to benefit other resources when appropriate. Any fire suppression activities that result in a reduction of the size and intensity of wildland fire in the long term would increase the opportunity for larger, more intense fires. An estimated 4,000 acres of wildland fire occurring annually would not achieve the goal of reintroducing fire into fire-dependent ecosystems.

Increases in population and development under minerals and transportation and access management could increase the frequency of human-caused fires and the potential for large wildland fires to occur. However, roads to timber harvest areas and roads and pipelines associated with mineral development would improve access, create fuel breaks, and provide fire control lines when backfired in suppression situations. Also, the ability to use wildland fire for resource benefit would allow for the reintroduction of fire into fire-dependent ecosystems while reducing large fire suppression efforts.

Mineral development would require a greater emphasis on wildland fire suppression and fuels management in areas adjacent to industrial interface for purposes of public health and safety and protection of property values. An increase in the number of fuel reduction projects, especially in wildland urban interfaces (WUI), would slow the spread and improve opportunity for the containment and control of wildland fire. Also, assistance to local communities would improve public and firefighter safety and increase the ability of cooperators to suppress wildland fires. Public service announcements and newspaper articles, in conjunction with posting bans would aid public understanding and compliance with fire regulations and reduce the potential for human-caused fire ignition.

Increased recreation, such as camping and backpacking, could 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 could assist the fire program by spotting and reporting wildland fires, which could improve response time.

Achieving forest health objectives would reduce the amount of dead and downed forest fuels resulting from insect damage, disease, and overgrowth, which would reduce the frequency and intensity of wildland fire. Forest management actions that reduce conifer encroachment in aspen communities would reduce the frequency and intensity of wildland fire. Harvest of timber, firewood gathering, and thinning activities would reduce fuels but would increase ignition sources (e.g., chainsaws). In the long term, achieving forest health and a diverse mosaic of age classes within forest communities would reduce the size and intensity of wildland fires.

Livestock grazing, in some situations, could reduce fine fuels and decrease the capacity for the spread of wildland fires. However, in the long term the accumulation of larger fuel sources (e.g., shrub vegetation) between fires would increase the potential for larger more intense wildland fires to occur. Water developments for livestock provide additional sources of water for fire suppression activities, and livestock trails create fuel breaks if back-burned during fire suppression efforts, which could further aid in the control of wildland fire.

Vegetation management actions to achieve healthy, DPCs would promote mosaic vegetation patterns, which could slow the spread of wildland fires and reduce the size and intensity of wildland fires in treatment areas in the short term. 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, resulting in the majority of plant communities being in late seral stages and increasing the potential for wildland fires to occur.

Wildlife management (i.e., special status wildlife species habitat) would affect AMR by increasing the complexity of wildland fire management. Specific vegetation goals for wildlife species habitat would be considered during decisions for allowing wildland fire to be used as a resource benefit, or when considering whether suppression is the appropriate response.

Management of special status plant species and the presence of established weed populations would affect AMR by increasing the complexity of wildland fire management. For example, the use of heavy equipment to build fire lines may not be possible in Special Status Species populations or in established weed populations (i.e., to prevent spread).

Summary

Increases in public land use and development under minerals and transportation and access management could 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, could 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.

The ability to use wildland fire for resource benefit would allow for the reintroduction of fire into fire ecosystems, which could reduce large fire suppression efforts over the long term.

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.

4.4.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Emphasis on fire suppression of all wildland fires under this alternative would reduce the amount of acreage burned each year (an estimated 2,000 acres/year). However, minimizing the use of wildland fire for resource benefit could 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.

Management actions aimed at reducing the spread of noxious and invasive species (e.g., cheatgrass) would also reduce the potential for fire ignition and spread over the long term. In the short term, 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 addition, the significant increase in landscape-scale vegetation treatments (24,400 acres/year) would create more diverse vegetation communities in treated areas and reduce the size and intensity of wildland fires.

The impacts to fire and fuels management from transportation and access management and livestock management would be the same as Alternative 1.

Impacts from wildlife management are similar to those of Alternative 1. Mitigation for Special Status Species would result in fewer restrictions on fuels reduction projects.

Impacts from forest management would be similar to those of Alternative 1, except larger blocks of commercial timber harvest areas under Alternative 2 would reduce fire fuels. This reduction of fire fuels could decrease potential for the spread of wildland fire in harvested areas.

The termination of the Como Bluff, Jep Canyon, Shamrock Hill and Sand Hill ACECs would eliminate any special restrictions on fire suppression activities, which could reduce the complexity of AMR in these areas.

Summary

The approximate 10-fold 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 amount of acreage burned each year, would limit the reintroduction of wildland fire into fire-dependent ecosystems and would increase the need for and complexity of rehabilitation and restoration efforts.

Similar to Alternative 1, increased development would increase sources of fire ignition, which could increase the complexity of AMR.

4.4.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

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 fire suppression efforts. No commercial timber harvest under this alternative would require increased fuel reduction and would increase the complexity of AMR.

The impacts to fire and fuels management from transportation and access management and livestock management would be the same as Alternative 1.

Management of SMAs (i.e., ACECs, SRMAs) would increase the complexity of wildland fire and fuels management through restrictions on the use of surface disturbing fuels removal and fire suppression equipment. However, the management of the Encampment watershed as a community protection area for municipal water supply would change the AMR strategy for this area to emphasize suppression efforts. Fuel reduction projects would be allowed in this watershed to reduce the impact of wildland fires

Wildlife management restrictions on fuels management activities (i.e., seasonal restrictions on raptor nests, big game parturition areas, threatened and endangered species habitat, and Greater sage-grouse and sharp-tailed grouse leks) would reduce the window of opportunity to conduct fuels management activities.

The increase in vegetation treatments (11,800 acres, plus those acres receiving weed treatments) would result in a higher proportion of vegetation communities in early to mid-seral condition. 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. Similar to Alternative 2, 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, and could increase the complexity of wildland fire management in the short term.

Summary

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 could achieve the goal of reintroduction of the role of wildland fire into fire-dependent ecosystems. Similar to Alternative 2, 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, and could increase the complexity of wildland fire management in the short term.

Management of wildlife and SMAs under Alternative 3 would increase the complexity of AMR and reduce the window of opportunity to conduct fuels management activities.

4.4.5 Impacts Under Alternative 4: Preferred Alternative

The impacts to fire and fuels management from transportation and access management, and livestock grazing management would be the same as Alternative 1.

Impacts from forest management would also be the same as Alternative 1, except that fewer acres available for commercial timber harvest would increase the possibility of wildland fire in these areas

(6,700 acres). Also, greater emphasis on the use of wildland fire for resource benefit would result in an increase in vegetation treatments (an estimated 16,400 acres/year, not including weed treatments). These treatments would create more diverse vegetation communities in treated areas and reduce the size and intensity of wildland fires.

In areas of intermixed land ownership, additional coordination between state, private, and federal lands would be necessary to suppress fires under the AMR. Within the Blowout Penstemon ACEC, additional management actions would be required to use wildland fire as a tool for early plant succession.

Similar to Alternative 3, wildlife management restrictions on fuels management activities (i.e., seasonal restrictions on raptor nests, big game parturition areas, threatened and endangered species habitat, and Greater sage-grouse and sharp-tailed grouse leks) would reduce the window of opportunity to conduct fuels management activities.

Summary

Greater emphasis on the use of wildland fire for resource benefit would result in an increase in fuels treatments (an estimated 16,400 acres, not including weed treatments). These treatments would create more diverse vegetation communities in treated areas and reduce the size and intensity of wildland fires.

Similar to Alternative 2, 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, and could increase the complexity of wildland fire management in the short term.

Similar to Alternative 3, wildlife management actions would increase the complexity of AMR and reduce the window of opportunity to conduct fuels management activities.

4.5 FOREST RESOURCES

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 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, which would not exceed 10 acres, 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 timber harvest.
- 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

Cultural resource laws and regulations would potentially affect the type and amount of forest management actions. Forest thinning projects or commercial harvest would potentially be modified if a known NRHP-eligible cultural resource site were present. In very rare cases, a forest management project would be precluded if redesign or other mitigation measures were not adequate. However, the potential for this to occur is negligible.

Developed recreational sites would not be available for timber harvesting. Because recreational sites are generally small and not heavily forested, there would be very little impact on commercial harvesting. Recreational pursuits in forested areas are generally compatible with most forest management activities, including forest health objectives and some timber harvesting. In areas not set aside for recreational use, the impact would be low or negligible.

4.5.2 Impacts Under Alternative 1: Continuation of Existing Management

The decline in local demand for saw timber has directly reduced timber harvests and is expected to continue over the long term. Reductions in harvests would contribute to overgrowth of forest stands, thus creating the need for alternative management actions. There would be an increase in alternative methods for achieving the Healthy Forest Initiative goals. Because of this decline in demand for saw timber, forest management would focus on forest health for ecological objectives, rather than timber production.

The condition of the commercial forestland would improve over the long term because mature and over-mature trees would be removed and replaced with younger healthier stands. Management actions are designed to help control insect and disease outbreaks. Over the next 100 years, the nonharvested commercial forestland would continue to follow a natural succession with increased likelihood of insects, disease, wildland fire, and stagnation problems.

The majority of forestland within the RMPPA falls within the suppression fire management category. Although this designation would increase the potential for fuel loading, it would also protect timber stands that would be used in commercial harvest. There would be an increased need for forest management actions including thinning projects, prescribed burns, and commercial harvest.

Table 4-2 shows the change in age-class distribution of lodgepole pine over the next 100 years. As shown in the table, an improvement would occur in age-class distribution.

Table 4-2. Long-Term (100 Years) Age-Class Redistribution of Lodgepole Pine Under Current Management

Age Class (Years)	Present Situation (%)	Long-Term Change (%)	Ideal Age-Class Distribution (%)
0–10	6	8	10
10–40	17	24	30
40–70	16	24	30
70 or more	60	44	30

Source: Medicine Bow-Divide (Great Divide Resource Area) EIS, 1988 (with the present situation percentage updated to account for the past 15 years).

Pursuing legal access to Shirley Mountain, Elk Mountain, Arlington, and Little Medicine would increase the ability to control insect and disease on BLM forested lands. Individual problem areas would be more likely to be treated in a timely manner, improving the overall condition of the forestlands. Access would allow commercial harvesting of timber.

The greatest potential for fluid mineral development occurs outside forested areas; therefore, impacts from mineral development would be negligible. Other types of mineral actions including mineral material disposals, locatable mineral entry, and mining for saleable minerals do occur in forested areas. These activities would remove timber for the construction of access roads and mine sites, potentially reducing commercial harvest size. However, the development of a road network associated with mineral actions would improve access to potential harvest areas.

Most forested areas within the RMPPA are open to OHV use on designated roads and vehicle routes. Impacts on forest management from OHV use could result from additional two-tracks and increased erosion. However, these impacts are expected to be minor.

Vegetation management actions would help to achieve the objectives of the Healthy Forest Initiative by removing decadent stands and conifer encroachment in aspen stands. The amount of timber available for commercial harvest would be reduced in the short term; however, the overall health of the stands would increase in the long term.

Forested public land adjacent to the Medicine Bow National Forest and a portion of Shirley Mountain are managed under VRM Class II. Timber harvests in these areas would be VRM classifications. VRM classifications would impact forest management by influencing the size and shape of harvest units, and determining the location and construction of access roads.

Elk and mule deer habitat in forested areas would require more intensive management, which would potentially modify timber harvest plans; however, the forest management practices generally improve habitat for big game species. Timing stipulations for wildlife protection would seasonally limit forest management practices such as timber harvest and thinning activities.

Summary

Forest management practices would potentially be modified through stipulations from cultural, VRM, and wildlife management actions. The overall health of timber stands would be improved through increased access and forest management actions. There would be some loss of harvestable acreage from minerals, OHV, and cultural resource management actions.

4.5.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from lands and realty management; minerals management; OHV management; SMA management; vegetation management; water quality, watershed, and soils management; and wildlife and fish management would be the same as those in Alternative 1.

The decline in local demand for saw timber has directly reduced timber harvests and is expected to continue over the long term. Reductions in harvests would contribute to overgrowth of forest stands, thus creating the need for alternative management actions. There would be an increase in alternative methods for achieving the Healthy Forest Initiative goals. Forest management would focus on forest health for timber production, rather than ecological objectives.

Legal access to Shirley Mountain, Elk Mountain, Arlington, and Little Medicine would not be pursued, decreasing the ability to control insect and disease on BLM forested lands. Individual problem areas would be less likely to be treated in a timely manner, compromising the overall condition of the forestlands.

Impacts resulting from VRM management 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, which would provide more opportunities for timber harvest in the area.

Summary

Forest management practices would potentially be modified through stipulations from cultural and wildlife management actions. The overall health of timber stands would be improved through increased forest management actions. Access to isolated parcels would not be pursued, potentially reducing overall forest health in localized areas. There would be some loss of harvestable acreage from minerals, OHV, and cultural resource management actions. There would be an increased potential for timber harvest with fewer VRM restrictions.

4.5.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from lands and realty management, OHV management, and VRM management would be the same as those in Alternative 1.

The use of wildland fire for resource benefit would result in improved forest health. This could include areas of decadent forest stands, stands infested with insects or disease, and species like ponderosa pine that have a short fire return interval.

Increased access to forested areas, specifically the Arlington, Little Medicine, Shirley Mountain, North Laramie River, Pine Mountain, and other forested areas and woodlands would improve opportunities for forest health management.

Impacts from minerals management would be the same as Alternative 1, except there would be more restrictions placed on surface disturbing and other disruptive activities, which would protect forest resources.

Impacts resulting from vegetation management would be the same as those in Alternative 1, except the reintroduction of fire into the ecosystem would improve stand health in fire-dependent ecosystems.

Impacts resulting from water quality, watershed, and soils management would be the same as those in Alternative 1, except for the Encampment River Watershed (municipal water supply), which would need to be managed for minimum disturbance. This could limit some types of forest management actions such as fire in this area.

Impacts resulting from wildlife and fisheries management would be the same as those in Alternative 1, except there would be more protection placed on wildlife protections from timing stipulations, which would potentially influence the type of forest management actions.

Summary

Forest management practices would potentially be modified through stipulations from cultural, VRM, and wildlife management actions. The overall health of timber stands would be improved through increased access and forest management actions. There would be some loss of harvestable acreage from minerals, OHV, and cultural resource management actions. Minimal impacts to forest health would occur as a result of the reintroduction of natural fire into the forest and woodland resources.

4.5.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from fire and fuels management, cultural resource management, lands and realty, and mineral resource management would be the same as those in Alternative 1.

Impacts from transportation management; vegetation management; water quality, watershed, and soils management; and wildlife and fish management would be the same as those of Alternative 3.

Forest management would benefit forest health by reducing fuels, increasing mosaic classes, and providing for commercial harvest of timber. However, fewer acres of allowable commercial timber would reduce the amount of timber that could be harvested and increase the amount of acres needed for additional management activities other than harvest.

OHV management would be similar to Alternative 1, except that restricting OHV use to access big game kills and campsites to an area within 300 feet of designated roads and vehicle routes (as compared to no restrictions for these purposes under Alternative 1) would provide additional protection of forest resources from OHV disturbance.

Impacts resulting from the management of SMAs would be the same as those under Alternative 1, except that additional restrictions on timber harvest within one-quarter of a mile of the bat cave complex (Cave Creek Cave) within the Shirley Mountain Bat Cave ACEC would restrict timber harvest in these areas.

Summary

Forest management practices would potentially be modified through stipulations from cultural and wildlife management actions. The overall health of timber stands would be improved through increased access and forest management actions. There would be some loss of harvestable acreage from minerals, OHV, and cultural resource management actions. There would be an increased potential for timber harvest with fewer VRM restrictions. Restrictions on timber harvest within one-quarter of a mile of the Shirley Mountain Bat Cave ACEC and the reduction in the acres available for timber harvest would require other forest management practices to improve forest health and limit opportunities for timber harvest.

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 ESRI's ArcGIS Desktop 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. The BLM Rawlins Field Office 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 Sec. 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 USC 315f).

- It is anticipated that the 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. However, a withdrawal review program would be initiated to determine if those withdrawals would be retained, 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, 5. access roads, and 6. 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 may 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 may 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

The management actions under any alternative would influence the location of ROWs and other authorized facilities. The limitations and restrictions placed on development of ROWs and facilities would depend on the locations of sensitive resources and the potential environmental impacts to those resources from realty actions.

Protection measures for cultural resources eligible for listing on the NRHP generally include avoidance of cultural properties or other mitigation measures designed to reduce impacts to cultural property settings where the setting contributes to the NRHP eligibility. These mitigation measures would modify the location, height, and color of facilities, or in very rare cases, may prohibit lands and realty actions that would otherwise adversely affect the cultural resources. Avoidance of cultural properties would occasionally require installation of facilities in areas that are more difficult to develop or reclaim, which would potentially increase impacts to other resources.

Land tenure adjustments would benefit the overall management of the public land through consolidation or disposal of isolated parcels. Land tenure adjustments identified in the Great Divide RMP (BLM 1990a) 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.

4.6.2 Impacts Under Alternative 1: Continuation of Existing Management

The protection of the visual setting of cultural properties (where the visual setting contributes to NRHP eligibility) would be achieved through avoidance or other mitigation measures (Appendix 5). In very 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. To maintain the visual settings, ROWs and facilities would be redesigned to minimize impacts to the contributing setting.

Approximately 61,010 acres of BLM-administered public lands meet the FLPMA disposal criteria and would be available for consideration for disposal (Maps 2-22 through 2-25 and Appendix 7). 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 sale or exchange 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.

Areas with important resource values would be avoided where possible in planning for new facility placement, which could increase the length of linear facilities, facility location. If it becomes necessary for facilities (i.e., linear ROW) to be placed within avoidance areas, special design characteristics would be required to minimize disturbance to important resource values.

Existing and future mineral leasing, exploration, and development would preclude the ability to sell or exchange public land parcels. The duration of the impact would be directly related to whether the site presents any mineral production and for how long the production continues. Minerals management actions, because they are so numerous in specific parts of the RMPPA, would potentially affect the location of subsequent ROWs.

Intensive surface management of energy development and exploration within one-quarter of a mile of the incorporated boundaries of all cities (1,630 total acres) could limit the ROW actions in these areas. However, the limitation would maintain the availability for potential community expansion.

Recreation sites would preclude operation of the public land laws, including sale. There would be a minimal impact on the lands and realty program from recreation management. This is due primarily to the small acreage required for recreation sites, which can easily be avoided during placement of ROWs and facilities.

Impacts from all SMAs and the management actions designed to protect the values of the SMAs influence the location of ROWs, easements, and other authorizations. Location of ROWs and easements would be precluded within some SMAs (8,105 acres); however, in most cases, sufficient opportunity would exist to locate linear facilities outside of these areas.

VRM classifications would impact the location, route, height, and color of new ROW facilities. Projects would need to be designed to meet the objectives of the established VRM class for the project area (Map 2-51). Most ROW facilities would be compatible with VRM Classes III and IV. Any ROWs or facilities proposed within VRM II would be designed to meet the objectives of that class. The area of VRM Class II would be 359,610 acres.

Management actions for watershed areas aimed at avoiding wetland/riparian areas would result in restrictions and/or relocation of ROWs. The presence of sensitive wetland/riparian areas would potentially limit or even exclude some land disposals. Management actions related to protecting soils, such as avoidance of steep slopes or erosive soils, would influence ROW locations and method of construction.

Mitigation measures (e.g., seasonal restrictions) to protect wildlife resources and threatened and endangered species and Critical habitats would impact lands and realty actions by restricting the timing of surface disturbing and other disruptive activities.

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 greatly 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 cultural resource management actions would be the same as those under Alternative 1.

Impacts from lands and realty management would be the same as those in Alternative 1, except the area identified as potentially suitable for disposal would be reduced to 46,230 acres and proposed withdrawals would be increased slightly by 730 acres to 8,390 acres (see Table 2-2 for a list of proposed withdrawals).

Impacts as a result of utility and transportation systems management in areas with important resource values would be treated the same as those in Alternative 1, except as indicated by avoidance and exclusion areas listed in Table 2-5.

Impacts resulting from minerals management would be greater and would affect more of the RMPPA under this alternative than Alternative 1 because of fewer restrictions on use in the RMPPA and increased development. This alternative would provide the most opportunity for mineral development and production, allowing more areas to be open for all types of mineral development, which would increase land use. This would impact lands and realty management by increasing the demand for ROW authorizations.

Intensively managing energy development and exploration within one-quarter of a mile of the incorporated boundaries of all cities (1,500 total acres) would restrict the location and routes of proposed ROWs.

Impacts resulting from SMA management would be the same as those under Alternative 1, except there would be fewer restrictions on ROWs within proposed and existing SMAs. A total of 8,825 acres would be avoided, if possible, for ROW and facility placement. Influences by these SMAs on the lands and realty management program include possible height restrictions, color requirements, location of facility, and preferred route (see Table 2-2 Proposed Withdrawals).

Impacts resulting from recreation management would be the same as those in Alternative 1.VRM management would result in fewer restrictions and more opportunities for ROW authorizations under this alternative because of reduction in VRM Class II acreage (233,950 total acres).

Summary

Under Alternative 2, it is anticipated that there would be no reduction in ROW authorizations and development activities in relation to Alternative 1. The potential exists that there would be an increase in

ROW authorizations and development activities because of fewer restrictions in existing and potential SMAs and reduced VRM Class II area. Impacts to land tenure adjustments would be the same as under Alternative 1. 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 cultural resource management actions would be similar to those of Alternative 1, except that preclusion of development within one-quarter of a mile, or the visual horizon, of historic properties where setting contributes to NRHP eligibility would restrict the locations of new ROWs. This would influence the location of lands and realty actions allowed to occur within the RMPPA.

No specific tracts of land would be considered for disposal. Proposed withdrawals from operation of the public land laws would increase to 272,350 acres as a result of an increase in SMAs (Table 2-2). This would influence the location, route, height, and color of proposed ROWs and facilities within proposed withdrawal areas.

Impacts resulting from minerals management would be the same as those of Alternative 1, except there would be less mineral development, resulting in fewer ROW actions. NSO requirements within one-half of a mile of incorporated boundaries of all cities (4,500 total acres) would restrict ROW actions in these limited areas.

Developed and undeveloped recreation sites (9,600 acres) and the surrounding ½-mile area (an additional 15,800 acres) would be open to oil and gas leasing with an NSO stipulation, which would preclude the placement of ROWs and easements on an additional 7,870 acres (compared to Alternatives 1 and 2); however, because these sites are relatively small, there would be sufficient opportunity outside of these areas for placement of ROWs and easements.

Impacts resulting from SMA management would be similar to those under Alternative 1, except there would be less opportunity for ROWs because of more restrictive management actions required to protect sensitive resource values in many of the SMAs. Areas designated as SMAs would encompass 402,280 acres. Many of the SMAs would be closed to the operation of the public land laws (Table 2-2), and no new oil and gas leases would be allowed in the Chain Lakes ACEC, Sand Hills ACEC, Jep Canyon wildlife habitat management area, Laramie Plains Lake ACEC, Shirley Mountain Bat Cave ACEC, and Rawlins OHV SRMA. The increase in closures and areas where no new oil and gas leases would be allowed would reduce the number of acres where ROW actions could be permitted. Not allowing ROWs or facilities within one-quarter of a mile of the contributing portions of historic trails would influence the ROWs location, route, height, and aboveground color.

Impacts resulting from VRM management would be the same as those of Alternative 1, except changes in VRM class (Map 2-49) would result in more restrictions on ROW actions because of a significant increase in VRM Class II acreage (941,810 acres). Designation of VRM Class II would not result in preclusion of lands and realty actions, but rather would result in implementation of 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.

Impacts resulting from water quality, watershed, and soils management would be the same as those of Alternative 1, except management of the Encampment River Watershed would not allow new permanent roads or structures in this area.

Impacts resulting from wildlife and fish management would be the same as those under Alternative 1; however, management actions, such as increased timing restrictions and greater avoidance distances (see Table 2-10), would preclude construction during a greater part of the year.

The presence of special status and sensitive wildlife species and habitats could preclude land disposal.

Summary

A slight reduction in ROW authorizations and development activities could occur under this alternative. The presence of special status and sensitive wildlife species and habitats could 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: Preferred Alternative

A total of 46,230 acres (same acreage as proposed under Alternative 2) would be identified as suitable for disposal (Appendix 7). Existing closures to operation of public land laws and locatable mineral entry would total 1,582,260 acres, with an additional proposed closure area of 34,024 acres. The ability to sell or exchange land and issue R&PP leases/patents would benefit communities and industry by allowing for needed community and economic expansion. Sale or exchange of isolated tracts would result in the disposal of land that is difficult to manage, thereby improving the lands and realty program management.

Impacts resulting from recreation management would be the same as those in Alternative 1.

Impacts resulting from lands and realty management would be similar to those identified under Alternative 1. However, the withdrawals proposed under this alternative would increase from 7,660 acres (Alternative 1) to 14,450 acres. The location, route, color, and height of proposed ROWs and facilities would be influenced by this increase of withdrawals.

Impacts resulting from VRM management would be the same as those of Alternative 1, except the designated acreage of VRM Class II would increase to 590,530 acres (Table 2-9). This would influence the type, location, route, height, and color of more ROWs and facilities, as compared to Alternative 1.

Impacts resulting from water quality, watershed, and soils management would be the same as those of Alternative 3.

Summary

It is anticipated that there would be little reduction in ROW authorizations and development activities under Alternative 4, except that the type, location, route, height, and color of more ROWs and facilities would be influenced.

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

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 very small. Fencing of some cultural sites would potentially exclude grazing, causing a loss of available forage. Restrictions on surface disturbing and other disruptive activities near cultural sites would potentially result in modifications or relocation of range improvements, but not preclude them except in rare cases.

Prescribed fires initially displace livestock and in the short term, reducing forage and AUMs. Over the long term, prescribed fire normally improves forage production and availability, which may improve livestock distribution. Prescribed fires can increase watershed yield, which increases stock water and sediment loads. This can accelerate the rate at which stock ponds fill with sediment and lose capacity, which allows peak flows following storm events to damage diversions or other infrastructure downstream.

Deferment of livestock use after a wildland fire allows the establishment of new vegetation and would have a short-term effect on livestock operators by reducing available AUMs and modifying grazing systems. Livestock would use nonburned areas during the recovery period, or there would be temporary reductions in grazing use if other forage was not available. Wildland fires often damage livestock improvements such as fences and corrals, resulting in increased maintenance needs for the livestock operator and the need to herd livestock, and reducing pastures available for use.

Noncommercial forestlands would be managed primarily 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 encroaching conifers from shrub and aspen stands, thinning of diseased and insect-infested trees, and reducing fuel loads. These practices would result in increased forage and available water for livestock grazing.

Depending on the activity, impacts from lands and realty management actions on livestock grazing are either long term or short term. Short-term impacts are caused by construction of power lines and pipelines, and other construction activities, which temporarily remove forage and displace livestock. Long-term impacts include loss of forage where roads and facilities are constructed, reduced forage palatability because of dust on vegetation, and disturbance and harassment caused by increased levels of human activity. Approximately 5,794 acres could be impacted from short- and long-term lands and realty actions, not including oil and gas development. Management of livestock would be problematic as a result of increased levels of human activity, because of damage to fences, gates left open, and poisonous weed proliferation. All these impacts result in either reduced forage, lower livestock performance, increased mortality, or increased management. Reclamation of short-term disturbances would replace the forage lost because of lands and realty activities. Permanent roads maintained by other entities often benefit livestock management as better access is provided for checking, moving, or providing supplemental feed to livestock.

Road construction issued under ROWs would affect livestock grazing operations by creating surface disturbances, removing vegetation, and disturbing livestock. Land clearing and grading activities necessary for construction would remove vegetation and cause a short-term reduction in the forage base. Construction activities would also generate additional dust deposits on vegetation, which would reduce the overall quality of the affected forage.

Permanent losses of forage would occur as a result of road construction, land disposals and exchanges, and development of wind farms and other facilities. Loss of AUMs would occur when large blocks of land are either disposed to the public or the land exchange is not in the same area as the allotment losing the land.

The effects of livestock grazing management on the livestock grazing program are principally the effects of forage removal by the grazing animals, which may alter the amount, condition, and vigor of the plants being grazed. Pasture and herd rotational grazing practices, as well as other BMPs, are intended to increase livestock dispersal in pastures and reduce the impacts of livestock grazing. These practices often improve the condition of the forage, thereby increasing flexibility in the grazing management program. Other indirect effects on livestock include increased conception rates, higher weaning weights, lower animal veterinary costs, less stress to livestock, and fewer bulls needed for breeding. These practices may also increase the amount of herding and maintenance of improvements required by the livestock operator. Prohibiting domestic sheep and goats within 9 miles of bighorn sheep habitat creates no impact on livestock grazing, because there is currently no domestic sheep use permitted within those areas. However, the flexibility of livestock operations to change or adjust the type of livestock they use would be reduced by not allowing domestic sheep use (if applications are made) in these areas.

Impacts from minerals management on livestock grazing would include short- and long-term impacts. Short-term impacts include temporary removal of forage and displacement of livestock from construction of well pads, pipelines, roads, and other facilities. Long-term impacts include loss of forage where roads and facilities are constructed and reduced forage palatability because of dust on vegetation near roads. All these impacts result in either reduced forage, lower livestock performance, or increased need for management. Reclamation of short-term disturbances would replace the forage lost from construction

activities. Permanent roads often benefit livestock management as better access is provided for checking, moving, or providing supplemental feed to livestock.

The only remaining coal mine in the area is closing and will be reclaimed. The lands will 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 create a network of access roads, pipelines, wells, and other facilities. During the construction of pipelines, livestock could possibly fall into construction trenches, causing injury and death. Produced water from oil and gas activities would be made available for livestock use if water quality were sufficient. This additional water would increase livestock distribution and available forage for livestock, wildlife, and other uses.

OHV use would have a minor effect on livestock grazing activities through direct human disturbance, which causes animal displacement, dust coating of forage from nearby roads, and injury or death to animals caused by vehicle-animal collisions. Incidental damage to range improvements and gates being left open would also affect livestock operations.

In general, management actions associated with paleontological 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 very small. Fencing of some paleontological sites would potentially exclude grazing, causing a loss of available forage. Restrictions on surface disturbing and other disruptive 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 have a minor effect on livestock grazing activities through direct human disturbance, which causes animal displacement, dust coating of forage from nearby roads, and injury or death to animals caused by vehicle-animal collisions on roads or highways. Grazing closures in recreational areas 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. Vandalism to range projects and leaving gates open would also have a minor impact on grazing operations. These impacts would likely increase over the life of the plan, because the popularity of outdoor recreational activities is increasing. Education of the public who use these areas and emphasizing the benefits of multiple-use management would mitigate some of these conflicts and may create advocates for traditional uses of BLM lands.

Minimal effects on livestock grazing activities would be anticipated as a result of management actions associated with SMAs. In general, the protections afforded to these areas (i.e., restrictions on surface disturbing and other disruptive activities) would help to maintain and improve vegetation conditions, thereby maintaining or improving forage for livestock.

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.

Vegetation management actions designed to enhance vegetative conditions would directly affect livestock grazing activities by enhancing and increasing forage production and vegetation age and structural diversity, thereby improving livestock distribution and forage utilization. Vegetation treatment areas would receive short-term deferment to allow vegetation to recover. However, enhanced forage availability and production would be realized over the long term with herbaceous vegetation replacing woody shrub species. Vegetation management would also result in grazing management adjustments in the season and duration of use. Livestock adjustments would also be needed to meet a proper function

condition (PFC) rating and the Wyoming Standards for Healthy Rangelands (BLM 1997). Vegetation/fuel treatment can improve vegetation composition in riparian areas and increase available stock water, if the vegetation treatment results in a favorable increase in water yield. Increased sediment loads following prescribed fires may fill stock ponds, thereby reducing capacity.

VRM classifications that restrict surface disturbing and other disruptive activities would indirectly help to maintain forage production levels by reducing the number of surface disturbing and other disruptive activities, which have the potential to eliminate forage and increase the potential for noxious or invasive weeds.

Any project designed to enhance watershed health would enhance vegetation resources by reducing erosion, which would have the indirect effect of increasing forage levels 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 (BLM 1997). In addition, grazing restrictions on season and duration of use would result from actions designed to protect and enhance water resources. Protection of water quality and watershed 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.

Some water development projects, such as impoundments, would need to consider changes in hydrology that might affect the timing of natural flows. This would influence where reservoirs are constructed in a watershed. Water improvements within the Platte River Watershed are restricted as a result of downstream water rights, which would influence the design, type, and cost of livestock water improvements. Consideration of these factors may limit some projects or increase the time period for planning. 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.

Soils management considerations would generally result in enhanced vegetative conditions through actions designed to reduce erosion, which would indirectly increase forage levels for livestock. Where the potential for accelerated erosion exists or where soil cover (vegetation and litter) may be improved, changes in the livestock season and duration of use would be required to improve vegetative cover and reduce impacts on soils. Effects on livestock operations would result from the implementation of grazing adjustments designed to protect vegetation and soil resources.

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 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 because requests for changes of livestock use would be altered or denied if the requested change conflicted with wild horse management objectives. Livestock and wild horse conflicts could also include damage to fences and the inability of livestock to access certain water sources.

Water developments designed to provide new water sources for wildlife in some situations would result in increased water availability for livestock, which would promote improved distribution of both livestock and wildlife. Large reservoirs capable of supporting fisheries provide a reliable source of water to livestock through drought periods. Protection of springs, seeps, and adjacent riparian areas from grazing animals provides cleaner and more dependable water sources for livestock.

Livestock management adjustments would be considered when wildlife and livestock conflicts arise as a result of competition for water, forage, or cover. In wildlife crucial habitat areas, livestock management adjustments would be implemented to reduce livestock impacts to wildlife. In addition, uneven distribution of big game causes some grazing allotments to receive a disproportionate amount of the total wildlife grazing within the planning area, which could necessitate adjustments in livestock management.

Modification of fences constructed prior to adoption of BLM standards (BLM Manual H-1741-1) may be needed. This may cause the permittees to increase fence maintenance and to ride the area more frequently to ensure livestock remain in the appropriate area, because fences designed for wildlife passage may be less effective in restraining livestock.

Sensitive wildlife habitats (i.e., Greater sage-grouse leks, prairie dog towns, and crucial winter range) would influence the location, timing of construction, and cost of range improvements. Fisheries actions, such as stream restoration and fish reintroduction, have the potential to reduce available forage through the construction of exclosures and riparian pastures. In addition, adjustments in livestock management, such as timing and duration of grazing, might be needed to ensure adequate fish habitat.

4.7.2 Impacts Under Alternative 1: Continuation of Existing Management

The use of fire for resource benefit would increase the size of wildland fires. Larger burned areas would decrease short-term forage availability and increase damage to range improvements. However, over the long term, forage availability and diversity would be increased. Livestock management problems associated with wildland fires (e.g., the need to modify grazing systems) would increase and thereby complicate livestock management over the short term.

Increased understory production occurs following timber harvest because increased sunlight reaches the herbaceous vegetation, which effectively increases available forage for livestock. Additional forage would be available for livestock grazing, which often improves distribution of use across an allotment. This would occur on about 25,000 acres over the long term. Timber harvesting activities require additional temporary roads and cause loud noises that would stress and relocate livestock.

Timber harvesting activities, such as sawing, skidding, and road building, displace livestock and remove forage. Noise associated with these activities stresses livestock, causing them to move away from these areas. Most roads and skid trails would be revegetated by natural processes, which would reestablish forage. Requiring intensive management of commercial timber harvest on 6,700 acres of land on steep slopes, riparian areas, and associated buffer zones would increase soil and vegetation stability on steep slopes and riparian areas, which could maintain or improve forage conditions in these areas.

Approximately 61,010 acres would be suitable for disposal, which if disposed, would reduce federal AUMs. However, most land disposals and land exchanges are on isolated tracts or checkerboard landownership areas. Therefore, the loss of lands and AUMs would be minimal. With the designation of ROW corridors, impacts from lands and realty would be reduced because less livestock forage would be lost to new authorized overlapping ROW actions.

Requiring adjustments to grazing operations to comply with the Wyoming Standards for Healthy Rangelands (BLM 1997) would affect livestock operators. These adjustments would include changes in season or duration of use, use of riparian pastures and exclosures, modifying forage utilization levels, and livestock conversions. New fence construction would decrease management complexity and indirectly help increase pasture and forage productivity.

Establishing the High Savery area as a vacant allotment would result in greater flexibility for the livestock grazing program, especially during drought years and to implement vegetation treatments. Any grazing would be carried out in accordance with the existing MOU.

Surface disturbance from oil and gas development would result in the loss of forage. However, reclamation of short-term disturbances would replace most of this forage. The RFO does not anticipate any permanent loss of AUMs as a result of this development; however, temporary adjustments of active use may be warranted. A total of 16,538 acres of long-term disturbances would result in the loss of approximately 1,860 AUMs. Short-term disturbances of 61,895 acres would result in a loss of approximately 7,020 AUMs. However, the total effect on AUMs would be short term and would be mitigated through the reestablishment of forage through reclamation efforts. In addition, these impacts would occur over a 20-year period and would be distributed across 30 or more allotments; thus, reducing the effects for any one livestock operator.

Mining of other leasable, common variety, and locatable minerals would result in surface disturbance, causing loss of forage and animal stress. Reclamation of these lands usually returns the grazing lands to production levels found prior to development.

Use of vehicles for necessary tasks would minimally decrease forage availability and palatability. OHV closures would total 22,490 acres. Closing areas to OHV use would preserve vegetation and forage in limited areas and reduce the noise and dust that would otherwise disturb cattle.

Treatments would occur on up to 56,000 acres of vegetation over the next 20 years, which would initially remove forage in treated areas but provide additional long-term forage. However, in spite of this existing level of acres treated annually, 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 in areas not treated.

Treatment of only 2,800 acres of invasive weeds per year (56,000 acres over 20 years) (including rangeland treatments and mitigation for surface disturbance) would control and contain the proliferation of invasive weed species and reduce established populations to acceptable levels, thereby maintaining forage production, diversity, and vigor in the treatment areas. Weed-infested areas would remain untreated on approximately 15,000 acres. Infested acreage would continue to result in a decline in forage production and devaluation of animal commodities. Continued proliferation of existing weed species or introduction of new weed species into new areas would continue to lower production and forage vigor. Untreated invasive poisonous plants would continue to injure and kill livestock. Livestock would be temporarily displaced during treatment activities, and grazing would resume after a short period of time. 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) may change the type, design, and/or location of proposed range improvements but not necessarily preclude development.

Special status plant species management would preclude grazing when exclosures are required to protect habitat. Currently, 15 acres are excluded from grazing to protect Gibbens' beardtongue (*Penstemon gibbensii)*. Management of Special Status Species may require changes in livestock management to improve the production and vigor of these species.

Summary

The introduction and proliferation of noxious and invasive weeds within individual allotments or localized areas would result in a significant loss of AUMs. Compounding this problem is the lack of sufficient weed treatments under this alternative. 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 reduced management flexibility.

Surface disturbing and other disruptive 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

Impacts from forest management and OHV management would be the same as those identified in Alternative 1, Section 4.7.2.

Placing emphasis on fire suppression efforts would possibly save forage for livestock grazing that would otherwise burn in wildland fires. Livestock management problems resulting from wildland fires would be less frequent, thereby easing livestock management. Protection of livestock grazing improvements would take precedence over the benefits of natural fire. However, over the long term, forage availability and diversity would potentially decrease, or in the very least not be improved.

Approximately 14,780 fewer acres would meet the FLPMA disposal criteria, 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 no net loss of livestock forage or 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 forage and AUMs to BLM, although administration issues would still be decreased because checkerboard and isolated lands would no longer need the attention of BLM.

Management actions under this alternative would increase the number of rangeland improvement projects from 45 to 55 projects, with emphasis on reliable water development projects, which would improve grazing distribution and reduce impacts during drought periods. Implementing intensive 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.

Establishing the High Savery area as a vacant allotment would result in greater flexibility for the livestock grazing program, especially during drought years and to implement vegetation treatments. Any grazing would be carried out in accordance with the existing MOU.

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

An increase in the acreage of vegetation treatments to 24,400 treated acres would result in increased forage availability and production. These benefits would be maintained over a longer period of time because of the larger size of individual treatments. Treatments would also help maintain early seral conditions in aspen stands, which would impact livestock grazing management by creating higher forage production in the upper portions of the watersheds. This would draw livestock into these areas, as forage would be plentiful and other desirable conditions would exist, such as shade and cover. Long-term benefits would include increased available forage and improved livestock distribution in the grazing area.

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 new weed species into new areas, until all areas received treatments. Also, treatment of poisonous plants would result in lower livestock injury and death.

The reduction in VRM Class II area (to 233,950 total acres) would allow greater flexibility in type, design, and/or location of proposed range improvements. However, reduced acreage in VRM Class II would potentially result in additional surface disturbing and other disruptive activities that would reduce forage available for livestock.

The removal of timing stipulations for big game crucial winter range, delineated big game parturition areas, raptor nest areas, and Greater sage-grouse and sharp-tailed grouse winter concentration areas would potentially allow for year-round construction of range improvements in these areas. The reduced distance stipulation and a more flexible timing stipulation for protection of nesting raptors would allow additional flexibility for construction of range improvements. However, the reduced restrictions on surface disturbing and other disruptive activities from elimination of wildlife timing stipulations and reduced NSO stipulations would result in decreased forage for livestock and increase the potential for noxious and invasive weed proliferation.

Summary

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 and other disruptive activities would increase long-term AUM loss to 1,880 AUMs, which would result in a 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 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 more areas requiring rest from livestock grazing to allow recovery of vegetation following a wildland fire, which would reduce the flexibility of short-term management. In some instances, fencing would be burned, which would require additional herding and fence maintenance in the short term.

Forest management actions would impact livestock grazing management by allowing natural succession to occur while managing for healthy forests, which would increase forage in most areas. Forage quality and quantity would be reduced where noncommercial conifer tree species are encroaching into old clear cuts, open conifer woodlands, dry meadows, and rangeland areas.

Impacts from lands and realty management would be similar to those identified in Alternative 1, except 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 no longer be accessible for grazing use.

Livestock operators would incur some additional management and complexity to meet DPC objectives. The emphasis of range improvement projects would shift to fence modifications and small-scale water developments, which would result in fewer new projects to benefit livestock and to help resolve grazing issues and meet objectives. Development of large-scale water projects in the Muddy Creek drainage would not be allowed, which would reduce the flexibility of management during periods of drought. Conversions of cattle or domestic sheep to bison would not be allowed in identified areas of blocked public lands for public safety. There are currently no bison permitted in these areas; however, one request has been made to run bison and cattle in this area. Restricting the type of livestock that managers can run in these areas would reduce the flexibility of livestock operations.

Establishing the Chain Lakes, High Savery, and Pennock areas (and other areas as they become available) as vacant allotments would result in greater flexibility for the livestock grazing program, especially during drought years and to implement vegetation treatments. Any grazing would be carried out in accordance with existing MOUs or management plans. This alternative would also increase the need for sheep herding where BLM standard fence is not adequate to control sheep.

The minerals management program would have similar impacts on livestock grazing as under Alternative 1, except fewer disturbances from oil and gas development would occur. Under this alternative a total of 15,489 acres of long-term disturbances would result in the loss of 1,730 AUMs. Short-term disturbances of 56,505 acres would result in a loss of 6,220 AUMs (800 fewer AUMs than under Alternative 1). However, the total effect on the number of AUMs would be short term and would be mitigated through the reestablishment of forage through reclamation efforts. In addition, development would occur over a 20-year period; therefore, forage losses would be spread incrementally over the planning period. However, reclamation of short-term disturbances would replace most of this forage. The RFO does not anticipate any permanent loss of AUMs as a result of this development; however, temporary adjustments of active use may be warranted.

OHV closures would increase to 71,450 acres, which is about 3 times the area under Alternative 1. Closing additional areas to OHV use would further preserve vegetation and forage in these areas and reduce the noise and dust that would otherwise disturb livestock.

Preservation of naturalness in the Adobe Town fringe areas (31,510 total acres) and the west end of the Ferris Mountains (5,270 total acres) would prevent construction of grazing improvements that would cause surface disturbance, thereby increasing the difficulty in managing livestock. Using the historic JO Ranch buildings in the Sand Hills ACEC as an interpretive site would increase public visitation and alter management of the ranch. Access to gathering and shipping facilities at the JO Ranch would potentially be denied to the livestock operators of the adjoining allotment, which would require construction of new facilities at another location.

Managing riparian areas to meet DPC. Management actions would increase woody plant structure and provide shade for grazing animals, as well as promote perennial grasses and sedges, which are desirable forage for cattle. Where livestock grazing inhibits riparian areas from meeting DPC, management changes would be needed. These changes could include altered season or duration of use or temporarily removing livestock from some riparian areas. In addition, livestock improvements, such as offsite water developments and fencing, may be required.

A fivefold increase in the number and acres treated by vegetation treatments to 11,800 acres per year would occur under this alternative 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 and increase operational cost to the livestock operator because treatments would be smaller and more frequent and subsequent deferment 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 in native, weed-free areas would maintain the usefulness of these communities for livestock management.

The large increase in VRM Class II acres (to 941,810 total acres) for the protection of historic trails would affect proposed range improvements needed for livestock management. 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. These actions may also increase construction and/or maintenance costs 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 to Alternative 1.

Prohibiting surface occupancy near 100-year flood plains and within 500 feet of perennial waters, and 100 feet from an inner gorge of an ephemeral stream would modify the locations of surface disturbing and other disruptive projects such as pits and reservoirs. This would increase the planning effort required for needed adjustments to grazing management. Prohibiting water developments over 1-acre feet of depletion in the Colorado River drainage would potentially reduce distribution or timing of livestock use when smaller, less reliable sources of water dry up or require development of different sources of reliable water (e.g., wells).

Provisions to protect municipal water sources in the Encampment River Watershed would result in more intensive grazing management in this area. However, these impacts would be minimal.

Actions identified as necessary to preserve the New World Iberian Genotype in the Lost Creek HMA could constrain future livestock management options within one allotment. These actions could include increases in the AML (approximately 165 adult wild horses), modification of existing or limiting new range improvements, and adjustments in existing livestock permits.

Prohibiting USDA Wildlife Services from animal damage control activities on the RMPPA would result in a reduction or elimination of sheep operations on public lands in 17 allotments because of unacceptable livestock loss by predation. This could result in an inability to use up to 20,000 to 30,000 AUMs for sheep. There would also be an increase in the loss of cattle to predation, especially during calving.

Range improvement construction would have increased limitations as a result of increased wildlife stipulations, which would result in slightly less flexibility in these areas, increased fence maintenance, and increased livestock herding as a result of placement of improvements in less desirable locations. In addition, livestock water developments would not be allowed if there were no associated wildlife benefits, water developments in big game crucial winter range would be prohibited, and new fences in migration corridors would not be allowed. These limitations would prevent some proposed improvements from being constructed and reduce management flexibility.

The reintroduction of Colorado River cutthroat trout (CRCT) and other native cold and warm water fish species could cause changes in livestock management in areas where these species would be reintroduced. Management and planning changes would include altering grazing season and duration of use, as well as construction of fenced 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 quality and quantity would be improved overall, as a result of substantial increases in both vegetation and weed treatments. Loss of forage use due to surface disturbing and other disruptive activities would be reduced from the level in Alternative 1 because of reclamation activities, weed control, and restrictions on surface disturbing and other disruptive activities from VRM Class II designations and wildlife management actions.

4.7.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from lands and realty management and wild horse management on livestock grazing would be the same as under Alternative 1.

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

Forest management actions under this alternative would impact livestock grazing management by eliminating from commercial timber harvest 6,700 acres of land on steep slopes, riparian areas, and associated buffer zones. This would further increase soil and vegetation stability on steep slopes and riparian areas, which could maintain or improve forage conditions in these areas. Timber harvesting activities require additional temporary roads and cause loud noises that would stress and relocate livestock.

Managing to meet DPC objectives would positively impact livestock grazing by providing shade in riparian areas within woody communities. However, there would be a reduction in forage availability and production. Where livestock grazing inhibits riparian areas from meeting DPC, management changes would be needed. These changes would include altered season or duration of use or temporarily removing livestock from some riparian areas.

Establishment of the Chain Lakes, High Savery Dam, and Pennock areas (and other areas as they become available) as vacant allotments would result in greater flexibility for the livestock grazing program, especially during drought years and to implement vegetation treatments. Any grazing would be carried out in accordance with existing MOUs or management plans. This alternative would also increase the need for sheep herding where BLM standard fence is not adequate to control sheep.

Impacts resulting from minerals management on livestock grazing would be less than those of 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 Alternative 1). However, the total effect on the number of AUMs would be short term and would be mitigated by the reestablishment of forage through reclamation efforts. This development and forage loss would be spread over the 20-year planning period. The RFO does not anticipate any permanent loss of AUMs as a result of this development; however, temporary adjustments of active use may be warranted.

OHV closures would increase to 33,500 acres, which is about 50 percent more area than under Alternative 1. Closing areas to OHV use would preserve vegetation and forage in limited areas and reduce the noise and dust that would otherwise disturb cattle.

Preservation of naturalness in the west end of the Ferris Mountains (5,270 total acres) would result in more restrictions for construction of grazing improvements that would cause surface disturbance, thereby increasing the difficulty in managing livestock.

In addition to impacts common to all from SMAs, development of an interpretive program for the historic JO Ranch in the Sand Hills ACEC would increase public visitation and may alter management of the rangeland for livestock grazing on those lands in close proximity to the JO Ranch headquarters. Access to gathering and shipping facilities at the JO Ranch would potentially be denied to the livestock operators of the adjoining allotment, which would require construction of new facilities at another location.

Vegetation treatments would increase to 16,400 acres and would emphasize meeting multiple-use objectives while providing for the protection of Special Status Species. In addition, meeting the DPC objectives would require additional management from livestock operators.

Treatment of 25,023 acres of weeds annually with an emphasis on outbreaks in native, weed-free areas would reduce competition with native plants. Some infested acreage would continue to result in a decline in forage production and devaluation of animal commodities. Treatments would target the introduction of new weed species into new areas, until all areas received treatments.

VRM Class II areas (589,530 total acres) would be slightly reduced, which would increase the flexibility in type, design, and location of proposed range improvements. However, the reduction in VRM Class II acreage would also increase the potential for surface disturbing and other disruptive activities that have the potential to eliminate healthy forage and introduce invasive and noxious weeds.

Management actions for the Encampment River Watershed would result in more intensive grazing management in this area to protect municipal water sources. However, these impacts would be minimal.

The reintroduction of CRCT and other native cold and warm water fish species could 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.

Summary

Long-term forage quality and quantity would be improved overall, as a result of substantial increases in both vegetation and weed treatments. However, these 5,000 to 7,000 acres would remain untreated, which would not slow the proliferation of existing weed patches.

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

4.8 MINERALS

This section presents potential impacts on minerals management 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) leasable 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.

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 8.x 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.

The analysis is based on the following assumptions:

- Oil and gas leasing and drilling would 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 includes 8,945 wells under Alternative 1; 9,198 wells under Alternative 2; 8,632 wells under Alternative 3; and 8,822 wells under Alternative 4 (Appendix 33).
- No substantial development potential is foreseen for locatable minerals.
- No reasonably foreseeable coal development is anticipated other than on existing leases in the Carbon Basin (see Section 4.20, Cumulative Impact Analysis). Reclamation will continue in the Hanna Basin from existing coal mining.
- Demand for salable minerals over the next 20 years would follow the rate of resource development in a given area.
- Area closures and surface use restrictions, including timing limitations stipulations (TLS), NSO, CSU, and no-lease restrictions, can be retroactively applied to existing valid oil and gas leases or other existing and valid use authorizations only through site-specific post-lease actions (e.g., APDs and ROWs) that are supported by project-specific NEPA analysis. Surface disturbing and other disruptive activities could still occur at existing authorized facilities, which could result in wildlife disturbance; degradation of visual quality, recreation values, and wilderness values; soil erosion; loss of livestock and wildlife forage; and loss of wildlife cover.
- RFDs and RFAs can be found in Appendix 33.

4.8.1 Impacts Common to All Alternatives

Leaseable Minerals—Oil and Gas

Protection measures for cultural resources eligible for listing on the NRHP generally include avoidance or other mitigation actions. These protective measures restrict, or in rare cases, prohibit oil and gas development that would otherwise adversely affect the cultural resources. If the NRHP-eligible cultural resource sites were small, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts. Avoidance measures occasionally require installation of facilities in areas that are more difficult to develop or reclaim which would potentially increase impacts to other resources.

Impacts to the visual setting of cultural resources, where the visual setting contributes to NRHP eligibility, would be intensively mitigated through avoidance or other restrictive actions. This would influence oil and gas developments that occur within the setting of historic properties by requiring mitigation measures as outlined in Appendix 5.

Wildland fires are expected to have a minimal and indirect impact on the development and production of oil and gas resources. Fire management within the RMPPA would concentrate fire suppression in areas with high resource or human value, including oil and gas developments. Fire management would benefit oil and gas production facilities by reducing fire danger.

Commercial forest management is expected to have negligible impact on oil and gas development and production activities because most commercial forestlands occur in low hydrocarbon potential areas.

Livestock grazing would have minimal impact on oil and gas development and production because grazing does not directly impact oil and gas operations. Oil and gas exploration and development within grazing allotments would require operators to abide by mitigation that would be specified in lease stipulations or the conditions of approval for those operations. Mitigation measures within grazing allotments would include providing for the upkeep and repair of fences and gates, preventing erosion, controlling invasive weeds, minimizing forage loss, and instituting measures to prevent loss or injury to livestock.

Oil and gas production would result in irreversible and irretrievable loss of the resources that are produced. Market fluctuations and increased costs associated with exploration, development, and operations may result in premature abandonment of individual wells that would decrease recoverability of the resource and could result in an irretrievable loss of the resource.

Development of other mineral resources could preclude oil and gas development over both the short term and long term. For example, natural gas exploration may target coal formations that could be mined. During the planning period, conflicts may arise between prior rights, such as coal leases and mines, and potential oil and gas lessees; however, the potential for this conflict is minimal. Development of locatable and salable minerals would have negligible or no impact on oil and gas exploration and production.

The impact of paleontological resource protection on oil and gas exploration and development is expected to be minimal. If important scientific fossils were discovered during an inventory conducted prior to surface disturbing activities, the resource would be managed according to BLM procedures. Avoidance of important paleontological resources would be accomplished in a manner similar to cultural resources, such as the relocation of access roads, drill pads, pipelines, and other ancillary facilities, which may require delays in developing the resource.

The impact of the management of WSAs on minerals management is expected to be minimal. WSAs (67,730 acres) are closed to federal mineral leasing (Map 2-6), which would preclude new oil and gas leasing and development. Approximately 27,050 acres of the WSAs have a moderate hydrocarbon potential and approximately 37,100 acres have a low hydrocarbon potential (Table 2-6).

Surface disturbing and other disruptive activities would be intensively managed in habitat for special status plant species (see Appendix 10), which could result in the relocation of locatable mineral facilities.

Surface disturbing and other disruptive activities would be intensively managed in all raptor concentration areas (RCA) (40,980 acres) and within the identified hibernaculum for the Preble's meadow jumping mouse from August 16 to May 14, which could, in some cases, result in the relocation of oil and gas facilities outside these areas. Surface disturbing and other disruptive activities would be prohibited in mountain plover habitat (1,468,990 subsurface acres) from April 10 to July 10, which would delay oil and gas development and exploration during this time and potentially require the location of facilities outside this area.

Leasable Minerals—Coal

Fire management actions would likely have minimal impact on reclamation activities at Hanna Basin. Fire occurrences would have the potential to consume vegetation and would increase the potential for soil erosion and the need for enhanced erosion control mechanisms. Coal reclamation would be delayed or impaired if wildland fires ignite coal resources.

Surface disturbing and other disruptive activities would be intensively managed in habitat for special status plant species (see Appendix 10), which could result in the relocation of locatable mineral facilities.

Locatable Minerals

Protection measures for cultural resources eligible for listing on the NRHP generally include avoidance or other mitigation actions. These protective measures restrict, or in rare cases, prohibit locatable minerals development that would otherwise adversely affect the cultural resources. If the NRHP-eligible cultural resource sites were small, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts. Avoidance measures occasionally require installation of processing facilities in areas that are more difficult to develop or reclaim, which would potentially increase impacts to other resources.

Impacts to the visual setting of cultural resources, where the visual setting contributes to NRHP eligibility, would be intensively mitigated through avoidance or other restrictive actions (Appendix 5). This would influence developments that occur within the setting of historic properties by requiring mitigation measures as outlined in Appendix 5.

To the extent forested surface may be present in locatable mineral mining areas, the resource is typically harvested in advance of mine development. Harvesting would have minimal indirect impact on the development of locatable minerals.

Lands and realty management actions would be minimal because mineral development occurs under the provisions of the 1872 Mining Law and the 43 CFR-3800, surface management regulations. Existing withdrawals of approximately 1,570,583 acres would limit the land available for locatable mineral entry.

If important scientific fossils were discovered during an inventory, the resource would be managed according to BLM procedures. Avoidance of important paleontological resources would be accomplished

in a manner similar to cultural resources, such as the relocation of mineral development facilities, which may require delays in developing the resource.

Surface disturbing and other disruptive activities would be intensively managed in habitat for special status plant species (see Appendix 10), which could result in the relocation of locatable mineral facilities.

Wildlife management actions that prohibit surface disturbing and other disruptive activities near threatened and endangered species habitat would directly limit the placement of locatable mineral developments.

Salable Minerals

Protection measures for cultural resources eligible for listing on the NRHP generally include avoidance or other mitigation actions. These protective measures restrict, and if necessary, prohibit salable mineral development that would otherwise adversely affect the cultural resources. If the NRHP-eligible cultural resource sites were small, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts. Avoidance measures occasionally require installation of facilities in areas that are more difficult to develop or reclaim, which would potentially increase impacts to other resources.

Impacts to the visual setting of cultural resources, where the visual setting contributes to NRHP eligibility, would be intensively mitigated through avoidance or other restrictive actions (Appendix 5). This would influence developments that occur within the setting of historic properties by requiring mitigation measures as outlined in Appendix 5.

Few lands and realty management actions would affect the availability of salable minerals. In the case of land sales or exchange, mineral materials would be transferred from federal ownership. In many instances, ROWs (roads, power lines, pipelines) would be placed to avoid mineral material sites or would result in only a minor loss of availability of mineral material. In some cases, ROWs or surface facilities could be relocated to allow access to salable minerals.

Development of minerals (i.e., oil and gas) would have immediate and localized impact on the development of salable minerals through the provision of construction materials for road and infrastructure development. In actuality, development of the other resources (i.e., oil and gas) would typically drive the demand for salable mineral resources.

Impacts from paleontological resource management actions on the development of salable mineral deposits would include avoidance or specific areas or the relocation of projects if paleontological resources were identified.

Surface disturbing and other disruptive activities would be intensively managed in all RCAs (40,980 acres) and within the identified hibernaculum for the Preble's meadow jumping mouse from August 16 to May 14, which would result in the location of facilities outside these areas. Surface disturbing and other disruptive activities would be prohibited in mountain plover habitat (1,468,990 subsurface acres) from April 10 to July 10, which would result in the location of facilities outside this area. Surface disturbing and other disruptive activities would be intensively managed in habitat for special status plant species (see Appendix 10), which could result in the relocation of locatable mineral facilities.

4.8.2 Impacts Under Alternative 1: Continuation of Existing Management

Leasable Minerals—Oil and Gas

The avoidance area established for surface disturbing activities within one-quarter of a mile of a cultural property, or the visual horizon, whichever is closer, would restrict oil and gas development that would otherwise adversely affect the cultural resources. If the NRHP-eligible cultural resource sites were small, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts. This avoidance measure could require installation of facilities in areas that are more difficult to develop or reclaim, or that are located farther from the mineral resource, which would potentially increase operating expenses.

Avoiding placement of new facilities, including linear ROWs, in areas identified in Chapter 2, Table 2-5, such as WSAs, ACECs, VRM Class II areas, and steep slopes, would directly influence the placement of oil and gas facilities, including well pads and pipelines. In most cases, the facility would be relocated outside the avoidance area. If the location cannot be avoided, the site would require BMPs, mitigation, siting, or design conditions of approval (Appendix 13) attached to the Application for Permit to Drill (APD). These mitigations would be applied based on a site-specific analysis on a project level. This management action would limit the location but not the number of oil and gas well pads within these areas.

Intensive management of oil and gas activities within one-quarter of a mile of incorporated boundaries of all cities (1,630 acres) could limit oil and gas production in these limited areas. Existing leases in these areas would be intensively managed to reduce noise, smell, and dust related to development activities.

Closing 66,120 acres to oil and gas leasing (i.e., lands classified as Oil and Gas Classification D, Map 2-35) would preclude new oil and gas leasing and development.

Developed and undeveloped recreation sites (10,400 acres) would be open to oil and gas leasing with a NSO stipulation and the surrounding ¼-mile area (an additional 7,930 acres) would be intensively managed, which could require directional drilling to access resources under larger recreation sites or result in location of facilities outside the closed area. Approximately 95 percent of these sites are within low hydrocarbon potential areas (Table 2-6).

SMAs provide management for unique natural, historic, scenic, or recreational resources and in all but one case are open to oil and gas exploration (with the exception of WSAs). The impact of SMA designations (Maps 2-7, 2-10, and 2-14), other than WSAs, on oil and gas exploration and production would depend on the special management designations, management actions, and hydrocarbon potential (Table 2-6). Restrictions or stipulations necessary to manage SMAs may lead to a reduction in the time available to drill and complete oil and gas wells and construct ancillary facilities; they may also result in the relocation of wells pads, access roads, pipelines, and ancillary facilities.

The Como Bluff ACEC (1,690 acres) would be open to oil and gas leasing with a controlled surface use (CSU) stipulation, which would directly influence the placement of oil and gas facilities (Map 2-7).

The Sand Hills ACEC (7,960 acres), Jep Canyon ACEC (13,810 acres), Chain Lakes wildlife habitat management area (30,470 acres), Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Caves SRMA (24,400 acres), Laramie Plains Lakes area (1,600 acres), Upper Muddy Creek Watershed/Grizzly area (70,780 acres), and White-Tailed Prairie Dog areas, would be open to oil and gas leasing with intensive management of surface disturbing and other disruptive activities. These management actions would result in location of facilities outside these areas (Map 2-7 and Map 2-10).

The Stratton Sagebrush Steppe Research Area ACEC (5,530 acres) would be open to oil and gas leasing with an NSO stipulation, which could require directional drilling and result in the relocation of oil and gas facilities.

An area within one-quarter of a mile, or the visual horizon, of the Cherokee and Overland trails would be open to oil and gas leasing and an avoidance area for surface disturbing and other disruptive activities. In most cases, the facility would be relocated outside of the avoidance area. If the location cannot be avoided, mitigation requirements could be attached to the APD.

The North Platte River SRMA (5,060 acres, including one-quarter of a mile either side of the river) would be open to oil and gas leasing with intensive management of surface disturbing and other disruptive activities, which would result in location of facilities outside the SRMA (Map 2-14).

Vegetation management impacts on oil and gas exploration and development would be minor and related to restoration of native species and/or avoidance of sensitive, threatened, and endangered plant species. Known habitat for threatened, endangered, proposed, and candidate species; and BLM Wyoming state sensitive plant species would be open to oil and gas leasing with intensive management, which could result in the relocation of oil and gas facilities.

In VRM Class II areas (359,610 acres), VRM objectives would influence the location of development as well as the size and coloration of facilities.

Avoiding surface disturbing activities in areas such as identified 100-year flood plains; areas within 500 feet of perennial waters, springs, wells, and wetland/riparian areas; and areas 100 feet from the inner gorge of ephemeral streams would directly impact oil and gas development. In most cases, the well pad or facility would be relocated outside the avoidance area. If the location cannot be avoided, the site would require BMPs, mitigation, siting, or design conditions of approval (Appendix 13) attached to the APD. These mitigations would be applied based on a site-specific analysis on a project level. This management action would limit the location but not the number of oil and well pads.

Water quality and watershed management actions place restrictions on the locations and methods for surface discharge of produced water, the placement of facilities, and the location and design of roads and well pads (Table 2-5). Surface discharge of produced water that meets state standards for water quality would be allowed in the Colorado River Basin, North Platte River Basin, and Great Divide Basin.

Seasonal restrictions for raptor nest sites, amphibian habitat, bald eagle communal roosts, prairie dog towns/complexes, and sage-grouse leks would restrict the time available to complete exploration and development activities. Where seasonal restrictions severely limit the time available to complete activities, relocation of surface facilities may be required. Approximately 3,494,490 subsurface acres would have seasonal restrictions, with 685,250 acres (20 percent) of the 3,494,490 acres identified as high hydrocarbon potential, 945,010 acres (27 percent) with moderate hydrocarbon potential, and 1,864,230 acres (53 percent) with low hydrocarbon potential (Table 2-6). Exceptions to seasonal restrictions would in some cases allow development activities to occur (Appendix 9. For deep wells that may take 6 or more months to drill, complete, and install production facilities, exceptions or phased operations would be necessary. Normal depth wells may require drilling and completion operations to be interrupted, and these activities would be completed in phases to accommodate the seasonal restrictions.

Locatable Minerals

Approximately 8,105 acres would be closed to locatable mineral entry in addition to the 1,582,260 acres of existing withdrawals, which would directly limit the amount of land available for locatable mineral

entry. Lands and realty management actions would not preclude locatable mineral development. ROWs would be relocated if locatable mineral exploration or development occurs.

Developed recreation sites (2,680 acres) would be closed to locatable mineral entry, which would limit the development of locatable minerals in these areas.

Identified blowout penstemon habitat would be open to locatable mineral entry, but would be intensively managed, which could result in the relocation of facilities.

Salable Minerals

The development of salable minerals is a discretionary action. Cultural resource management actions and vegetation management actions that protect special status plant species would require the relocation of salable mineral facilities.

Impacts from water quality, watershed, and soils management actions on salable minerals development would include shifting the locations of facilities and surface disturbing activities outside of protected resource areas (Table 2-5). Some salable mineral deposits would be unavailable where avoidance areas preclude development or where development could not be adequately mitigated. Loss of salable mineral development is likely to be minimal because the deposits selected for mining are generally located outside of floodplains.

Wildlife and fish management actions that restrict surface disturbing and other disruptive activities would result in the relocation of the activity or the use of alternate materials.

Summary

Leasable Minerals

Implementation of restrictions, such as NSO, CSU, and timing restrictions, would limit oil and gas development and activities. Approximately 8,945 wells would be developed during the planning period.

Locatable Minerals

Closing 8,105 acres to locatable mineral entry would limit the land available for locatable mineral development.

Salable Minerals

Approximately 8,105 acres would be closed to salable mineral disposals, which would limit the acreage available for disposals.

4.8.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Leasable Minerals—Oil and Gas

Management actions under Alternative 2 are less restrictive regarding surface disturbing and other disruptive activities, including oil and gas developments, as compared to other alternatives. These management actions would allow for greater development of oil and gas resources. Table 2-6, Alternative 2 shows the acres of hydrocarbon potential that would be affected by seasonal limitations.

Impacts from cultural resource management; recreation management; vegetation management; and water quality, watershed, and soils management would be the same as those of Alternative 1.

Impacts from avoiding placement of new facilities, including linear ROWs, in areas identified in Table 2-5, would be the same as those found in Alternative 1, except there are fewer acres of avoidance areas in Alternative 2.

Intensive management of oil and gas activities within one-quarter of a mile of incorporated boundaries of all cities (1,500 acres) could limit oil and gas production in these limited areas. Existing leases in these areas would be intensively managed to reduce noise, smell, and dust related to development activities.

Closing 66,610 acres to new oil and gas leasing (Map 2-36) would preclude new oil and gas leasing and development.

Impacts from SMA management actions discussed in Alternative 1 are also applicable to Alternative 2 (e.g., management of the North Platte River area would result in the relocation of oil and gas facilities from this area), except that the SMA management actions for Alternative 2 (Map 2-11 and Map 2-15) are less restrictive on oil and gas development than those for Alternative 1. Alternative 2 would provide for the greatest development of oil and gas resources as compared to other alternatives because less acreage would be subject to intensive oil and gas restrictions.

The Como Bluff area (1,690 acres) would be open to oil and gas leasing with a controlled surface use stipulation, which would directly influence the placement of oil and gas facilities.

The Sand Hills area (7,960 acres), Jep Canyon area (13,810 acres), Chain Lakes wildlife habitat management area (30,470 acres), Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Caves (24,400 acres), Laramie Plains area (1,600 acres), Upper Muddy Creek Watershed/Grizzly wildlife habitat management area (70,780 acres), and White-Tailed Prairie Dog areas, would be open with intensive management of surface disturbing and other disruptive activities. These management actions would result in the relocation of oil and gas facilities from these areas.

The Stratton Sagebrush Steppe Research Area ACEC (5,530 acres) would be open to oil and gas leasing and operators would be required to submit a management plan to describe how activities would affect research objectives. This management action could require the implementation of BMPs and mitigation measures to reduce impacts to the research area.

An area within one-quarter of a mile, or the visual horizon, of the Cherokee and Overland trails would be open to oil and gas leasing and an avoidance area for surface disturbing activities. In most cases, the facility would be relocated outside of the avoidance area. If the location cannot be avoided, mitigation requirements could be attached to the APD.

The North Platte River area (5,060 acres, including one-quarter of a mile either side of the river) would be open with intensive management of surface disturbing and other disruptive activities, which would result in the relocation of oil and gas facilities from this area.

The Rawlins OHV SRMA (480 acres) would be closed to oil and gas leasing, which would preclude new oil and gas development (Map 2-15).

In VRM Class II areas (233,950 acres), VRM objectives would influence location of development as well as size and coloration of facilities.

Proposed management actions to protect wildlife would impact oil and gas exploration and production as described under Alternative 1. Wildlife protection measures would be less restrictive, resulting in a lower magnitude and intensity of impact. Approximately 1,106,310 subsurface acres would have seasonal restrictions, with 172,410 acres (16 percent) of the 1,106,310 acres identified as high hydrocarbon potential, 349,310 acres (31 percent) with moderate hydrocarbon potential, and 584,590 acres (53 percent) with low hydrocarbon potential (Table 2-6).

Actions designed to protect wildlife would restrict the time and location of oil and gas development. Seasonal restrictions, such as prohibiting surface disturbing activities and other disruptive activities within one-half of a mile of raptor nests, would shorten the time period and land available for oil and gas development. Where seasonal restrictions severely limit the time available to complete activities, relocation of surface facilities may be required.

Locatable Minerals

Impacts from cultural resource management, recreation management, and vegetation management would be the same as those of Alternative 1.

Approximately 8,825 acres, or 720 acres more than Alternative 1, would be closed to locatable mineral entry, which would directly limit the development of locatable minerals.

The Shirley Mountain Caves area (240 acres) and Rawlins OHV SRMA (480 acres) would be closed to locatable mineral entry, which would directly limit the development of locatable minerals in this area.

Salable Minerals

Impacts from cultural resource management; recreation management; vegetation management; and water quality, watershed, and soils management actions would be the same as those of Alternative 1. Management actions under Alternative 2 are less restrictive on surface disturbing and other disruptive activities, including salable mineral activities, as compared to other alternatives; therefore more area would be open for mineral material disposals.

The Shirley Mountain Caves area (240 acres) and Rawlins OHV SRMA (480 acres) would be closed to mineral material disposals, which would directly limit the development of salable minerals. If alternate deposits exist, localized prohibition of mining may result in shifting the resource development activity to another location.

Wildlife and fish management actions that restrict surface disturbing and other disruptive activities would result in the relocation of the activity. Because authorization of mineral material sites is a discretionary action, it is anticipated that authorizations within sensitive habitats would be denied and alternative deposits or sites would be considered for development.

Summary

Leasable Minerals

More acres would be available for oil and gas leasing. In addition, fewer restrictions on surface disturbing and other disruptive activities would allow for more time to develop wells and construct facilities and may result in an increase of leasing and drilling activities. Approximately 9,198 wells, or 3 percent more wells than Alternative 1, would be developed during the planning period.

Locatable Minerals

Closing approximately 8,825 acres to locatable mineral development would limit the land available for development.

Salable Minerals

Approximately 8,825 acres would be closed to salable mineral disposals, which would limit the acreage available for disposals.

4.8.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Leasable Minerals—Oil and Gas

Management actions under this alternative would be the most restrictive to oil and gas development as compared to other alternatives.

Not allowing surface disturbing and other disruptive activities within one-quarter of a mile of a cultural property, or the visual horizon, whichever is closer would restrict oil and gas development that would otherwise adversely affect the cultural resources. If the NRHP-eligible cultural resource sites were small, access roads, drill pads, pipelines, and other ancillary facilities would be relocated to avoid adverse impacts. Not allowing surface disturbing and other disruptive activities in these areas could require installation of facilities in areas that are more difficult to develop or reclaim, which would potentially increase operating expenses.

Requiring NSO within one-half of a mile of incorporated boundaries of all cities (4,500 acres) would impact development activities by requiring directional drilling to reach mineral deposits or by precluding drilling where directional drilling is not a viable option. Existing leases in these areas would be intensively managed to reduce noise, smell, and dust related to development activities.

WSAs, ACECs, VRM Class II areas, steep slopes, and other areas identified in Table 2-5, would be closed to new facility placement, including linear ROWs. Closing these areas to facility placement would require directional drilling to reach mineral deposits or preclude drilling where directional drilling is not a viable option. This management action would limit the location and number of oil and gas well pads within these areas.

Approximately 120,360 acres would be closed to new oil and gas leasing (i.e., lands classified as Oil and Gas Classification D, Map 2-37).

Developed and undeveloped recreation sites (9,660 acres) and the surrounding ½-mile area (an additional 15,800 acres) would be open to oil and gas leasing with an NSO stipulation, which could require directional drilling to access resources under larger recreation sites or result in location of facilities outside the NSO area. This is approximately 8,600 acres more than Alternative 1.

The west end of the Ferris Mountains (5,270 acres) and the Adobe Town fringe areas (31,510 acres) would be closed to oil and gas leasing, which would preclude new oil and gas leasing and development.

Impacts from SMA management actions would be similar to those impacts identified in Alternative 1, except that the SMA management actions for Alternative 3 (Map 2-8, Map 2-12 and Map 2-16) are more restrictive and would constitute a major impact on oil and gas exploration and development. Alternative

3 management actions would be a major impact because more acreage would be subject to intensive oil and gas restrictions.

The Como Bluff ACEC (1,690 acres), Historic Trails ACEC, and Upper Muddy Creek Watershed/Grizzly ACEC (70,780 acres) would be open to oil and gas leasing with an NSO stipulation, which could require directional drilling and result in the relocation of oil and gas facilities.

The Sand Hills ACEC (12,700 acres), Jep Canyon wildlife habitat management area (13,810 acres), Stratton Sagebrush Steppe Research Area ACEC (5,530 acres), Chain Lakes ACEC (30,470 acres), Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Bat Cave ACEC (520 acres), and Laramie Plains Lakes ACEC (1,600 acres), would be closed to new oil and gas leasing, which would preclude new oil and gas leasing and development.

The White-Tailed Prairie Dog ACEC would be open to oil and gas leasing consistent with the habitat conservation measures outlined in the biological assessment, such that white-tailed prairie dog towns greater than 200 acres would be avoided. In most cases, facilities would be relocated outside the avoidance area. If the location cannot be avoided, the site would be assessed and mapped at the project level.

The North Platte River SRMA (12,740 acres, including one-half of a mile either side of the river) and Rawlins OHV SRMA (480 acres) would be closed to oil and gas leasing, which would preclude new oil and gas development (Map 2-16).

Known habitat for threatened, endangered, proposed, and candidate species and BLM Wyoming state sensitive plant species would be open to oil and gas leasing with an NSO stipulation, which could require directional drilling and result in the relocation of oil and gas facilities.

In VRM Class II areas (941,810 acres), VRM objectives would influence the location of development as well as the size and coloration of facilities. This increased VRM Class II acreage would require intensive management of surface disturbance.

Water resource restrictions on produced water disposal options in the Colorado River basin would impact the location of CBNG developments, and economic constraints could limit the ability to develop these natural gas resources.

Only State of Wyoming-authorized water discharges of produced water that meets specific BLM land use objectives would be allowed in the North Platte River and Great Divide Basins, which is more restrictive than Alternative 1. Restrictions on water disposal options would impact the location and number of developments of natural gas reservoirs located in coal formations, and economic constraints could limit the ability to develop these resources.

Not allowing surface disturbing activities in identified 100-year flood plains; areas within 500 feet of perennial waters, springs, wells, and wetland/riparian areas; and areas 100 feet from the inner gorge of ephemeral channels would directly impact oil and gas development. This management action would limit the location and number of oil and gas developments in these areas.

Actions designed to protect wildlife would restrict the timing and location of oil and gas development. NSO stipulations on raptor nests, big game parturition areas, threatened and endangered species habitat, and Greater sage-grouse and sharp-tailed grouse leks would impact development activities by requiring directional drilling to reach mineral deposits or by precluding drilling where directional drilling is not a viable option. Prohibitions on oil and gas development within 50 meters of prairie dog towns, within one-

quarter of a mile of sage-grouse leks, and in crucial winter range for sensitive species; closure of RCAs to leasing; and avoidance of sage-grouse leks (up to 4 miles of leks) within Atlantic Rim would also restrict development opportunities and thereby reduce the number of wells ultimately developed over the planning period. In addition, seasonal restrictions (e.g., nighttime prohibitions within one-quarter of a mile of Greater sage-grouse/sharp-tailed grouse leks from March 1 to May 15) would further impact minerals management activities. Proposed projects that are planned in areas containing big game species, raptors, and grouse habitat would have only a 2-month window for development; however, the presence of all of these habitats occurring on one proposed project area is not common. However, the wildlife program has modified the raptor seasonal timing stipulations to better reflect the biological needs of individual species, which has in some cases reduced the length of timing restrictions for proposed projects. Approximately 4,392,460 subsurface acres would have seasonal restrictions, with 880,090 acres (20 percent) of the 4,392,460 acres identified as high hydrocarbon potential, 1,234,730 acres (28 percent) with moderate hydrocarbon potential, and 2,276,640 acres (52 percent) with low hydrocarbon potential (Table 2-6).

Locatable Minerals

This alternative, when compared with the other alternatives, would restrict the greatest amount of locatable minerals development. Management actions would close 402,280 acres to locatable mineral entry. This is 394,170 more acres than Alternative 1. These management actions would directly impact development of locatable minerals in these areas.

Developed and undeveloped recreation sites (9,660 acres) would be closed to locatable mineral entry, and withdrawals would be pursued, which would directly limit the development of locatable minerals in these areas.

The west end of the Ferris Mountains (5,270 acres) and the Adobe Town fringe areas (31,510 acres) would be closed to locatable mineral entry, which would directly limit the lands available for locatable mineral development.

Impacts from SMA management actions would be similar to those impacts identified in Alternative 1, except that the SMA management actions for Alternative 3 are more restrictive for locatable mineral activity than those for other alternatives. The restrictions would limit areas available for locatable mineral development.

The Como Bluff ACEC (1,690 acres), Sand Hills ACEC (7,960 acres), Jep Canyon wildlife habitat management area (13,810 acres), Shamrock Hills raptor concentration area (18,400 acres), Chain Lakes ACEC (30,470 acres), Laramie Peak ACEC (18,940 acres), Red Rim-Daley ACEC (15,980 acres), Pennock Mountain wildlife habitat management area, Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Bat Cave area (520 acres), Laramie Plains Lakes ACEC (1,600 acres), Historic Trails ACEC, Blowout Penstemon ACEC (4,020 acres), Upper Muddy Creek Watershed/Grizzly ACEC (70,780 acres), White-Tailed Prairie Dog ACEC, High Savery Dam ACEC (530 acres), Continental Divide National Scenic Trail SRMA, North Platte River SRMA (12,740 acres including the ½ mile area either side of the river), and Rawlins OHV SRMA (480 acres), would be closed to locatable mineral entry, which would directly limit the development of locatable minerals in these areas.

Salable Minerals

Management actions under Alternative 3 are more restrictive on surface disturbing and other disruptive activities, including salable mineral activities.

Impacts from cultural resource management, SMA management, and vegetation management would be the same as those found in Alternative 1.

Developed and undeveloped recreation sites (9,660 acres) would be closed to salable mineral development, and the surrounding ½-mile area (15,800 additional acres) would be intensively managed, which would directly limit the development of salable minerals in these areas and could result in the location of facilities outside the closed area.

The west end of the Ferris Mountains (5,270 acres) and the Adobe Town fringe areas (31,510 acres) would be closed to salable mineral development, which would directly limit the development of salable minerals in these areas and could result in the location of facilities outside the closed area.

The Como Bluff ACEC (1,690 acres), Sand Hills ACEC (7,960 acres), Jep Canyon wildlife habitat management area (13,810 acres), Shamrock Hills raptor concentration area (18,400 acres), Chain Lakes ACEC (30,470 acres), Laramie Peak ACEC (18,940 acres), Red Rim-Daley ACEC (15,980 acres), Pennock Mountain wildlife habitat management area, Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Bat Cave area (520 acres), Laramie Plains Lakes ACEC (1,600 acres), Historic Trails ACEC, Blowout Penstemon ACEC (4,020 acres), Upper Muddy Creek Watershed/Grizzly ACEC (70,780 acres), White-Tailed Prairie Dog ACEC, High Savery Dam ACEC (530 acres), Continental Divide National Scenic Trail SRMA, North Platte River SRMA (12,740 acres including the ½ mile area either side of the river), and Rawlins OHV SRMA (480 acres), would be closed to mineral material disposals, which would directly limit the development of salable minerals. If alternate deposits exist, localized prohibition of mining may result in shifting the resource development activity to another location.

Water quality, watershed, and soils management actions on salable minerals development would result in shifting the locations of facilities and surface disturbing activities outside of protected resource areas (Table 2-5). Some salable mineral deposits would be unavailable where avoidance areas preclude development or development could not be adequately mitigated. Because some salable minerals operations produce water before and during mining, management of those resources would be impacted by water disposal restrictions.

Wildlife and fish management actions that restrict surface disturbing and other disruptive activities would result in the relocation of the activity or the use of alternate materials.

Summary

Leasable Minerals

Fewer acres would be available for oil and gas leasing. An increase in restrictions on surface disturbing and other disruptive activities would limit the time available to develop wells and construct ancillary facilities and may also result in greater costs associated with maximizing resource extraction. Implementation of this alternative may result in a decrease in leasing and drilling activities in the planning area. Approximately 8,632 wells, or 4 percent fewer wells than Alternative 1, would be developed during the planning period.

Locatable Minerals

Closing approximately 402,280 acres to locatable mineral development would limit the area available for development.

Salable Minerals

Approximately 402,280 acres would be closed to salable mineral disposals, which would limit the acreage available for disposals.

4.8.5 Impacts Under Alternative 4: Preferred Alternative

Leasable Minerals—Oil and Gas

Impacts from cultural resource management actions would be the same as those of Alternative 3.

Impacts from avoiding placement of new facilities, including linear ROWs, in areas identified in Table 2-5 would be the same as those found in Alternative 1.

Impacts from lands and realty management actions would be the same as Alternative 1, except no surface occupancy would be allowed within one-quarter of a mile of incorporated boundaries of all cities (1,630 acres). This management action would require directional drilling to reach mineral deposits or preclude drilling where directional drilling is not a viable option. Existing leases in these areas would be intensively managed to reduce noise, smell, and dust related to development activities.

Closing 76,950 acres to new oil and gas leasing (Map 2-38) would preclude new oil and gas leasing and development.

Developed and undeveloped recreation sites (9,660 acres) and the surrounding ¼-mile area (an additional 7,930 acres) would be open to oil and gas leasing with an NSO stipulation, which would require directional drilling to access resources under larger recreation sites or result in location of facilities outside the closed area. Approximately 95 percent of these sites are within low hydrocarbon potential areas (Table 2-6).

The west end of the Ferris Mountains (5,300 acres) would be closed to oil and gas leasing, which would preclude new oil and gas leasing and development.

Impacts from SMA management actions would be similar to those impacts identified in Alternative 1. The SMA management actions for Alternative 4 (Maps 2-9, 2-13, and 2-17) would be less restrictive than those of Alternative 3 and more restrictive than those for Alternative 2.

The Como Bluff national natural landmark (NNL), Sand Hills ACEC (7,960 acres), Jep Canyon wildlife habitat management area (13,810 acres), Chain Lakes area (30,470 acres), Wick-Beumee wildlife habitat management area (280 acres), Shirley Mountain Bat Cave ACEC (240 acres), Laramie Plains Lakes wildlife habitat management area (1,600 acres), Upper Muddy Creek Watershed/Grizzly fish habitat management area (70,780 acres), and White-Tailed Prairie Dog areas would be open to oil and gas leasing with intensive management of surface disturbing and other disruptive activates.

The area within one-quarter of a mile, or the visual horizon, of the Historic Trails Cherokee and Overland trails area would be open to oil and gas leasing with an NSO stipulation, which could require directional drilling and result in the relocation of oil and gas facilities.

The Stratton Sagebrush Steppe research area (5,530 acres) would be closed to new oil and gas leasing, which would preclude new oil and gas leasing and development.

North Platte River SRMA (5,060 acres, including the ¼-mile area on either side of the river) would be open to oil and gas leasing with intensive management of surface disturbing and other disruptive activates (Map 2-17).

The Rawlins OHV SRMA (480 acres) would be closed to new oil and gas leasing, which would preclude new oil and gas leasing and development (Map 2-17).

Known habitat for threatened, endangered, proposed, and candidate species would be open to oil and gas leasing with an NSO stipulation, which could require directional drilling and result in the relocation of oil and gas facilities. BLM Wyoming state sensitive plant species and blowout penstemon habitat would be open to oil and gas leasing with intensive management, which could result in the relocation of oil and gas facilities.

In VRM Class II areas (589,530 acres), VRM objectives would influence location of development as well as size and coloration of facilities. Water quality, watershed, and soils management actions would not allow the surface discharge of produced water in the Colorado River Basin. Water disposal options would affect the location of CBNG developments, and economic constraints could limit the ability to develop these natural resources. If surface discharges were allowed in the Colorado River Basin, water may need to be treated or impounded in off-channel reservoirs to limit salt loading in this basin. It is not known if the economics of these options would be better than injection. Exploratory projects in the Colorado River Basin are currently producing high volumes of produced water and using injection for water disposal. These projects have shown to be economically viable under current prices for natural gas but may not be where economics are marginal or consistent with changes in natural gas prices. This economic situation is expected to hold true in the future for most development. With these assumptions, impacts from water disposal options alone would not be expected to be significant under this alternative.

Surface discharge of produced water that meets state standards for water quality would be allowed in the North Platte River Basin and Great Divide Basin. Water disposal options would affect the location of CBNG developments, and economic constraints could limit the ability to develop these natural resources.

Avoiding surface disturbing activities in identified 100-year flood plains; areas within 500 feet of perennial waters, springs, wells, and wetland/riparian areas; and areas within 100 feet of the inner gorge of ephemeral streams would directly impact oil and gas development. In most cases, the well pad or facility would be relocated outside of the avoidance areas. If the location cannot be avoided, the site would require BMPs, mitigation, siting, or design conditions of approval (Appendices 13 and 27) attached to the APD. These mitigations would be applied based on a site-specific analysis on a project-level basis. This management action would limit the location but not the number of oil and gas well pads within these areas.

Impacts from wildlife and fish management actions would be similar to those of Alternative 1. There would be additional impacts to minerals management activities from NSO stipulations on raptor nests and Greater sage grouse/sharp-tailed grouse leks. In addition, activity is not permitted at night within one-quarter of a mile of a Greater sage-grouse/sharp-tailed grouse lek from March 1 to May 15, which could impact minerals management activities. Proposed projects that are planned in areas containing big game species, raptors, and grouse habitat would have only a 2-month window for development; however, the presence of all of these habitats occurring on one proposed project area is not common. Raptor seasonal timing stipulations were modified to better reflect the biological needs of individual species, which has in some cases reduced the length of timing restrictions for proposed projects. Approximately 3,517,990 subsurface acres would have seasonal restrictions, with 689,860 acres (20 percent) of the 3,517,990 acres identified as high hydrocarbon potential, 959,080 acres (27 percent) with moderate hydrocarbon potential, and 1,869,050 acres (53 percent) with low hydrocarbon potential (Table 2-6).

Proposals for conducting year-long surface disturbing and other disruptive activities, including oil and gas drilling in big game winter range, sage-grouse seasonal use areas, and other seasonally sensitive habitats would be considered and surface disturbing and other disruptive activities in big game crucial winter range would require the use of BMPs (Appendix 15). This would potentially allow for yearlong oil and gas activities in areas limited by seasonal limitations.

Locatable Minerals

Impacts from SMA management would be the same as those found in Alternative 1.

Management actions would close approximately 28,724 acres to locatable mineral entry, approximately 20,619 more acres than Alternative 1. These management actions would directly impact development of locatable minerals in these areas.

Developed and undeveloped recreation sites (9,960 acres) would be closed to locatable mineral entry and withdrawals would be pursued, which would directly limit the development of locatable minerals in these areas.

The west end of the Ferris Mountains (5,300 acres) would be closed to locatable mineral entry, which would directly limit the lands available for locatable mineral development.

The Shirley Mountain Bat Cave area (240 acres), portions of the Cherokee and Overland trails area, Blowout Penstemon ACEC (4,020 acres), High Savery Dam area (530 acres), Continental Divide National Scenic Trail SRMA, North Platte River SRMA (5,060 acres including the ¼-mile area either side of the river), and Rawlins OHV area (480 acres), would be closed to locatable mineral entry, which would directly limit the development of locatable minerals in these areas.

ACEC management actions would require plans of operations regardless of the acreage. The requirement would have minor to moderate impacts on the development of locatable minerals in these areas.

Identified blowout penstemon habitat would be closed to locatable mineral entry, which would limit areas available for locatable mineral development.

Salable Minerals

Impacts from cultural resource management; vegetation management; and water quality, watershed, and soils management would be the same as those found in Alternative 1.

Developed and undeveloped recreation sites (9,960 acres) would be closed to salable mineral development, and the surrounding ¼-mile area (7,930 additional acres) would be intensively managed, which would directly limit the development of salable minerals in these areas and could result in the location of facilities outside the closed area.

The west end of the Ferris Mountains (5,300 acres) would be closed to salable mineral development, which would directly limit the development of salable minerals in this area and could result in development of alternate deposits.

The Shirley Mountain Bat Cave area (240 acres), portions of the Cherokee and Overland trails area, Blowout Penstemon ACEC (4,020 acres), High Savery Dam area (530 acres), Continental Divide National Scenic Trail SRMA, North Platte River SRMA (5,060 acres including the ¼ mile area either side of the river), and Rawlins OHV area (480 acres), would be closed to mineral material disposals, which

would directly limit the development of salable minerals. If alternate deposits exist, localized prohibition of mining may result in shifting the resource development activity to another location.

Wildlife and fish management actions that restrict surface disturbing activities would result in the relocation of the activity or the use of alternate materials.

Summary

Leasable Minerals

There would be a slight decrease in the number of acres available for oil and gas leasing compared to Alternative 1. An increase in restrictions on surface disturbing and other disruptive activities would result in instances where less time is available to develop wells and construct facilities; this may also result in greater costs associated with maximizing resource extraction. Implementation of this alternative may result in a decrease in leasing and drilling activities in the planning area. Approximately 8,822 wells, or 1 percent fewer wells than Alternative 1, would be developed during the planning period.

Locatable Minerals

Closing approximately 14,465 acres to locatable mineral development would limit the area available for development.

Salable Minerals

Approximately 14,465 acres would be closed to salable mineral disposals, which would limit the acreage available for disposals in leased areas and would require that surface disturbance and facilities be intensively mitigated to retain VRM II visual qualities, which would improve the recreational experience.

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 long-term elimination or reduction of recreational OHV use in any area or compromise public health and safety.
- 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 planning area 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 beyond the ability of RFO to prevent or eliminate the problem.
- All restrictions apply to all permitted activities, but not necessarily to all casual use.
- 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

Cultural resources attract recreational OHV users to the RMPPA. This is evident from visitors interested in following the historic trails and visiting historic sites associated with the trails. Actions to protect cultural resources such as fencing, signing, physical barriers, or other methods of restricting access to sensitive cultural properties may preclude OHV use in some areas. Acreages within these areas would be minimal.

Fire management actions that affect the degree of wildland fire within the RMPPA would impact OHV use, as burn areas are not desirable OHV destinations. Trails established by fire management actions could become established two-tracks, creating new access to areas.

Windpower development in the RMPPA would negatively impact the OHV experience for some people by creating new visual impairments on the horizon. OHV access within these developments may be limited because of mixed land ownership patterns or road closures for public safety.

Fencing associated with livestock grazing may alter OHV travel patterns and interfere with access to potential OHV use areas. Livestock management actions would impact OHV users by creating new and maintaining existing roads and vehicle routes. Gates would be installed on new fences, where necessary, to provide adequate crossing on two-tracks or roads.

Mineral development would open new areas to OHV use. Increased traffic associated with mineral development would pose a hazard to OHV users, particularly on narrow roads that may not accommodate passing vehicles. Development associated with oil and gas facilities would degrade the scenic quality of areas surrounding development, resulting in many OHV users seeking alternate routes to avoid industrialized areas (i.e., the improved roads associated with development and the related impacts on the scenery from oil and gas facilities, equipment, vehicles, and personnel do not provide the rustic experience OHV users are typically seeking). Therefore development does not necessarily equate to an improvement in desirable OHV opportunities.

Excessive OHV use or use of over-the-snow vehicles could affect future OHV and over-the-snow vehicle users by forcing the closure of certain areas because of resource damage. In addition, increases in OHV use in certain areas could result in impacts to public safety.

Recreation use areas within the RMPPA would potentially increase OHV use, because some recreation attractions are unreachable without the use of OHVs. Recreation management actions would reduce OHV use opportunities through OHV closures in certain recreation areas to avoid user conflicts. 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 SMAs are popular OHV destinations in the RMPPA, whereas others restrict OHV use. The Ferris Mountains WSA (21,880 acres Map 2-5) would be closed to OHV use, along with the walk-in fishing area at High Savory Reservoir. The Pennock Mountain crucial elk winter range, Wick-Beumee wildlife habitat area, and Encampment River Canyon crucial bighorn winter range would be closed seasonally. Other SMAs do not have additional OHV restrictions (Map 2-10).

Any development of the transportation network within the RMPPA would affect OHV activities. Impacts would result from both road closures and the construction of new roads associated with development activities. Road closures and restricted access would limit OHV use in some areas; but the construction of new roads associated with mineral development would open new areas to OHV use. The improved roads associated with development and the related impacts on the scenery from oil and gas facilities, equipment, vehicles, and personnel do not provide the rustic experience OHV users typically seek. Therefore development would not necessarily equate to an improvement in desirable OHV opportunities.

Consolidation of public lands, particularly within the checkerboard area where public land is fragmented, would impact OHV use by increasing land available for OHV activities if legal public access is present.

Vegetative manipulation projects would impact OHV use by increasing restrictions in areas undergoing treatment, and limiting OHV use in these areas. Areas with sensitive and threatened or endangered species could be closed to OHV users, which would cause minimal impacts to OHV use.

Changes in VRM classes could impact OHV use. If an area were downgraded from Class II to Class III, the probability of surface disturbing development and associated roads would increase. If an area were upgraded to Class II, the probability of newly authorized roads would decrease. Watershed protection and restoration areas would potentially restrict the location of parking lots and roads or may lead to restrictive management of OHVs in sensitive areas. Source water and wellhead protection areas could restrict the location or development of future OHV use areas.

In some instances, soil characteristics, such as high clay or sand content, make an area 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.

4.9.2 Impacts Under Alternative 1: Continuation of Existing Management

In forested areas, such as the Shirley Mountains (Map 2-5), roads created for timber harvesting, firewood gathering, and similar activities would sometimes be available for OHV use. OHV use on logging roads would prevent natural reclamation of the roads, thus retaining them as OHV vehicle routes. These actions impact OHV use by changing the recreational OHV setting that many users seek; however, an expanded network of roads and vehicle routes would be created.

Development under minerals and transportation and access management would potentially impact OHV use in localized areas. The construction of facilities—including towers, fences, oil and gas development, wind turbines, and ROWs for pipelines, transmission lines, and communication lines—would alter the recreational OHV experience.

OHV use in the RMPPA increases during hunting season. OHV use on muddy two-tracks and roads would potentially create ruts that are hazardous to other drivers. Hunters often engage in this activity

because of the limited hunting seasons. Excessive damage could lead to temporary closure of these roads for rehabilitation, which would cause short-term impacts to OHV use.

Most OHV users would be satisfied with the abundance of two-tracks available throughout the RMPPA. The creation of unauthorized two-tracks would potentially impact all OHV users if areas were closed for rehabilitation from excessive resource damage. After a two-track has been pioneered, it is commonly considered existing by other OHV users and will remain a vehicle route unless it is signed as closed and/or rehabilitated. Under this alternative, two-track proliferation would continue and associated closures would impact OHV users.

Education and the distribution of OHV maps and user information would inform the public about proper OHV use and OHV regulations. Increased law enforcement presence could also serve to encourage proper OHV user behavior.

Creation of the 480-acre OHV area at Hogback Lake would have a positive, long-term impact on OHV management by providing OHV users with a designated OHV area. Creation of this area would help protect surrounding areas from new disturbance by concentrating OHV use within the OHV area. In particular, the OHV area would provide BLM with a forum for educating the OHV community regarding proper riding ethics and regulations.

Seasonal wildlife stipulations could decrease OHV use, particularly over-the-snow vehicles, because of a loss of opportunities in these areas during closure periods.

Summary

Short-term impacts would not be likely to limit OHV use. Resource development in the long term would increase traffic on roads and vehicle routes and potential use conflicts. Long-term impacts to OHV use would likely occur in sensitive resource areas as a result of road closures and restrictions.

Development of resources would impact OHV use in localized areas by altering travel patterns. Roads constructed for minerals development create conflicts between commercial vehicles and OHV users. These roads would open new areas to OHV use; however, the improved roads associated with development and the related impacts on the scenery from oil and gas facilities, equipment, vehicles, and personnel would not provide the experience OHV users usually seek.

4.9.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts to OHV management from forest management, lands and realty management, minerals management, OHV management, and recreation would be the same as those identified in Alternative 1.

Designation of the 480-acre OHV area located at Hogback Lake as a SRMA would have positive, long-term impacts on OHV management by providing OHV users with a designated open OHV use area. Creation of this SRMA would help to protect surrounding areas and other resources from new disturbance by concentrating OHV use within the SRMA. The SRMA would provide a forum for educating the OHV community regarding proper riding ethics and regulations.

Summary

Short-term impacts would be unlikely to limit OHV use. Accelerated resource development in the long-term would increase traffic on roads and vehicle routes and potential use conflicts. Long-term impacts to OHV use would likely occur in sensitive resource areas as a result of road closures and restrictions.

Accelerated development of resources would impact OHV use in localized areas by further altering travel patterns and access to OHV areas. Roads constructed for minerals development would create conflicts between OHV users and the commercial vehicles for which they were intended.

4.9.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts resulting from forest management and minerals management would be similar to those identified in Alternative 1. An emphasis placed on the protection of forest resources would limit vehicular traffic associated with timber harvest activities and reduce conflicts between OHV use and other vehicles.

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.

The Dune Ponds Cooperative Management Area would be closed to OHV use, which would eliminate the only off-road open play area in the RMPPA. This would cause some OHV users to travel to open areas outside the RMPPA.

Under this alternative, road densities would not be allowed to exceed levels that diminish or adversely affect other resources or resource values. This action could impact OHV use by closing areas to OHV use to rehabilitate roads and vehicle routes that exceed these levels.

The following SMA management actions would impact OHV management:

- Adobe Town WSA would be closed to OHV use (about 34,230 acres). These roads provide very little access to the WSA, so their closure would not seriously impact OHV use of the area, which primarily involves the use of boundary roads. Boundary roads would remain open.
- The Prospect Mountain (1,150 acres), Encampment River Canyon (4,470 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 opportunities in these areas. None of the routes extends more than three-quarters of a mile into the WSA, and thus does not provide a substantial OHV experience. Closure of these three WSAs would collectively be a reduction of approximately 4 miles of vehicle routes.
- Land tenure adjustments associated with actions specific to each SMA, including acquisition of lands, easements, or exchange, would impact OHV use by providing improved access where federal land is acquired. Access would be lost to disposed federal land, limiting OHV use in these areas.
- Vehicles used for authorized activities would be prohibited from driving off existing roads for necessary tasks in some SMAs.

- Big game seasonal closures to motor vehicle use would be implemented in the Sand Hills ACEC and proposed JO expansion (12,700 acres), which would cause a minimal impact on OHV use from a loss of opportunity in this area.
- The Sand Hills ACEC and proposed JO expansion (12,700 acres) and the Jep Canyon ACEC/wildlife habitat management area (13,810 acres on BLM-administered land) would be closed to over-the-snow vehicles, which would protect sensitive wildlife resources in the area; however, this would impact OHV use because of reduced opportunities for recreational winter OHV use in this area.
- Closures of specific roads and vehicle routes within the Upper Muddy Creek Watershed/Grizzly potential ACEC (70,780 acres) and White-Tailed Prairie Dog potential 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/Grizzly potential ACEC, which would cause temporary impacts to OHV use from a loss of opportunities during seasonal closures.
- The creation of the Rawlins OHV SRMA would have the same impacts as those identified under Alternative 2, except OHV use would be limited to designated roads and vehicle routes. There would be no open off-road OHV areas in the RMPPA. The "limited to designated" classification would enhance public safety and prevent resource degradation within the OHV area. This action would reduce the opportunity for an open OHV experience within the SRMA and throughout the RMPPA.

OHV and over-the-snow vehicle use would be closed in specific big game crucial winter range, as they are identified, thereby reducing winter OHV opportunities.

Summary

This alternative provides the greatest protection to resources that enhance the recreational OHV experience. However, because of these protections, many areas restrict or preclude OHV use, thus reducing OHV opportunities in the RMPPA. Based on the anticipated amount of roads and vehicle routes that would remain available to OHV use within the RMPPA, these impacts would be minor.

Impacts would occur to OHV users seeking open, unconfined OHV opportunities under this alternative because of the closure of the Dune Ponds Cooperative Management Area to OHV use. The Rawlins OHV area would be limited to designated roads and vehicle routes; therefore, there would be no open off-road play area in the RMPPA.

4.9.5 Impacts Under Alternative 4: Preferred Alternative

Impacts to OHV management from forest management, lands and realty management, minerals management, and wildlife and fish management would be the same as those identified in Alternative 1.

Impacts resulting from OHV management would be similar to those identified in Alternative 1, except that OHV use to retrieve big game kills and access camping sites would be allowed only within 300 feet of designated or existing roads and vehicle routes, which would reduce proliferation of new two-tracks, while still providing for limited game retrieval and camping opportunities.

The following SMA management actions would impact OHV management:

- The Prospect Mountain (1,150 acres), Encampment River Canyon (4,470 acres), and Bennett Mountains (5,960 acres) WSAs would be closed to all types of motorized vehicle use. Under this alternative, closure of these three WSAs would cumulatively be a reduction of approximately 4 miles of vehicle routes. This would result in a negligible reduction in OHV opportunities.
- Land tenure adjustments associated with actions specific to each SMA, including acquisition of lands, easements, or exchange, would impact OHV use by providing improved access where federal land is acquired.
- Big game seasonal closures to motor vehicle use would be implemented in the Sand Hills ACEC and Proposed JO Ranch Expansion (12,700 acres), which would cause minimal, short-term impacts to OHV use from a loss of opportunity in this area.
- The Sand Hills ACEC and proposed JO expansion (12,700 acres) and the Jep Canyon ACEC/wildlife habitat management area (13,810 acres on BLM-administered land) would be closed to over-the-snow vehicles, to protect sensitive wildlife resources in the area. This would impact OHV use because of reduced opportunities for winter OHV use in this area.
- Vehicles used for authorized activities would be prohibited from driving off existing roads for necessary tasks in some SMAs.
- Closures of specific roads and vehicle routes within the Upper Muddy Creek wildlife hhabitat management area (70,780 acres) would reduce the number of roads and vehicle routes available for OHV use, which would cause minimal, short-term impacts to OHV use from a loss of opportunity in this area.
- OHV and over-the-snow vehicle use would be closed in specific big game crucial winter range, as they are identified, reducing winter OHV opportunities.

Summary

Short-term restrictions would have minimal impact on OHV management. Resource development in the long term would increase traffic on roads and vehicle routes and potential use conflicts. To preserve some important resource values, OHV use would be limited or precluded in some areas. However, based on the anticipated amount of roads and vehicle routes that would remain available to OHV use within the RMPPA, these impacts would be minor.

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 ESRI's ArcGIS Desktop 8.x computer software, and information provided by other agencies and institutions. Effects are quantified where possible. In cases where quantitative data is 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.
- 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

Cultural resource management actions would protect paleontological resources from impacts related to surface disturbing and other disruptive activities. Restricting surface disturbing and other disruptive activities within one-quarter of a mile of cultural properties (if the setting contributes to NRHP eligibility) would lessen the potential for such activities to dislocate or damage paleontological resources that were not discovered prior to surface disturbance.

Surface disturbing and other disruptive activities associated with wildland fire suppression (e.g., construction of fire lines, bulldozing access roads, and general movement of heavy equipment), post-fire rehabilitation, forest management (e.g., forest health enhancement measures, harvesting of minor wood products, and commercial timber harvest), lands and realty management (e.g., roads, pipelines, power lines), minerals management (e.g., well pads, roads, pipelines), and transportation and access management have the potential to damage or dislocate 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. However, surface disturbance could also result in discoveries of previously unknown paleontological resources. The standard assessment and recordation procedures conducted prior to surface disturbing activities would serve to reduce the potential for adverse impacts and increase the database of known paleontological resources. Activities associated with lands and realty management would disturb approximately 5,790 acres (excluding minerals development) over the planning period.

Range improvements would increase erosion during construction and from livestock concentrations around water developments and trailing along fence lines, which in specific locations could negatively impact paleontological resources. Range improvements would be designed with full consideration of paleontological resources, thus impacts would be minimized to acceptable levels.

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. Frequent use of these

roads and vehicle routes would potentially damage paleontological resources that become exposed. The proliferation of unauthorized trails would decrease vegetative cover and increase erosion, leading to potential exposure, deterioration, and/or destruction of paleontological resources.

Paleontological resource management would emphasize protection of important scientific values. Paleontological resources would continue to be identified and studied through the promotion and facilitation of research by qualified individuals. Vertebrate fossils collection would be allowed via the Paleontological Resources Use Permit, ensuring the protection of fossil resources and any information gathered during the recovery process.

Protections afforded to SMAs (i.e., restrictions on surface disturbing or other disruptive activities) would protect paleontological resources located in these areas. ROW exclusion requirements and NSO stipulations would provide the greatest level of protection by prohibiting surface disturbing and other disruptive activities. However, restrictions on surface disturbing and other disruptive activities could also result in fewer identified, documented, and recorded paleontological resources because fewer paleontological resource assessments would be required. SRMA management that encourages recreation and development of facilities would impact paleontological resources directly through ground-disturbing activities and indirectly through the larger presence of human activity and corresponding potential increases in incidental or purposeful disturbance of paleontological resources. Direct impacts from BLM permitted surface disturbing and other disruptive actions would be mitigated by resource inventories, evaluations, avoidance, and data recovery procedures.

Restrictions on surface disturbing and other disruptive activities in VRM Class I areas (i.e., prohibition of surface disturbance) and Class II areas (i.e., retaining existing character of landscape) would protect paleontological resources in these areas by reducing the potential for damage to undocumented resources. However, restrictions on surface disturbing and other disruptive activities could also result in fewer identified, documented, and recorded paleontological resources because fewer paleontological resource assessments would be required.

Restrictions on surface disturbing and other disruptive activities in big game, waterfowl, amphibian, and federally listed species habitat would protect paleontological resources in these areas by reducing the potential for damage to undocumented resources.

4.10.2 Impacts Under Alternative 1: Continuation of Existing Management

Pursuing land acquisitions to preserve cultural resources would increase the amount of land under federal jurisdiction, which would provide protection, under federal management policies, to paleontological resources located in these areas.

Approximately 61,000 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 14,450 acres, which would result in closure of these areas to locatable mineral entry 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 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.

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. Designing livestock grazing systems to improve or maintain desired range conditions would maintain vegetative cover and soil stability and thereby prevent exposure and deterioration of paleontological resources.

It is anticipated that 8,945 oil and gas wells would be drilled over the 20-year planning period, 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. The standard assessment and recordation procedures conducted prior to surface disturbing and other disruptive activities would serve to reduce the potential for adverse impacts and increase the database of known 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 one-quarter of a 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 (2,680 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.

Surface use restrictions associated with the White-Tailed Prairie Dog area would indirectly protect paleontological resources located in these areas by reducing the potential for unanticipated discoveries and subsequent loss of scientific information. Intensive management would potentially restrict the amount and size of surface disturbance, decreasing the potential for damage to paleontological resources in these areas.

The area within one-quarter of a mile, or the visual horizon, of the Cherokee and Overland trails would be an avoidance area for surface disturbing activities. In most cases, proposed facilities would be relocated outside of the avoidance area. If the location cannot be avoided, mitigation requirements would be required to reduce the potential for impacts to paleontological resources.

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. This 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 vegetative cover, which would increase the potential for exposure and deterioration of paleontological resources.

Under Alternative 1, approximately 359,610 acres would be designated as VRM Class II, which could provide additional protection to paleontological resources located in these areas. Surface disturbing and other disruptive activities may be restricted in these areas because only a low level of change to the

characteristic landscape is allowed in VRM Class II areas. Therefore, some development activities may not occur, thereby reducing the potential for damage to paleontological resources.

Requiring that surface disturbing activities avoid identified 100-year flood plains; areas within 500 feet of perennial waters, springs, wells, and wetland/riparian areas; and areas within 100 feet of the inner gorge of ephemeral channels would provide additional protection to paleontological resources. This would reduce the potential for surface disturbing activities to dislocate or damage undocumented resources.

Avoidance or intensive management of surface disturbing and other disruptive activities in sensitive wildlife habitats would provide additional protection to paleontological resources located in these areas by reducing the potential for such activities to dislocate or damage undocumented resources. Paleontological resources would be completely protected in active raptor nests areas (19,230 acres) where surface disturbing and other disruptive activities are prohibited.

Summary

An anticipated 69,489 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 VRM Class I areas, SMAs, and NSO stipulations, 79,560 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 wildlife and fisheries management would also provide indirect protection to paleontological resources through avoidance and intensive mitigation of surface disturbing and other disruptive activities.

4.10.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The impacts to paleontological resources from recreation management; transportation and access management; and water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Impacts to paleontological resources from cultural resource management 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, increasing the potential for damage to paleontological resources located on lands that would have been acquired under Alternative 1.

Impacts to paleontological resources from lands and realty management would be similar to those identified in Alternative 1, except an additional 730 acres would be pursued for withdrawal. This would result in closure of these areas to locatable mineral entry and future disposal actions, thereby providing 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. 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 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.

Under Alternative 2, approximately 125,660 fewer acres would be designated as VRM Class II than under Alternative 1. This could result in increased surface disturbing and other disruptive activities on these lands, which would in turn increase the potential for damage to paleontological resources, as well as the potential for identification of undocumented resources.

Impacts to paleontological resources from wildlife and fisheries management would be similar to those identified in Alternative 1, except that restrictions on surface disturbing and other disruptive activities would be reduced in sensitive wildlife habitat areas. As a result, increased surface disturbance would occur over a larger area, thereby increasing the potential for damage to paleontological resources.

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 77,270 acres would be protected from surface disturbing and other disruptive activities as a result of VRM Class I areas, SMAs, 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.

4.10.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The impacts to paleontological resources from transportation and access management would be the same as those identified in Alternative 1.

Impacts to paleontological resources from cultural resource management would be similar to those identified in Alternative 1. However, prohibiting surface disturbing and other disruptive activities within one-quarter of a mile of historic properties where the setting contributes to the NRHP eligibility would indirectly protect all of the paleontological resources within those areas. This would ensure the preservation of the scientific information associated with those resources.

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 272,350 acres would be withdrawn from mineral location. Retaining all lands under federal jurisdiction would maintain protections associated with federal management policies. The withdrawal of 272,350 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 eliminating the possibility of placing undiscovered cultural resources outside of federal jurisdiction.

Impacts to paleontological resources from livestock grazing management would decrease, as compared to Alternative 1. The emphasis on small-scale as opposed to large-scale water developments would result in the disturbance of 480 fewer acres over the 20-year planning period. 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.

Impacts to paleontological resources from oil and gas development on 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 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.

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 ½-mile area (15,800 acres) would be subject to NSO stipulations. In addition, the Adobe Town fringe area (31,510 acres) would be closed to new oil and gas leasing, and surface disturbing and other disruptive activities on existing leases would be intensively managed to preserve naturalness in the area. 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.

Impacts to paleontological resources from SMAs would be similar to those identified in Alternative 1, except management of surface disturbance within SMAs would be more restrictive. Surface disturbance associated with new oil and gas leases would be prohibited in the Como Bluff ACEC (1,690 acres). Surface disturbing and other disruptive activities would be prohibited within 164 feet of white-tail prairie dog towns within the White-Tail Prairie Dog ACEC. These actions would increase protection of paleontological resources by reducing the level of surface disturbance that would be allowed within these areas.

The Historic Trails ACEC would be expanded to include the Rawlins to Baggs and Rawlins to Fort Washakie Freight Roads, increasing the ACEC acreage by about 25,000 acres. Surface disturbing and other disruptive activities would be prohibited within the ACEC, which would reduce the potential for damage to paleontological resources located in these areas.

Impacts to paleontological resources from VRM management would be similar to Alternative 1, except an additional 582,200 acres would be designated as VRM Class II. This could result in decreased surface disturbing and other disruptive activities on these lands, which would in turn decrease the potential for damage to paleontological resources, as well as the potential for identification of undocumented resources.

Impacts to paleontological resources from water quality, watershed, and soils management would be similar to those impacts identified in Alternative 1, except surface disturbing activities would be prohibited in identified 100-year flood plains; areas within 500 feet of perennial waters, springs, wells, and wetland/riparian areas; and areas within 100 feet of the inner gorge of ephemeral channels. This would eliminate the potential for damage to paleontological resources in these areas from surface disturbing activities, as well as the potential for identification of undocumented resources.

Impacts to paleontological resources from wildlife and fisheries management would be similar to those identified in Alternative 1, except that restrictions on surface disturbances would increase in sensitive wildlife habitat areas. The amount of area with surface disturbance prohibitions would increase to include active raptor nest areas, big game parturition areas, and Greater and sharp-tailed sage-grouse leks (plus a ¼-mile buffer); and a greater number of areas would be avoidance areas for surface disturbing and other disruptive activities under this alternative. This would eliminate or reduce (depending on restrictions) the potential for damage to paleontological resources from surface disturbing and other disruptive activities, as well as the potential for identification of undocumented 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 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 VRM Class I areas, SMAs, and NSO stipulations, 425,280 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.

4.10.5 Impacts Under Alternative 4: Preferred Alternative

Impacts to paleontological resources from cultural resource management would be the same as those identified in Alternative 3.

Impacts to paleontological resources from fire and fuels management; livestock grazing management; transportation and access 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 an additional 6,790 acres would be pursued for withdrawal. This would result in closure of these areas to locatable mineral entry and future disposal actions, thereby providing 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. 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.

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 disturbed acres would decrease the potential for inadvertent damage to previously unknown resources, as well as the potential for identification of paleontological resources.

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 ¼-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 of SMAs would be similar to those identified in Alternative 1, except surface disturbing activities would be prohibited within one-quarter of a mile, or the visual horizon, of the Cherokee and Overland trails. These actions would increase protection to paleontological resources by reducing the level of surface disturbance that would be allowed within these areas.

Impacts to paleontological resources from VRM management would be similar to Alternative 1, except an additional 230,810 acres would be designated as VRM Class II. This could result in decreased surface disturbing and other disruptive activities on these lands, which would in turn decrease the potential for damage to paleontological resources, as well as the potential for identification of undocumented resources.

Impacts to paleontological resources from wildlife and fisheries management would be similar to those identified in Alternative 1, except that restrictions on surface disturbances would increase in sensitive wildlife habitat areas. The amount of area with surface disturbance prohibitions would increase to include active raptor nest areas and Greater and sharp-tailed sage-grouse leks (plus a ¼-mile buffer); and a greater number of areas would be avoidance areas for surface disturbing and other disruptive activities under this alternative. This would eliminate or reduce (depending on restrictions) the potential for damage to paleontological resources in these areas from surface disturbing and other disruptive activities, as well as the potential for identification of undocumented 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 VRM Class I areas, SMAs, and NSO stipulations, 225,830 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.

4.11 RECREATION RESOURCES

This section presents potential impacts to recreation resources from other management actions. Recreational uses or 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 planning area 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 beyond the capacity of BLM RFO to prevent the problem.
- Restrictions apply to permitted activities, but not necessarily to casual use.
- 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 restrict or preclude the development of recreational facilities and opportunities in localized areas. Management actions involving interpretive programs, signage, markers, and other elements for historic trails, other historic sites, and important prehistoric sites would enhance recreational experiences and increase public awareness.

Temporary closures during wildland fire incidents would prevent recreational use, which would cause short-term impacts to recreational opportunities in these areas. Generally, areas where wildland fires have occurred would temporarily be undesirable places to recreate, until they were revegetated. These impacts would be minor.

Windpower development in the RMPPA would impact the recreational experience for some people by creating new visual impairments on the horizon. Access within these developments may limit recreational opportunities because of mixed land ownership patterns or road closures for public safety.

Land consolidation is important to improving access in the checkerboard, intermingled lands, and the North Platte River. Increased access to the North Platte River would expand the recreational opportunities within the RMPPA and enhance a visitor's perception of solitude by further dispersing river users. Land exchange would facilitate increased public access to other desired recreation resources.

Livestock management actions would include the implementation of the Wyoming Standards for Healthy Rangelands (BLM 1997), this requires meeting standards for vegetation health, wildlife habitat, and riparian habitat, which would reduce impacts to recreation by maintaining hunting, fishing, and wildlife viewing opportunities. Fencing associated with livestock grazing may alter recreational access and use patterns. Installation of adequate signing and gating would help prevent conflicts and trespass. Water development projects for livestock would provide sources of nonpotable water in areas where no other water would be available along recreational trails. Livestock grazing and range improvement projects would change recreational experiences for some individuals.

The network of roads, well pads, and other facilities, in combination with heavy equipment and truck traffic associated with minerals management activities, has an impact on recreation uses. The associated displacement of some wildlife species and degradation of scenic quality make these areas less desirable for recreation activities. Common variety and locatable mineral development and the associated surface disturbance impacts on recreation would generally be localized and short term.

OHV use enhances recreational opportunities by facilitating access to recreation areas inaccessible to ordinary street vehicles. Some direct, short-term effects from OHV-produced noise and decreased air quality would diminish the recreational experience for other recreationists who seek solitude and natural settings for camping, hiking, and related recreational activities.

Constructing a 480-acre designated play area for OHV use at Hogback Lake, near Rawlins, would provide OHV enthusiasts a fenced area for skill development without conflicts with recreationalists involved in nonmotorized activities. Concentrating OHV use to the fenced area would help reduce the proliferation of new illegal routes in the Washakie Basin and provide BLM with a forum to educate the public on rider ethics and regulations.

Congestion in recreation areas and conflicts between various recreationists, such as motorized and nonmotorized, would affect the quality of the recreational experience.

Special Recreation Permits (SRP) are required for commercial uses, competitive events, organized groups, and some special area uses, per 43 CFR 2930. The RFO administers approximately 55 SRPs. Of these, approximately 75 percent are for outfitting hunting, 20 percent are for floating/fishing, and 5 percent are for other recreational activities such as wild horse viewing and horseback riding. The majority of these outfitters provide day use service only. If unacceptable adverse impacts were to occur from outfitter uses, or from a substantial increase in issued permits, BLM would reduce the number of permits issued, reducing the opportunity for guided recreation opportunities.

Special protections and enhancements in SMAs may increase visitation, particularly if their attributes are publicized. WSAs serve as an attractive location for recreation users seeking primitive recreational opportunities, as do certain wildlife-related SMAs that would benefit hunting, fishing, and wildlife viewing opportunities. SRMAs are designated to protect certain unique characteristics for the purpose of recreation, thus providing a significant benefit to recreationists.

The improvement of the transportation network for the RMPPA would facilitate access to recreational areas. Recreational activities would be impacted by both road closures and the development of roads associated with mineral development and other resource uses.

Source water and wellhead protection areas would restrict the location or development of future recreational facilities. Management actions associated with protecting water quality, watershed, and soils susceptible to erosion could also dictate the design and use of recreational facilities and the types of recreational activities allowed in some areas, which could impact recreation opportunities and experiences in certain areas.

Protecting water sources for campground facilities would enhance recreational opportunities by providing safe drinking water. Water and watershed activities indirectly protect existing flow conditions that affect floaters and fishermen. Protecting water quality and fish habitat conditions would protect or improve game fisheries, thereby improving fishing opportunities. Some water development projects, such as reservoirs, may add new opportunities for fishing or camping.

Protection of sensitive soils could restrict or exclude recreational activities such as camping, OHV use, and horseback riding, reducing recreation opportunities in these areas.

4.11.2 Impacts Under Alternative 1: Continuation of Existing Management

Timber harvesting (approximately 25,900 acres would be available for commercial timber harvest) would displace recreationists, causing long-term impacts from a loss of recreational opportunities in forested areas. Timber harvesting would potentially improve habitat conditions for some desirable game species of interest to recreationists, which would impact hunting and wildlife viewing opportunities in these areas.

Access acquisitions and land tenure adjustments through exchange would facilitate greater access to recreational areas and reduce conflicts between recreationists and landowners within the RMPPA. This action, combined with the continued protection of existing recreation resources by the establishment of ROW avoidance areas and exclusion areas, could result in an increase in available recreational opportunities.

Livestock management actions would impact recreation by creating new and maintaining existing roads and vehicle routes, which would increase easily accessible areas. New fences would have appropriate gates installed unless a specific area's recreation management would benefit from a road or trail closure, for the protection of resource values and/or public safety concerns. Conversions from cattle or sheep to

domestic bison would occur in areas, which potentially would cause risk to recreationists from bison in block federal ownership.

The minerals management program would alter the recreational setting by creating increases in site-specific noise levels, artificial illumination from night drilling operations, traffic volume, and road density. Alteration of wildlife habitats would potentially reduce wildlife viewing and hunting opportunities.

Increased road densities and route proliferation would impact recreation by degrading the recreation experience for those desiring natural settings, such as recreationalists involved in nonmotorized activity. Increased road densities result in a greater potential for motorized/nonmotorized conflicts.

Mineral activity and potential surface disturbance occurring in the Adobe town fringe areas (31,510 acres) and the west end of the Ferris Mountains (5,270 acres) would cause long-term impacts from a loss of opportunity for recreationists seeking a primitive and unconfined recreation experience in these areas.

Allowing motorized access only on designated roads in the Adobe Town WSA would reduce the impacts of motorized travel and route proliferation within the WSA. Existing routes extend no further than three-quarters of a mile into the WSA, so closure would not significantly reduce access to the interior.

The Jep Canyon ACEC/Jep Canyon wildlife habitat management area and the Shamrock Hills ACEC would be open to locatable mineral entry under CFR 3809, which would affect recreation management by causing impacts to wildlife of recreational value.

Protection of the High Savery Dam and reservoir site, developing part of the site as a recreational fishery, and closing the area to OHV use would enhance and protect fishing opportunities in the area.

The Encampment River WSR designation would protect the river corridor in the event that Congress releases the WSA from wilderness consideration. The WSR designation would preserve the recreational experience along the river corridor.

Short-term impacts from vegetation treatments would cause recreationists to be displaced from denuded areas to other more desirable areas until revegetation occurs. The long-term effects of the vegetative treatments would enhance the recreational experience by improving the aesthetics of an area. Closures during prescribed burns would temporarily prohibit recreational use, but management of vegetative resources through fire and prescribed burns would often improve range conditions and wildlife habitat to the benefit of recreationists, especially for hunters and wildlife observers.

VRM restrictions and considerations on surface disturbing and other disruptive activities protect the viewshed and aesthetic quality of an area, which would benefit recreationists. VRM classes within the RMPPA are depicted in Table 2-9.

The size and health of wild horse herds would directly affect the recreational experience of wild horse viewing. If herds are too large, the overall health of the herd declines, and though viewers may easily find the herds, they would be in poor condition. If the herds were too small, they would be in excellent condition, but would be difficult for recreational viewers to find. The proposed management would reduce the potential for either of these impacts.

The protection and improvement of wildlife and fish habitat would directly benefit recreation resources and would potentially increase recreational visitation associated with fishing, hunting, and nonconsumptive wildlife uses.

Summary

Indirect impacts to recreation would occur because of reduction in, or impacts to, wildlife and fisheries habitat, which would reduce recreational opportunities, such as hunting and wildlife viewing in some areas.

Increased road densities and route proliferation would impact recreation by altering the recreation experience for those desiring natural settings, such as recreationists involved in nonmotorized activities. Increased road densities result in a greater potential for motorized/nonmotorized conflicts and increase access in some areas.

4.11.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on recreation resources from OHV management, recreation management, SMAs, and wild horse management would be the same as those identified in Alternative 1.

Impacts on recreation from timber harvest activities would be similar to those identified in Alternative 1. The design of timber sales to maximize commercial timber harvest could, for the short term, temporarily impair improvement of habitat conditions for some desirable game species of interest to recreationists, which would impact hunting and wildlife viewing opportunities in these areas.

Impacts from lands and realty management action would be similar to those identified in Alternative 1. Utility/transportation systems would be developed outside the areas listed in Table 2-5. Impacts from these developments would create changes in the outdoor recreational experience by altering access patterns and temporarily displacing wildlife-related recreational opportunities. However, with the designation of ROW corridors (Alternative 2), these impacts would be reduced.

Impacts from livestock management would be similar to those identified in Alternative 1.

The minerals management program would have similar impact on recreation management to those of Alternative 1, except impacts to recreation opportunities resulting from oil and gas development activity would be increased.

Acquiring legal access only when opportunities arise, as opposed to being actively pursued, would reduce the potential to expand recreational opportunities in certain areas.

The effects of vegetation management would be greater and occur over more of the area under this alternative than Alternative 1, because of the effect that vegetative treatments have on recreational experiences. Vegetation treatments would be larger and fewer in number, which would enhance commodity production in localized areas. These short-term impacts would cause recreationists to be displaced until revegetation occurs.

VRM Class II acreage would be reduced around Seminoe and Pathfinder Reservoirs and eliminated in the Shirley Mountains and the area of the RMPPA with a checkerboard land ownership pattern. The total reduction in VRM Class II acreage under this alternative would be 125,660 acres. Changing checkerboard land pattern areas to VRM Class III would have minimal effect on recreationists, because they do not have legal public access to these areas and development is uncontrolled on the private sections, which makes visual management impossible. The recreation experience in the other downgraded VRM areas, which do not meet the criteria for VRM Class II, would be affected only if development were to occur.

Under Alternative 2, Class IV acreage would be increased by 224,150 acres, most of which is already visually impacted by development. Therefore, the change in VRM class would not affect the recreational experience.

The wildlife and fish management program would have impacts similar to those of Alternative 1.

Summary

Similar to Alternative 1, indirect impacts to recreation would occur because of reduction in, or impacts on, wildlife and fisheries habitat, which would reduce recreational opportunities, such as hunting and wildlife viewing in some areas.

Also similar to Alternative 1, increased road densities and route proliferation would impact recreation by altering the recreation experience for those desiring natural settings, such as recreationists involved in nonmotorized activities. Increased road densities result in a greater potential for motorized/nonmotorized conflicts and increase access in some areas.

Increased mineral development activities would displace recreationists. Forest and vegetation management activities would displace recreationists in timber harvesting areas.

4.11.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts on recreation resources from vegetation management would be the same as those identified in Alternative 1.

Actions under this alternative would benefit recreationists because of improved forest health. No commercial timber harvesting would be permitted, which could have negative and positive impacts. The increase in the construction of temporary logging roads would not occur, reducing impacts on recreationists seeking more primitive recreation opportunities. Improved forest health would benefit wildlife in forested areas, which would improve hunting and wildlife viewing opportunities.

This alternative would provide the most protection to recreation areas, primarily because withdrawal areas from mineral leasing would include recreation sites (approximately 1,696 acres), historic sites (approximately 79,446 acres) and habitat management areas (approximately 130,086 acres). Withdrawals in these areas would facilitate protection of recreation resources and other resources that are important to recreation, such as historic trails and stage stations that are attractions to recreationists, and wildlife habitat management areas that would improve hunting and wildlife viewing opportunities. Exchange for nonfederal lands in SMAs would be considered to enable land consolidation within these areas. Impacts from designated ROW corridors would be the same as those under Alternative 2.

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 have indirect, long-term impacts on recreation through improvement of these natural resources, for instance improving water quality for water-based recreation activities and improving wildlife habitat, which would benefit hunting and wildlife observation. Conversions from livestock to domestic bison would not occur in areas of blocked federal surface land ownership, which reduce the potential risk to recreationists from bison.

This alternative would provide the most protection to recreation from conflicting mineral development activities because restrictions would reduce activity, and a greater amount of area would be subject to

NSO stipulations or closed to mineral leasing. This would have a long-term impact on recreation because these areas would be available to recreational use, and fewer conflicts would occur.

Mineral leases that are issued would include stipulations that would protect visual resources, wildlife areas, historic trails, SRMAs, and other areas that have important recreation values. Recreation resources including wildlife habitat and riparian areas would have long-term protection.

Limitations on dispersed camping and big game retrieval using vehicles would protect the scenic value of some areas but would also limit some camping opportunities and could make big game retrieval more difficult for some hunters. Other resources would be protected from excessive disturbance, road/route/trail proliferation, and human encroachment. This would help reduce the conflicts between motorized and nonmotorized recreationists.

Preservation of the naturalness in the Adobe Town fringe areas (31,510 total acres) and the west end of the Ferris Mountains (5,270 total acres) would provide outstanding opportunities for continued primitive and unconfined recreation.

This alternative would provide the most protection to SMAs. The protections that would be afforded to SMAs would benefit recreation, primarily because a greater amount of area within the SMAs would be subject to surface disturbance restrictions, withdrawals from mineral development, and active pursuits of land tenure adjustments. These actions would have long-term impacts as a result of the reduced probability of user conflicts and enhanced recreational opportunities.

Encampment River Wild and Scenic River designation would protect the river corridor in the event that Congress releases the WSA from wilderness consideration. The WSR designation would preserve the recreational experience along the river corridor.

Areas surrounding the Continental Divide National Scenic Trail would be classified as an area of high importance for pursuing legal access. This would provide greater access to recreational opportunities and would benefit recreationists.

This alternative would provide the most protection for watersheds, riparian areas, and water quality. These actions would provide long-term benefits to recreation, especially water-based recreation activities and improved wildlife habitat, which would benefit hunting, camping, and wildlife viewing.

VRM Class II acreage would be reduced around Seminoe and Pathfinder Reservoirs and eliminated in the Shirley Mountains and the area with checkerboard land ownership patterns. VRM Class II acreage would be increased by 582,200 acres with the historic trail viewshed (for contributing segments) and lands with wilderness characteristics that are adjacent to the Adobe Town fringe areas (31,510 acres) and the west end of the Ferris Mountain (5,270 acres) WSA. The viewshed around the Ferris Mountains (79,700 acres), the JO Ranch area (1,400 acres), and the North Platte River SRMA (12,740 acres) would also be designated as VRM Class II areas. This significant increase in Class II VRM acreage (totaling 941,810 acres) would protect a far greater portion of the RMPPA from visual intrusions, which would enhance the experience for various recreational activities.

VRM Class II areas would be increased by 582,200 acres compared with Alternative 1. The bulk of this increase would be along historic trails and around the Ferris Mountain and Adobe Town WSAs. Although a portion of this new Class II area is in existing minerals development areas, most of it is in relatively undeveloped areas of the RMPPA. VRM Class II designation in leased areas would require that surface disturbance and facilities be intensively mitigated to retain VRM II visual qualities, which would improve the recreational experience.

The wild horse management program would have impacts similar to those under Alternative 1. The size and health of the herd would affect the wild horse viewing experience.

Wildlife management actions would affect recreation management through increased restrictions (e.g., NSO requirements and timing restrictions) on surface disturbing activities in wildlife habitat. As a result, wildlife habitat would be improved under this alternative, thereby improving the overall recreation experience.

Summary

No significant impacts on recreation management would be likely to occur under this alternative. Upgraded VRM classifications would help protect the visual integrity in the long term. Improved forest, fire, minerals, livestock, water quality, and wild horse management would enhance wildlife viewing opportunities in the long term.

Closures to mineral leasing; prohibitions on surface occupancy; and withdrawals at recreation sites, historic sites, and habitat management areas would protect resources important to recreation.

The limitations to designated or existing roads for retrieval of big game kills and camping access would reduce road proliferation, soil disturbance, human encroachment, and motorized/nonmotorized conflicts, all of which would benefit recreation. OHV designations would improve recreation experiences by reducing excessive disturbance and habitat loss.

Preservation of the naturalness in the Adobe Town fringe areas and west Ferris Mountains would prevent degradation of these primitive recreation opportunities.

The increase in the number of SMAs would provide recreationists with more areas that are protected from development and provide benefits through enhanced management of special resources.

Changes in VRM designations would enhance mitigation of impacts on scenic resources in areas converted from VRM Class III to VRM Class II. The overall increase in VRM Class II designations in visually sensitive areas would help preserve the quality of recreational experiences in the RMPPA.

4.11.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on recreation resources from lands and realty, vegetation management, and wild horse management would be the same as those identified under Alternative 1.

Impacts on recreation from forest management would be similar to those identified under Alternative 1, except that 19,200 acres would be available for commercial timber harvest, as opposed to 25,900 acres. This would reduce displacement of forest recreationists and the decrease in recreational opportunities in forested areas.

Impacts from livestock management would be similar to those identified under Alternative 1. Conversions from livestock to domestic bison would not occur in areas of blocked federal surface land ownership, which would remove the potential risk to recreationists from bison.

Impacts resulting from minerals management would be similar to those under Alternative 1, except that 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 recreation values.

Off-road travel would be restricted to no more than 300 feet from designated or existing roads and vehicle routes for the purpose of game kill retrieval or access to primitive campsites. This would increase the difficulty of game retrieval and access to new potential campsites. Most heavily used campsites already have adequate vehicular access. In addition, reducing off-road travel opportunities and the potential for road/route/trail proliferation would do more to maintain the primitive naturalness appreciated by some recreationists.

Preservation of the naturalness in the west end of the Ferris Mountains (5,270 total acres) would provide outstanding opportunities for continued primitive and unconfined recreation.

Impacts resulting from SMAs would be similar to those under Alternative 1, except that the protections that would be afforded to SMAs would also benefit recreation, primarily because a greater area within the SMAs would be subject to restrictions on surface disturbing activity, increased withdrawals from mineral development, and active pursuits of land tenure adjustments. These actions would have long-term impacts as a result of enhanced recreational opportunities and a reduced probability of user conflicts.

Protections afforded to and improvements proposed for the JO Ranch would benefit recreationists, as would interpretive programs that would be developed for the area.

Actions that would enhance wildlife and fisheries habitat would benefit related recreational activities. Also, protections to the visual setting would serve to maintain the recreational experience.

The Encampment River Wild and Scenic River designation would protect the river corridor in the event that Congress releases the WSA from wilderness consideration. The WSR designation would preserve the recreational experience along the river corridor.

Areas surrounding the Continental Divide National Scenic Trail, and several other recreation sites, would be classified as an area of high importance for pursuing legal access. This would provide greater access to recreational opportunities and benefit recreationists.

VRM Class II acreage would be reduced around the Seminoe and Pathfinder Reservoirs and eliminated in the Shirley Mountains and the area with checkerboard land ownership patterns. The lands exhibiting wilderness characteristics that are adjacent to the Adobe Town WSA would be VRM Class II, which would preserve the visual horizon from key observation points within the WSA but would not preclude properly mitigated development other than large linear facilities such as transportation routes. The area is almost entirely leased, so development is probable. Development would degrade naturalness in the area, but VRM Class II management would reduce the impacts related to development.

The lands exhibiting wilderness characteristics that lie adjacent to the Ferris Mountain WSA would be VRM Class II, which would preserve the visual horizon from key observation points within the WSA. However, this area is not leased except that for the very southern portion, so impacts related to development would be unlikely to occur in areas adjacent to the WSA.

Under this alternative, impacts resulting from wildlife and fisheries management would benefit recreation because wildlife and fisheries habitats would be protected and enhanced, thereby improving wildlife- and fisheries-based recreation opportunities.

Many SMAs are so designated on the basis of important wildlife and fisheries habitats. Therefore, management actions for SMAs would enhance wildlife and fisheries habitat and would benefit related recreational activities.

Summary

No significant impacts are likely to occur to recreation management under this alternative.

Monitoring road densities would help preserve the recreational experience for recreationists seeking natural settings and would limit the likelihood of motorized/nonmotorized user conflicts.

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 4-3 summarizes the primary data and sources used to estimate physical inputs for the IMPLAN model.

Table 4-3. 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 Off-Highway Vehicle 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.

Environmental Justice

Executive Order (EO) 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—

- EO 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 state 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 all ready 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 (see 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 populations 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, whose economies are more closely aligned with mineral production industries. These counties have experienced a steady decline in employment throughout much of the past decade because of declines in coal and trona production, as well as reductions in oil and gas development. However, recent trends 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 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
Preferred Alternative	$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 net present value of estimated mineral royalties and taxes by alternative. Royalties and taxes have been discounted using a real discount rate of 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 to the 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 with increased oil and gas production. 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 custom and culture on a localized basis. 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 caused demand for skilled workers to exceed 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, and 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 EO 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 (see 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 impacts on a localized basis 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 (see 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 (see 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 nonlocal. 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 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 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; thus, community services were built to handle larger populations. However, if population increases occurred 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 from 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 (see 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 (see 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: Preferred Alternative

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 the 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 very 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, and environmental justice impacts are not expected.

4.13 SPECIAL MANAGEMENT AREAS

SMAs 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 SMAs.

Significance Criteria

Impacts on SMAs would be considered significant if any of the following occurred:

- A level of development or activity occurred that is incompatible with the SMA 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 SMA 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 Interim Management Policy (IMP) allows for very little flexibility for management decisions. Hence, the impacts have minimal variation among the alternatives. The IMP for WSAs precludes most

surface disturbing and 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.

Management actions that enhance biological or environmental characteristics would improve the wilderness quality and suitability of the WSAs. All such actions would be required to meet nonimpairment criteria before approval to ensure their appropriateness in a WSA.

WSAs are managed as VRM Class I areas in accordance with BLM policy (Instruction Memorandum No. 2000-096). Visual impairments adjacent to WSAs might be allowed if they were in conformance with the appropriate VRM classification for their location. 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, even though they might affect the experience of visitors.

The closure of the Ferris Mountain WSA to all types of motorized vehicle use would maintain or enhance the wilderness qualities of the area by preventing associated surface disturbance and preserving a sense of solitude for WSA visitors.

4.13.1.2 Impacts Under Alternative 1: Continuation of Existing Management

In the short term, limited fire and fuels management actions would maintain wilderness characteristics; however, the accumulation of fuels over time, and the failure to reintroduce fire into fire-dependent ecosystems would alter the wilderness characteristics over the long term.

Insufficient acreage of vegetation treatments would allow invasion and proliferation of noxious and invasive weed species beyond current levels. Because noxious and invasive weeds are not part of the native vegetation, their proliferation would compromise the wilderness characteristics found in each WSA. Wildlife and fish habitat and water quality would potentially be compromised by noxious and invasive weed proliferation. Non-native noxious and invasive weeds, such as thistles and saltcedar, would potentially create physical barriers to foot traffic adjacent to waterways and along roads and vehicle routes in the Encampment River WSA. Because opportunities for unconfined and primitive recreation are essential characteristics for wilderness designation, this WSA would be adversely affected.

Summary

Noxious and invasive weeds would result in significant impairment of wilderness characteristics, especially in the Encampment River WSA. Fuels management under this alternative could alter the community structure of fire-dependent ecosystems.

4.13.1.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from fire and fuels management under this alternative would be the same as those under Alternative 1.

Vegetation management actions would control the proliferation of noxious and invasive weed species and 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 located adjacent to the Encampment River.

Summary

The level of vegetation treatments conducted under this alternative would decrease the potential for introduction and spread of invasive species within the WSAs.

4.13.1.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Increased use of wildland fire for resource benefit and vegetation treatments 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). Under this alternative, all WSAs would be closed to OHV use, which would allow the revegetation of two-track vehicle routes, reduction in erosion, and decrease in establishment or spread of weed species.

Vegetation management would control the proliferation of noxious and invasive weed species and 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 located adjacent to the Encampment River.

VRM Class II designation in the Adobe Town fringe areas (31,510 total acres) and the west end of the Ferris Mountains (5,270 total acres) would reduce the disturbance and disruptive activities affecting the recreation experience within the Adobe Town and Ferris Mountain WSAs.

Summary

Management actions proposed under Alternative 3 would afford the most protection of wilderness characteristics. The wilderness characteristics of the WSAs would be protected and enhanced by closing roads to OHV use, protecting the west end of the Ferris Mountains and Adobe Town fringe areas, and upgrading these areas to VRM Class II.

4.13.1.5 Impacts Under Alternative 4: Preferred Alternative

Impacts under this alternative would be similar to those under Alternative 1, except that the Prospect Mountain (1,150 acres), Encampment River Canyon (4,510 acres), and Bennett Mountains (5,960 acres) WSAs would be closed to OHV use, which would allow the revegetation of two-track vehicle routes, reduction in erosion, and decrease in establishment or spread of weed species. Vegetation and fuels treatments would decrease the probability of large wildland fires that indirectly result in proliferation of invasive species. In addition, vegetation treatments would reduce fragmentation of the vegetation community and improve wildlife population viability over the long term.

Summary

Vegetation, habitat productivity, and species diversity would be protected through OHV restrictions for Prospect Mountain (1,150 acres), Encampment River Canyon (4,510 acres), and Bennett Mountains (5,960 acres). Vegetation and fuels management under this alternative would potentially alter the community structure of fire-dependent ecosystems and the loss of native species.

4.13.2 Como Bluff ACEC/NNL

4.13.2.1 Impacts Common to All Alternatives

Protection of the NRHP-listed Como Bluff cultural resource site provides indirect protection to the unique paleontological resources associated with the ACEC/National Natural Landmark (NNL). Restricting surface disturbing activities within ¼ mile of the cultural property would lessen the potential for such activities to dislocate or damage paleontological resources that were not discovered before surface disturbance.

Surface disturbance associated with fire and fuels management, lands and realty management, livestock grazing management, minerals management, and transportation and access management within the ACEC/NNL has the potential to damage or dislocate paleontological resources that were not discovered before surface disturbance (i.e., unanticipated discovery). Destruction of these resources would result in a loss of scientific information and degradation of the relevant and important values for which this area was designated an ACEC. Impacts on paleontological resources identified in a discovery situation are often greater than impacts on resources that were previously identified (and thereby avoided or subjected to mitigation measures) because damage to the resources might occur before their recordation and evaluation. The standard assessment and recordation procedures conducted before initiation of surface disturbing activities would reduce the potential for adverse impacts and increase the database of known paleontological resources.

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.

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 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 affords.

4.13.2.2 Impacts Under Alternative 1: Continuation of Existing Management

Intensive management of surface disturbing activities within ¼ mile of the Morrison Formation exposures would ensure the preservation of the paleontological resources.

The majority of the land in the Como Bluff ACEC and NNL is private and there is no legal public access; thus, impacts from BLM management actions would be minimal. Surface disturbing activities resulting

from BLM management actions would have some impact on the area by damaging or dislocating paleontological resources through unanticipated discoveries. However, the relevant and important values of the ACEC would be protected through management actions associated with its designation as an ACEC and NNL. Significant impacts would not be expected to occur because the level of development and activity that would occur in the ACEC/NNL would be compatible with the objectives and management prescriptions for the area.

Summary

Significant impacts would not be expected to occur because the level of development and activity that would occur in the ACEC/NNL would be compatible with the objectives and management prescriptions for the area.

4.13.2.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts would be similar to those under Alternative 1, except that surface disturbing activities resulting from BLM management actions would have some impact on the area by damaging or dislocating paleontological resources through unanticipated discoveries. However, the potential for oil and gas exploration and development is low. The values of the NNL would be protected through management actions associated with its designation as an NNL.

Summary

Significant impacts would not be expected to occur, because the level of development and activity that would occur in the NNL would be compatible with the objectives and management prescriptions for the area.

4.13.2.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Protections to paleontological resources resulting from cultural resource management would increase under this alternative. Prohibiting surface disturbing activities within ¼ mile of historic properties where the setting contributes to the NRHP eligibility would indirectly protect paleontological resources within those areas. This would ensure the preservation of the scientific information associated with those resources.

Public lands in the area would be closed to locatable mineral development and the operation of public land laws, including sale. This would provide additional protection to paleontological resources by reducing impacts associated with surface disturbing activities. Acquisition of adjacent lands or easements to improve public access would be considered and evaluated. Although this would allow more effective management of the ACEC, 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.

Implementing NSO stipulations on new oil and gas leases would reduce the level of surface disturbance associated with oil and gas development. Surface disturbance occurring on existing leases would continue but would be intensively managed, further reducing potential impacts on paleontological resources. In addition, closing the ACEC/NNL to locatable mineral entry and mineral material disposals would contribute to the protection of paleontological resources associated with these surface disturbing activities.

Summary

Intensive restrictions on surface disturbing activities would increase the level of protection to the unique paleontological resources in the ACEC/NNL beyond that provided by the other alternatives. As a result, the relevant and important values of the ACEC would be protected and no significant impacts would be anticipated.

4.13.2.5 Impacts Under Alternative 4: Preferred Alternative

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.

Intensive management of surface disturbing activities within ¼ mile of the Morrison Formation exposures would ensure preservation of the paleontological resources. However, the potential for oil and gas exploration and development is low.

Summary

The Como Bluff ACEC designation would be terminated; however, the values for which it was designated an NNL 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 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. Significant impacts would not be expected to occur, because the level of development and activity in the NNL would be compatible with the objectives and management prescriptions for the area.

4.13.3 Sand Hills ACEC

4.13.3.1 Impacts Common to All Alternatives

Protection of cultural resource sites under the National Historic Preservation Act (NHPA) within the Sand Hills ACEC would provide indirect, localized protection to the unique vegetation complex and wildlife habitat associated with the ACEC. Restricting surface disturbing activities within ¼ mile of cultural properties (if the setting contributes to NRHP eligibility) would help protect 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.

OHV use of existing roads and vehicle routes within the ACEC would create disturbances to raptor and sage grouse nesting activities and could in some cases result in lek abandonment. Any proliferation of trails would decrease vegetation cover and increase erosion, leading to big game, raptor, and sage grouse habitat loss. However, OHV use would be limited to designated roads and vehicle routes, which would minimize impacts on vegetation and wildlife resources.

Management actions specifically designed to protect the unique vegetation community and wildlife habitat in the ACEC would help maintain the relevant and important values for which the area was designated an ACEC. Restricting and intensively managing oil and gas development, locatable mineral exploration and development, and other surface disturbing activities within the ACEC would reduce the potential to degrade vegetation cover and wildlife habitat.

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 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.

4.13.3.2 Impacts Under Alternative 1: Continuation of Existing Management

Surface disturbance associated with fire and fuels management, lands and realty management, livestock management, minerals management, and transportation and access management within the ACEC has the potential to affect the relevant and important values for which the ACEC was designated. Such activity 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 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 linear features and other permitted facilities. Traffic would increase, which would increase dust and noise. Increased dust would make vegetation less palatable to wildlife species, resulting in forage loss. Increased noise would possibly affect the ability of female grouse to locate leks, potentially reducing the reproductive viability of the species. 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. Intensive management within the area would minimize these impacts through mitigation measures and best management practices (Appendix 15). Intensive management would help reduce disturbance of the unique vegetation community and would benefit wildlife species by maintaining forage quality and quantity, increasing hiding cover, and reducing stress during critical time periods. A case-by-case examination of any proposed surface disturbing activity would be conducted to determine potential adverse effects and appropriate mitigation to minimize those effects.

Wildland fire suppression activities would be managed for AMR with emphasis on suppression. This would help protect the unique bitterbrush/big sagebrush vegetation community and wildlife habitat from damage caused by wildland fires.

Existing fencing within the ACEC that is designed to improve grazing management would restrict wildlife movement. Construction of new livestock fences to BLM standards within the ACEC would help reduce impacts from fencing by making fences easier for wildlife to negotiate. In addition, designing livestock grazing systems to improve or maintain desired range conditions would maintain vegetation cover and soil stability, thereby preventing loss of the unique vegetation community for which the ACEC was originally designated.

Impacts on the Sand Hills ACEC from recreation activities, OHV use on roads and vehicle routes, and over-the-snow vehicle use would include displacement of and increased stress on wildlife when these activities occurred in crucial habitat or during critical time periods. The use of OHVs in the gathering of shed antlers would cause deer and elk undue stress.

Management of the Sand Hills ACEC would protect the unique vegetation community, thereby maintaining the suitability of habitats for big game species within the existing 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 to 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 setting that contributes to the NRHP eligibility of the ranch.

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 soils necessary to sustain the unique vegetation in this ACEC.

Avoidance or intensive management of surface disturbing activities in sensitive wildlife habitats would provide additional protection to the unique values of the ACEC by reducing the potential for such activities to remove the bitterbrush/big sagebrush vegetation community and degrade wildlife habitat. Vegetation resources would be completely protected in active raptor nesting areas, where surface disturbing activities are prohibited.

Summary

Surface disturbing activities resulting from lands and realty management, minerals management, OHV use management, and recreation management would have moderate impacts on the area by removing and degrading portions of the unique bitterbrush/big sagebrush vegetation community. 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 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. However, significant impacts would not be expected to occur because the level of development and activity that would occur in the area would be compatible with the objectives and management prescriptions for the area.

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 an ACEC.

4.13.3.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on the Sand Hills area from fire and fuels management; OHV management; recreation management; transportation and access management; and water quality, watershed, and soils management would be the same as those identified under Alternative 1.

Impacts from lands and realty management, minerals management, and livestock grazing management actions would be similar to those under Alternative 1, except that the actions would not be seasonally restricted. There would be no timing and spacing restrictions on surface disturbing and disruptive activities in crucial winter range 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. Degradation of Critical habitats, increased wildlife stress, displacement of species, and lower reproductive success of wildlife could result in loss of the relevant and important values that qualify the Sand Hills as an ACEC.

Grazing systems and range improvements would be implemented to enhance livestock production. Management would emphasize grass-dominated communities, resulting in loss of hiding cover for mule deer and elk, as well as shrub habitats used by songbirds and small mammals.

Impacts from the management of the Sand Hills area under this alternative would be similar to those under Alternative 1; however, 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 operations 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 to remove vegetation cover and degrade wildlife habitat. 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 shrub cover to improve species composition and production of both shrubs and grasses. This would reduce hiding cover for mule deer and elk. Increased grass production would primarily benefit cattle and elk, whereas improved diversity of shrubs would benefit Columbian sharp-tailed grouse. As shrub canopy increases, following treatments, the area would provide nesting and brood rearing habitat for Greater sage-grouse.

Impacts on the Sand Hills area from wildlife management would be similar to those identified under Alternative 1, except that less restrictive management actions to protect wildlife habitat (see Table 2-10) would allow increased levels of surface disturbance within the area.

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), impacts from lands and realty management and minerals management would likely increase. These impacts could escalate to significant levels if development and other disruptive activities were incompatible with the objectives and management prescriptions for the area.

4.13.3.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Protections to historical, vegetation, and wildlife resources provided by cultural resource management would increase under this alternative. Prohibiting surface disturbing activities within ¼ mile of historic properties where the setting contributes to the NRHP eligibility would eliminate all surface disturbance–related impacts on the unique bitterbrush/big sagebrush vegetation community and associated wildlife habitat in these areas.

Impacts on the Sand Hills ACEC from fire and fuels management would be similar to those identified under Alternative 1, except that the magnitude of wildland fires would be limited to the smallest possible area. 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.

Impacts on the Sand Hills ACEC from livestock grazing management would be similar to those identified under Alternative 1, except that grazing systems and range improvements would be implemented to achieve DPC and enhance wildlife, watershed, and riparian values while reducing livestock conflicts with other resources. Improved range conditions would subsequently help maintain the unique vegetation community and associated wildlife habitat within the ACEC. In addition, no new fences would be authorized and existing fences would be modified to current BLM standards. This would protect big game movement where fences were modified.

Impacts on the Sand Hills ACEC from lands and realty and minerals management would be similar to those under Alternative 1. However, closing public lands to locatable mineral development, to new oil and gas leasing, and to locatable mineral entry would minimize surface disturbing and disruptive activities. Wildlife habitat loss and fragmentation would be minimized, resulting in enhanced vegetation and wildlife resources, thus maintaining the values of the ACEC.

Impacts on the Sand Hills ACEC from OHV use would be similar to those identified under Alternative 1, except that the area would be closed to over-the-snow vehicles. This would reduce human-induced stress to big game during critical (winter) time periods. In addition, seasonal closures to motor vehicle use would be implemented as necessary to protect big game habitat by reducing inappropriate OHV use during certain times of the year.

Impacts from the management of the Sand Hills ACEC would be the same as those under Alternative 1, except that the 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 originally defined areas. As a result of this expansion, the ACEC would increase from 7,960 acres to 12,700 acres. Management actions for the ACEC, especially those prohibiting surface disturbing activities, would minimize conflicts with other resources and enhance the natural and cultural values of the ACEC.

Protection of the Sand Hills ACEC would increase as a result of VRM actions. The area within 2 miles (or the visual horizon) of the historic JO Ranch and the 5-mile viewshed along the Rawlins-Baggs Freight Road would be designated as VRM Class II, which would influence the size, scope, or location of surface disturbing activities, resulting in less habitat loss. In some cases VRM Class II designation would result in the relocation of a facility. The scenic values of the ACEC would be protected by this VRM management action.

The protections afforded to the Sand Hills ACEC from water quality, watershed, and soils management would be similar to those under Alternative 1. However, prohibiting surface discharge of produced water from federal leases would further protect the ACEC from erosion and channel modification in response to changes in surface hydrology.

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 lek habitat, greater seasonal restrictions, and controls and prohibitions on surface disturbing activities) would benefit big game, raptor, and sage grouse habitat associated with the ACEC.

Summary

Actions related to lands and realty management, minerals management, OHV management, and recreation management would have minimal impacts because of additional restrictions applied to surface disturbing and disruptive activities. As a result, the relevant and important values of the ACEC would be maintained. Significant impacts would not be expected to occur because the level of development and activity that would occur in the ACEC would be compatible with the objectives and management prescriptions for the area.

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 maintain 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. These values extend into the JO Ranch expansion area; thus, by expanding the ACEC to include this area, BLM would be able to provide additional protection of the area's unique values.

4.13.3.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on the Sand Hills ACEC from cultural resource management; fire and fuels management; OHV use management; vegetation management; VRM; and water quality, watershed, and soils management would be the same as those identified under Alternative 3.

Impacts on the Sand Hills ACEC from lands and realty management, livestock grazing management, minerals management, and transportation and access management would be the same as those identified under Alternative 1.

Impacts from recreation management would be similar to those identified under Alternative 1, except that seasonal closures to motor vehicle use would reduce human-induced stress to big game wildlife during critical time periods. In addition, the development of an interpretive program for the JO Ranch area would benefit the area by creating awareness of and appreciation for the cultural, wildlife, vegetation, and scenic qualities of the area.

Impacts from the management of the Sand Hills ACEC would be similar to those identified under Alternative 1, except that 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 originally defined ACEC. This expansion would increase the size of the ACEC from 7,960 acres to 12,700 acres. Because management actions for the ACEC would minimize conflicts with other resources and enhance the natural and cultural values, the expansion would ensure that the unique values of the ACEC would be protected beyond the ACEC's existing boundaries in the JO Ranch expansion area.

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

Actions related to lands and realty management, minerals management, OHV management, and recreation management would have minor impacts because of intensive management restrictions applied to surface disturbing and disruptive activities. These values would be protected beyond the boundaries of the existing ACEC in the JO Ranch expansion area. Significant impacts would not be expected to occur because the level of development and activity that would occur in the ACEC would be compatible with the objectives and management prescriptions for the 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, 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. These values would be protected beyond the boundaries of the existing ACEC in the JO Ranch expansion area.

4.13.4 Jep Canyon ACEC

4.13.4.1 Impacts Common to All Alternatives

The Jep Canyon ACEC (13,810 acres) would be managed to emphasize protection of crucial winter range for elk and nesting raptors. Wildland fires would be managed for AMR, which would most often result in suppression. However, some areas would be allowed to burn, which would enhance vegetation diversity within crucial winter range and benefit big game species. There would be minimal impacts on unique vegetation areas and wildlife habitats.

Management objectives for this area would be designed to minimize conflicts with adjacent landowners and to enhance the natural resource values of the area. However, the current 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 land might carry over to adjacent BLM lands and reduce the quality of wildlife habitat and forage.

There would be minimal impacts from lands and realty, minerals development, and livestock grazing management. Competition for vegetation, water, and space between big game and livestock would occur in localized areas. In addition, the viewshed would be adversely affected and traffic would increase, which would increase dust and noise. Surface disturbance of any magnitude would increase the potential for introduction of invasive plant species, degrading crucial winter range habitat. Intensive management within the area, including species-specific buffers and seasonal or temporal stipulations, would minimize these impacts.

Vegetation management would enhance the health and diversity of plant communities through use of natural fire and management prescriptions, such as burning, chemical, mechanical, and biological treatments. This would increase the diversity of wildlife habitat and increase forage. Management of aspen stands for increased distribution and improved seral structure would provide additional habitat and forage for raptor and big game species.

Management actions related to water quality, watershed, and soils management would emphasize protection and improvement of vegetation resources, which would benefit wildlife species.

4.13.4.2 Impacts Under Alternative 1: Continuation of Existing Management

Surface disturbing activities associated with mineral and lands and realty development would have an impact on Jep Canyon ACEC under Alternative 1. Intensive management would limit impacts on wildlife and fish and their associated habitat. Management would include, but would not be limited to, species-specific buffers and seasonal or temporal timing stipulations. This would minimize impacts, such as habitat loss, degradation, and fragmentation and displacement of wildlife, from permitted facilities. In addition, increased human presence from oil and gas activity would increase traffic, dust, and noise. Surface disturbance would increase the potential for introduction of invasive plant species, degrading crucial winter range habitat. Intensive management and use of BMPs within the area would minimize these impacts, although they would not completely eliminate them.

Lack of special management actions for aspen communities could result in loss of critical raptor nesting habitat. Overall impacts on wildlife species would include habitat loss, degradation, and fragmentation and displacement of species.

Summary

Under Alternative 1, impacts on the Jep Canyon ACEC from other management actions would not be significant to the crucial elk winter range and the productivity of raptor nesting pairs. Therefore, the relevant and important values of the ACEC would be protected under this alternative.

4.13.4.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Under this alternative the number and type of wildlife protection stipulations in force during project development would be decreased compared with Alternative 1. Therefore, the potential for impacts on nesting raptors and big game species during certain times of the year would increase. Particular resources that would potentially be negatively affected include big game parturition areas, migration corridors, and transitional ranges.

OHV use and over-the-snow vehicle use would be allowed on all existing roads and vehicle routes, which would affect big game in crucial winter ranges and cause disturbance and stress to other wildlife during crucial time periods.

Impacts on the Jep Canyon area from minerals management would be similar to those identified under Alternative 1. However, plans of operation would be required only for locatable mineral exploration involving surface disturbance of 5 acres or more. This would potentially result in small-scale loss of habitat in discrete locations that would collectively affect the qualities of the area as a WHMA.

Summary

Reduction in restrictions under this alternative would decrease protection of aspen stands, crucial elk winter range, and productivity of raptor nesting pairs.

4.13.4.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Under Alternative 3, surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This would ensure protection of wildlife and their associated habitat, particularly during sensitive time periods.

Intensive management of existing oil and gas leases, including timing restrictions on disruptive activities in big game habitat, raptor nesting areas, and Greater sage-grouse strutting and nesting habitat, would minimize the potential for impacts. Impacts would include habitat loss, fragmentation, and degradation, as well as wildlife displacement.

Limits on OHV use and over-the-snow vehicles would reduce the potential for surface disturbance, which would help mitigate degradation of forage and wildlife habitat. Off-road vehicular travel for "necessary tasks" would not be allowed. OHV activity would be limited to designated roads and vehicle routes and closed to over-the-snow vehicles. These limitations would minimize displacement of wildlife and damage to forage and habitat, and limit disturbance or stress during crucial time periods.

Improvement of public access would be achieved through easements across private lands adjacent to the Jep Canyon WHMA. Cooperation with adjacent landowners would also improve public access, increasing recreational opportunities. However, increased human presence would increase stress and hunting pressures on some wildlife species.

Impacts from vegetation management would be the same as those under Alternative 1, except that surface disturbance in aspen communities would be restricted or prohibited. This would provide forage and cover for big game, as well as benefit raptor species, which nest in aspen.

Summary

Under this alternative, opportunities to improve public access would be pursued, which would increase related impacts. However, this alternative has more restrictive management of minerals activities and off-road 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, big game crucial winter ranges and raptor habitat would undergo the fewest impacts under this alternative.

4.13.4.5 Impacts Under Alternative 4: Preferred Alternative

Under this alternative impacts from minerals management would be reduced compared with Alternative 1 because of changes in restrictions on surface disturbing activities in big game crucial winter range (see Table 2-10). Plans of operation would be required only for locatable mineral exploration involving surface disturbance of 5 acres or more. This could result in small-scale loss of habitat in discrete locations that would collectively affect the qualities of the area as a WHMA. However, the likelihood of this outcome is low because the area has a low potential for development in the foreseeable future. In addition, oil and gas leasing and related surface disturbance would be intensively managed to meet the objectives of the habitat management area.

Impacts from OHV use would be the same as those under Alternative 3.

Improvement of public access would be achieved through easements across private lands adjacent to the Jep Canyon WHMA. Cooperation with adjacent landowners would also improve public access. Increased access would lead to increased human presence, which would increase stress and hunting pressures on some wildlife species.

Impacts from vegetation management would be similar to those under Alternative 1, except that the aspen stands would be managed to increase distribution and improve seral structure. This would enhance nesting raptor habitat by increasing the amount and health of existing aspen stands.

Surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This would ensure protection of wildlife and fish and their associated habitat and sensitive life cycles.

Summary

To preserve some important resource values under Alternative 4, some areas could limit or preclude OHV use. However, based on the anticipated amount of roads and vehicle routes that would remain available to OHV use within the RMPPA, these impacts would be negligible.

4.13.5 Shamrock Hills ACEC

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. However, 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.

Surface disturbance from management activities would increase the potential for introduction of invasive species, compromise the visual integrity of the area, increase human traffic, and increase dust and noise. Wildlife species within the Shamrock Hills ACEC/RCA would suffer displacement, as well as loss, degradation, and fragmentation of habitat. Intensive management of surface disturbing activities would maintain nesting raptor habitat, resulting in very few impacts.

Wildland fires would be managed for AMR, which would most often result in suppression. However, some areas would be allowed to burn, which would enhance vegetation diversity within crucial winter range and benefit big game species.

Reclamation of areas subjected to surface disturbing activities would aid in restoring healthy, functioning native plant communities. In addition, vegetation management prescriptions, including burning; plantings; seedings; and chemical, mechanical and grazing treatments, would enhance the health and diversity of plant communities. This would increase the diversity of wildlife habitat and forage. Management of aspen stands for increased distribution and improved seral structure would provide additional habitat and forage for raptor and big game species.

4.13.5.2 Impacts Under Alternative 1: Continuation of Existing Management

Shamrock Hills ACEC management actions 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 all wildlife species.

Impacts the Shamrock Hills ACEC from minerals management would include degradation and fragmentation of habitat, and displacement of wildlife species from permitted facilities. In addition, the viewshed would be adversely affected and traffic would increase, which would increase dust and noise. Surface disturbing activities associated with the construction of facilities, pipelines, and mineral development would reduce the visual integrity of the Shamrock Hills ACEC. Surface disturbance would increase the potential for the introduction of invasive plant species, degrading the wildlife habitat. However, intensive management within the area would minimize these impacts.

There would be some impacts on big game in crucial winter ranges from over-the-snow vehicles. These impacts would include increased disturbance of and stress to wildlife during crucial time periods.

Wildlife habitat management actions would maintain the natural environment of the ACEC by restricting surface disturbing activities that alter wildlife habitat and forage. Seasonal restrictions on surface disturbing activities benefit nesting raptors by reducing stress to the species during sensitive times (see Table 2-10).

Summary

Existing wildlife stipulations would help reduce impacts; however, surface disturbing activities could affect the productivity of raptor nesting pairs.

4.13.5.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on the Shamrock Hills area from minerals management and OHV management under this alternative would be the same as those identified under Alternative 1. However, plans of operation would be required only for surface disturbance of 5 acres or more. This could result in small-scale loss of habitat in discrete locations that would collectively affect the qualities of the area as a WHMA.

Seasonal restrictions on surface disturbing activities in wildlife and fish habitat during sensitive periods would be limited under this alternative. Seasonal wildlife restrictions for sage grouse and raptors would be reduced, which would increase the opportunity to disturb these species during the periods of the year when they are most vulnerable. Overall impacts on wildlife species would include the displacement of wildlife and the loss, degradation, and fragmentation of habitat.

Summary

Impacts on the Shamrock Hills area from other management actions would be greatest under this alternative. Fewer stipulations on surface disturbing activities would affect the productivity of wildlife.

4.13.5.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Under Alternative 3, surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This would ensure protection of wildlife and their associated habitat, particularly during sensitive time periods. Development of oil and gas activities would be implemented according to BMPs for big game crucial winter range, which would reduce impacts on these species. Intensive management, including timing restrictions on disruptive activities in big game habitat, raptor nesting areas, and Greater sage-grouse strutting and nesting habitat, would also reduce impacts on these values. The amount of mineral development would decrease under this alternative because of withdrawals from

locatable mineral entry and prohibitions on new oil and gas leasing; therefore, impacts on wildlife species and their habitat would be reduced.

Limits on OHV and over-the-snow vehicle use would reduce the potential for surface disturbance, which would potentially damage forage and habitat. Off-road vehicular travel for "necessary tasks" would not be allowed. In addition, OHV activity would be limited to designated roads and vehicle routes and closed to over-the-snow vehicles. These limitations would minimize displacement of wildlife and damage to forage and habitat, and limit disturbance or stress during crucial time periods.

Improvement of public access would be achieved through easements across private lands adjacent to the Shamrock Hills Area. Cooperation with adjacent landowners would also improve public access, resulting in increased recreational opportunities. Increased human presence would increase stress and hunting pressures on some wildlife species.

Summary

Under this alternative, opportunities to improve public access would be pursued, which would increase related impacts. However, this alternative has more restrictive management for minerals activities and off-road 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, big game crucial winter ranges and raptor habitat would undergo the fewest impacts under this alternative.

4.13.5.5 Impacts Under Alternative 4: Preferred Alternative

Under Alternative 4, 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). Wildlife habitat objectives would be considered for all surface disturbing and disruptive activities (see Table 2-10). Priority would be given to achieving DPC for wildlife habitat (Appendix 19 and Appendix 24). This would ensure protection of wildlife and their associated habitat, particularly during sensitive time periods.

Allowing over-the-snow vehicles and off-road vehicular travel for "necessary tasks" would have impacts on big game in crucial winter ranges. These impacts would include increases in disturbance of and stress to wildlife during crucial time periods. Timing restrictions and buffers on disruptive activities in raptor nesting and Greater sage-grouse strutting and nesting habitat would reduce impacts on wildlife species.

Summary

Impacts on the relevant and important values would not be significant under Alternative 4. The ACEC designation would be terminated because of the complexities of management associated with the checkerboard land ownership pattern in the area. Management measures for the raptor concentration area would afford sufficient protection to relevant and important values identified for this area.

4.13.6 Stratton Sagebrush Steppe Research Area

4.13.6.1 Impacts Common to All Alternatives

Protection of cultural resource sites under the NHPA within the Stratton Sagebrush Steppe Research Area would provide indirect, localized protection to the sagebrush steppe vegetation community located within the area. Restricting surface disturbing activities within ¼ mile of cultural properties (if the setting

contributes to NRHP eligibility) would help protect the ecology and hydrology associated with this vegetation community.

Surface disturbance associated with fire and fuels management, lands and realty management, and minerals management would directly remove portions of the sagebrush steppe vegetation community and degrade the effectiveness of hydrologic function. However, intensive management within the area would minimize these impacts through mitigation measures and BMPs (Appendix 15).

Closing the area to locatable mineral development and future land disposal actions would result in the elimination of future disturbance that would compromise the integrity of the research area.

Management actions that facilitate recreation activity and access 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, some localized vegetation removal and increased erosion could occur.

Vegetation treatments conducted within the Stratton Sagebrush Steppe Research Area could remove vegetation cover over the short term, depending on the type of treatment. Impacts would be expected to be minimal because vegetation treatments would be designed in consideration of research objectives for the area and to maintain the relevant and important values of the Stratton Sagebrush Steppe Research Area, where fire has historically played a role in maintaining the native plant communities.

4.13.6.2 Impacts Under Alternative 1: Continuation of Existing Management

The Stratton Sagebrush Steppe Research Area would be managed as an AMR suppression area, which would most often result in suppression of wildland fires because of the intermixed landownership within the area. Wildland fire and suppression activities in this area could compromise vegetation plots and damage infrastructure, such as snow fences or instrumentation used for studies.

Moderate impacts on the Stratton Sagebrush Steppe Research Area would occur from lands and realty management and minerals management. Impacts on research plots would include habitat loss and degradation, and wildlife displacement from linear features (e.g., power lines, roads, and pipelines) and other permitted facilities (e.g., wind turbines and well pads). However, specific placement of facilities would minimize these impacts by avoiding research plots when possible. New leases would include an NSO stipulation, requiring directional drilling to extract resources, resulting in decreased loss of research potential.

Livestock grazing within the Stratton Sagebrush Steppe Research Area would be managed for multiple use. This would result in impacts on existing or future long-term vegetation studies and could compromise research objectives by introducing unquantifiable disturbance from grazing. Livestock grazing management strategies would be determined by the allotment management plan (AMP) for the Middlewood Hill Allotment; research would only be able to study the effects of existing grazing management. This AMP would not allow flexibility in the design of livestock-related disturbances for research objectives.

Off-road vehicular travel for “necessary tasks” would be allowed within the Stratton Sagebrush Steppe Research Area. This would increase the potential to remove vegetative cover and diminish research opportunities. However, because the frequency of this activity is expected to be low, related impacts would be minimal.

Avoidance or intensive management of surface disturbing activities in sensitive wildlife habitats would provide additional protection to the relevant and important values of the Stratton Sagebrush Steppe Research Area by reducing the potential for such activities to remove the sagebrush steppe vegetation community and diminish research opportunities. Vegetation resources would be completely protected in active raptor nests areas, where surface disturbing activities are prohibited.

Summary

The research potential of the area could be compromised under Alternative 1. Impacts would be significant because grazing and vegetation treatment actions might not be compatible with the research objectives and management prescriptions for the area.

4.13.6.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on the Stratton Sagebrush Steppe Research Area from fire and fuels management, lands and realty management, livestock grazing management, and OHV use 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. This would allow an increased level of surface disturbance related to well pad, road, and pipeline construction. To help minimize impacts, operators would be required to submit a management plan that described how their activities would affect research objectives. Mitigation measures would be required, where necessary, to protect the research area. Specifically, placement of well pads and roads would avoid research plots and minimize impacts whenever possible.

Impacts on the Stratton Sagebrush Steppe Research Area from wildlife and fisheries management would be similar to those identified under Alternative 1, except that the less restrictive management actions to protect wildlife habitat under this alternative (e.g., elimination of buffer zones around lek habitat, weaker seasonal restrictions, and elimination of controls and prohibitions on surface disturbing activities in big game habitat) would allow increased levels of surface disturbance within the area.

Summary

Impacts under this alternative would be the same as those under Alternative 1.

4.13.6.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts on the Stratton Sagebrush Steppe ACEC from lands and realty management would be the same as those identified under Alternative 1.

Protections to vegetation resources afforded by cultural resource management would increase under this alternative. Prohibiting surface disturbing activities within ¼ mile of historic properties where the setting contributes to the NRHP eligibility would eliminate all surface disturbance–related impacts on the sagebrush steppe vegetation community in these areas.

Impacts on the Stratton Sagebrush Steppe ACEC from fire and fuels management would be similar to those identified under Alternative 1, except that fire suppression activities would be managed to meet the research objectives of the ACEC. This would lessen the impacts associated with suppression activities by minimizing surface disturbances and avoiding research plots.

Impacts on the Stratton Sagebrush Steppe ACEC from livestock grazing management would be similar to those identified under Alternative 1, except that grazing strategies would not be determined on the basis of the AMP for the Middlewood Hill Allotment, and only activities that support research objectives would be allowed. This would reduce related impacts and enhance the research potential of the area.

Impacts on the Stratton Sagebrush Steppe ACEC from minerals management would be similar to those identified under Alternative 1. However, intensively managing surface disturbance on existing leases to meet research objectives of the ACEC would allow the placement of well pads and roads so that they avoided research plots and infrastructure and thereby would minimize impacts.

Impacts on the Stratton Sagebrush Steppe ACEC from OHV use management would be similar to those identified under Alternative 1, except that off-road vehicular travel for "necessary tasks" would not be allowed. This would reduce the potential to remove vegetative cover and diminish research opportunities.

Impacts on the Stratton Sagebrush Steppe ACEC 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 the level of surface disturbance within the ACEC.

Summary

A lower level of surface disturbance from grazing and vegetation treatment actions under this alternative would reduce related impacts. Significant impacts would not be expected to occur because the level of development and activity that would occur in the area would be compatible with the objectives and management prescriptions for the area.

4.13.6.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on the Stratton Sagebrush Steppe ACEC from lands and realty management would be the same as those identified under Alternative 1.

Impacts on the Stratton Sagebrush Steppe ACEC from cultural resources management, fire and fuels management, minerals management, and OHV use management would be the same as those identified under Alternative 3.

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 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 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 the level of surface disturbance within the area.

Summary

A lower level of surface disturbance grazing and vegetation treatment actions under this alternative would reduce related impacts. Significant impacts would not be expected to occur because the types of disturbances from BLM-approved activities would be compatible with the research goals for the area.

4.13.7 Chain Lakes Habitat Management Area

4.13.7.1 Impacts Common to All Alternatives

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.

The area is known to contain historic mud pots, a rare geologic feature. Protection of cultural resource sites under the NHPA provides protection to the area from surface disturbing activities. This results in preservation of the unique alkaline desert wetland system, a crucial winter habitat for pronghorn antelope.

Public lands within the checkerboard or other intermixed landownership areas would be managed in association with the private and state lands therein. Wildland fires would be managed for AMR, which would most often result in suppression.

Impacts on the Chain Lakes Potential Wildlife Habitat Management Area from lands and realty management and transportation and access management would occur. Impacts resulting from construction of linear features (e.g., power lines, roads, and pipelines) and other permitted facilities (e.g., wind turbines) would include habitat loss and degradation and displacement of wildlife. In addition, continuous noise from compressor stations would reduce the reproductive success of female Greater sage-grouse and interfere with their ability to locate leks. Wildlife species within the Chain Lakes WHMA/ACEC would suffer habitat loss, degradation, fragmentation, and displacement. Mitigation measures would minimize impacts on wildlife species by creating buffer zones around Critical habitat and restricting surface disturbing activities during critical times. Intensive management of surface disturbing activities would maintain the unique alkaline desert wetland system, resulting in very few impacts.

Reclamation of surface disturbing activities would aid in restoring healthy, functioning native plant communities. In addition, vegetation management prescriptions, including burning, plantings, seedings, and chemical, mechanical and grazing treatments, would enhance the health and diversity of the unique alkaline desert wetland system. This would increase the diversity and quantity of wildlife habitat and forage. Management actions related to water quality, watershed, and soils management would emphasize the protection and improvement of the unique alkaline desert wetland system. Wildlife species, including pronghorn, would benefit through increased forage and habitat diversity.

4.13.7.2 Impacts Under Alternative 1: Continuation of Existing Management

The area would be managed as a wildlife habitat management area and for compatible multiple use. Surface disturbing activities that would alter habitat, reduce forage, and fragment habitat would be intensively managed to minimize impacts.

Livestock grazing strategies and range improvement projects would be developed in cooperation with the WGFD to meet habitat objectives. Grazing practices would promote conditions that are in conformance with Standards for Healthy Rangelands (BLM 1997). Existing livestock use would be permitted on a temporary, nonrenewable basis, which would minimize impacts on wildlife habitat by not reducing critical forage for wintering species. With these agreements and practices and the flexibility in livestock permitting, impacts from livestock grazing on pronghorn winter range and the Chain Lakes wetlands would be minimal.

Impacts on the Chain Lakes Wildlife Habitat Management Area from minerals management would occur. Surface disturbing activities would be avoided within 500 feet of the edge of wetlands in the Chain Lakes Area, and development would be limited near these unique desert alkaline wetlands. Construction of roads, well pads, and maintenance facilities near these wetlands would compact soil, disturb vegetation and wildlife, and increase erosion and sediment transport, which could thereby modify the hydrology needed to support these wetlands. Surface disturbance would increase the potential for the proliferation of invasive plant species, which would affect the alkaline desert lake ecosystem. In addition, continuous noise from compressor stations would reduce the reproductive success of female Greater sage-grouse and interfere with their ability to locate leks. If these surface disturbing activities were allowed, impacts would be mitigated by site placement, design, or conditions of approval. Intensive management would minimize impacts on big game species in crucial winter range, nesting raptors, and breeding Greater sage-grouse.

Impacts on big game in crucial winter ranges from over-the-snow vehicles and off-road vehicular travel for “necessary tasks” during the winter would contribute, to varying degrees, to indirect impacts on wildlife when they are most vulnerable.

Surface discharges of produced water would be allowed in the contributing watershed with an NPDES permit. The contributing watershed has low to moderate potential for oil and gas development; however, if it were to occur, produced water could add to the flow of the Chain Lakes wetland complex. This action could change the chemistry of the wetland and contribute to salt and sediment loading to this system. Additional water might improve vegetation in the short term, but could alter the balance of the system with natural precipitation patterns. Impacts on the wetlands from the discharge of produced water in the contributing watershed would be indirect and depending on the volume of water discharged, could be substantial.

Wildlife habitat management actions would maintain the natural resources within the area by implementing NSO and timing restrictions for surface disturbing activities.

Summary

Under this alternative, the area would be managed for multiple use activities, and natural resources would be maintained. Mineral development activities and associated infrastructure would potentially result in significant impacts on relevant and important values, including pronghorn habitat and forage and the unique alkaline wetland system.

4.13.7.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from livestock grazing management, water quality, watershed, and soils management, minerals exploration management, OHV management, and wildlife management actions would be the same as those under Alternative 1.

Impacts under this alternative would be similar to those under Alternative 1. However, there is a greater potential for minerals management actions to affect wildlife species because of reduced restrictions from wildlife management actions. The seasonal disturbance zone restriction around active raptor nests would be reduced on a species-specific basis under Alternative 2. This would incrementally increase disturbance to nesting raptors. Development would be allowed year round in crucial winter range for pronghorn, which would increase stress to and temporarily displace species.

Summary

The potential for impacts on wildlife habitat and the unique alkaline lake system would be increased over Alternative 1 because of the reduction in wildlife and surface disturbance stipulations. Alternative 2 would provide the least protection for the relevant and important values of the Chain Lakes Wildlife Habitat Management Area.

4.13.7.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts on the Chain Lakes ACEC from grazing management would be the same as those in Alternative 1, except that the area would be managed as a vacant allotment and would have a temporary, non-renewable permit for livestock grazing. Livestock grazing strategies would support the objectives for the ACEC and benefit other allotments where rest from grazing use is needed.

Minerals management actions would be more restricted under this alternative. Under this alternative, surface disturbing activities would not be allowed within 500 feet of the wetland complex, and surface discharges of produced water from oil and gas activities would be allowed only if they meet ACEC objectives. 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 the level of surface disturbance within the ACEC. Closing the area to new oil and gas leasing and locatable mineral entry would prevent the loss and degradation of wildlife habitats and maintain the conditions of the unique alkaline desert wetlands. Since the objectives of this area under the ACEC designation would be to protect the wetlands and wildlife present, it is unlikely that surface discharges would be allowed in the contributing watershed to these wetlands, unless it was shown to improve the health of these systems.

Off-road vehicular activity for “necessary tasks” would not be allowed under Alternative 3. This would minimize impacts associated with this activity, including habitat loss, loss of vegetation and forage, damage to sensitive riparian/wetland areas and harassment of wildlife species.

Enhanced wildlife stipulations, including NSO and seasonal timing restrictions required for surface disturbing and other disruptive activities, would minimize disturbance to nesting and wintering wildlife.

Summary

Under this alternative, the Chain Lakes Area would be designated as an ACEC. The ACEC designation would restrict and/or prohibit new mineral development within the area, allowing for increased protection of pronghorn winter habitat and unique alkaline desert wetlands. Therefore, Alternative 3 provides the greatest protection for the relevant and important values of the area.

4.13.7.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on the Chain Lakes WHMA from grazing management would be the same as those in Alternative 3. Livestock grazing strategies would support the objectives for the WHMA and benefit other allotments where rest from grazing use is needed.

Minerals management actions would be more restricted under this alternative. Under this alternative, surface disturbing activities would not be allowed within 500 feet of the wetland complex, and surface discharges of produced water from oil and gas activities would be allowed only if they meet ACEC objectives. 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 the level of surface disturbance within the ACEC. Closing the area to new oil and gas leasing and locatable mineral entry would prevent the loss and degradation of wildlife habitats and maintain the conditions of the unique alkaline desert wetlands. Because the objectives of this area under the ACEC designation would be to protect the wetlands and wildlife present, it is unlikely that surface discharges would be allowed in the contributing watershed to these wetlands, unless it was shown to improve the health of these systems.

In addition, AMR for wildland fire would be managed in association with the private and state lands within the WHMA. This would not result in significant impacts on the Chain Lakes WHMA.

Summary

Impacts would be similar to those in Alternative 1. Management of surface disturbing activities to minimize disturbance within the unique alkaline wetlands would reduce the potential for pronghorn habitat degradation. Stipulations designed to protect wildlife habitat would be adequate, but would not provide as much protection as under Alternative 3.

4.13.8 Laramie Peak Wildlife Habitat Management Area

4.13.8.1 Impacts Common to All Alternatives

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 intermixed 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.

Fire and fuels management actions would serve to maintain the existing wildlife habitat of the area by reducing fuel loading and controlling wildland fires.

In the immediate area of new water developments, livestock use would increase, reducing available forage for wildlife. Grazing practices would promote conditions that are in conformance with Standards for Healthy Rangelands (BLM 1997); therefore, livestock grazing would not cause wildlife habitat degradation. The prohibition of domestic sheep and goats within 9 miles of bighorn sheep habitat in the WHMA would reduce the potential for the spread of disease to bighorn sheep populations, thereby maintaining the overall health of the big horn sheep populations.

Impacts on Laramie Peak WHMA from mineral material sales, disposable minerals, and locatable minerals actions would include big game habitat loss and fragmentation and wildlife displacement.

Because the potential for oil and gas development is so low within the WHMA, impacts from these actions would be minimal.

Vegetation management would restore healthy, functioning native plant communities through reclamation of surface disturbing activities. In addition, vegetation management would enhance the health and diversity of plant communities through 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.

4.13.8.2 Impacts Under Alternative 1: Continuation of Existing Management

Surface disturbance associated with lands and realty management would impact wildlife species and associated habitat through habitat loss and degradation and displacement of wildlife species. These impacts would result from the construction of linear features (e.g., power lines, roads, and pipelines) and other permitted facilities (e.g., wind turbines). Mitigation measures would reduce impacts on big game species in crucial winter range.

OHV management actions and recreation management actions would result in impacts on wildlife species and sensitive habitat. Impacts that might occur include not only wildlife stress and displacement but also habitat loss and fragmentation. However, the natural terrain of the Laramie Peak WHMA limits most traffic; therefore, impacts would be minor.

The existing level of vegetation treatments would not be sufficient to meet wildlife habitat objectives in the existing Laramie Peak Bighorn Sheep Habitat Management Plan. The lack of weed treatments and the proliferation of cheatgrass would continue, resulting in loss of forage and the degradation of wildlife habitat.

Summary

Under this alternative, the area would be managed as a wildlife habitat management area and would restrict surface disturbing activities to protect habitat conditions. Because of the proliferation of cheatgrass in this region and the dominance of late seral condition plant communities, habitat and forage would be significantly affected.

4.13.8.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Land tenure adjustments would not be pursued under Alternative 2. This would result in a decreased opportunity to acquire lands that would provide improved habitat and forage under BLM management.

There would be a reduction in the number and type of wildlife protection stipulations during project development under this alternative. Therefore, the potential to increase impacts on wildlife species during certain times of the year would increase. Particular resources that potentially would be negatively impacted are big game parturition areas, migration corridors, and transitional ranges.

Increases in vegetation treatments would result in a mixture of early, mid, and late seral conditions that would achieve wildlife objectives. The increase in weed treatments—specifically, invasive weeds such as cheatgrass—would minimize proliferation into native plant communities and enhance the values of wildlife habitat.

Summary

Increased vegetation and weed treatments would maintain and/or enhance forage and habitat for wildlife and livestock. Not pursuing land tenure adjustments would reduce BLM's ability to effectively manage for wildlife objectives. 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

Acquisition of adjacent lands would increase the opportunity for BLM to improve the quality and quantity of wildlife habitat. However, increased public access achieved through acquisition of lands adjacent to the Laramie Peak ACEC would lead to an increase in recreational activity. Impacts from increased public access would have the potential to increase wildlife habitat disturbance through greater human presence.

OHV use for necessary tasks would be analyzed before authorization to ensure wildlife and associated habitats are not adversely affected. Restricting OHV use to designated roads and vehicle routes would minimize impacts on crucial wildlife habitat.

Increases in vegetation treatments would result in a mixture of early, mid, and late seral conditions that would achieve wildlife objectives. The increase in weed treatments with an emphasis on noxious and invasive weeds, such as cheatgrass, would minimize proliferation into native plant communities and enhance the values of wildlife habitat.

Wildlife management actions 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 best management practices 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). This priority would ensure that the wildlife and fish and their associated habitat and sensitive life cycles are protected.

Summary

Under this alternative, 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 conserved through management actions of other resource programs.

4.13.8.5 Impacts Under Alternative 4: Preferred Alternative

The Laramie Peak area would be managed as a wildlife habitat management area. Management objectives would restore, improve, and enhance habitat conditions for big game species.

Acquisition of adjacent lands would increase the opportunity to acquire lands under BLM management to improve the quality and quantity of wildlife habitat. However, increased public access achieved through acquisition of lands adjacent to Laramie Peak Area would lead to an increase in recreational activity. Impacts from this would have the potential to increase wildlife habitat disturbance through greater human presence.

OHV use for "necessary tasks" would be analyzed before authorization to ensure wildlife and associated habitats are not adversely affected. Restrictions on OHV use to designated roads and vehicle routes would minimize impacts on crucial wildlife habitat.

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 improve wildlife habitat.

Surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This 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 allowance of multiple-use. Vegetation treatments designed to achieve DPC, restrictions on surface disturbing activities, and restrictions on off-road 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 Wildlife Management Area

4.13.9.1 Impacts Common to All Alternatives

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.

Fire and fuels management actions would serve to protect the big game wildlife habitat of the area by reducing fuel loading and controlling wildland fires. Wildland fire would be managed for AMR, which would most often result in suppression. There would be minimal impacts on unique values of the area.

Surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This would ensure that the wildlife and fish and their associated habitat and sensitive time periods are protected.

Reclamation of surface disturbing activities would aid in restoring healthy, functioning native plant communities. In addition, vegetation management prescriptions, including burning, plantings, seedings and chemical, mechanical, and biological treatments would enhance the health and diversity of antelope crucial winter range and maintain the scenic values of the red sandstone uplift. These actions would provide a mosaic of diverse wildlife habitat types and age classes of vegetation.

Management actions related to water quality, watershed, and soils management would emphasize the protection and improvement of vegetation resources.

4.13.9.2 Impacts Under Alternative 1: Continuation of Existing Management

Surface disturbing activities in Red Rim-Daley WHMA associated with lands and realty and minerals management actions would increase disturbance and human presence, resulting in localized habitat loss and degradation and in short-term wildlife displacement. These impacts would occur from construction of linear features (e.g., power lines, roads, and pipelines) and other permitted facilities. Mitigation measures would reduce disturbance to wildlife species in crucial winter range, nesting raptors, and breeding Greater sage-grouse.

Off-road vehicle traffic allowed for "necessary tasks" would potentially disturb pronghorn crucial winter range. Impacts that would occur to wildlife species and associated habitat include habitat loss and degradation and displacement of wildlife species.

Wildlife habitat management actions would enhance pronghorn habitat in the Red Rim-Daley WHMA. Management actions would emphasize protection and/or enhancement of habitat through restrictions on surface disturbing activities and limitations on seasonal use. Timing and distance restrictions for nesting raptors and grouse species would decrease impacts on pronghorn crucial winter range through restrictions on surface disturbing activities.

Summary

Under this alternative, the WHMA would be managed for multiple use activities, with emphasis on pronghorn crucial winter range. Surface disturbing activities would result in localized habitat loss and degradation and in short-term wildlife displacement. However, seasonal restrictions on surface disturbing activities would help reduce these impacts.

4.13.9.3 Impacts Under Alternative 2: Emphasis on Development of Resources

The potential for impacts on wildlife species would be increased over Alternative 1 because of the reduction in wildlife stipulations.

Impacts from OHV use would be the same as those mentioned in Alternative 1.

Impacts from lands and realty management and minerals management actions would be similar to those in Alternative 1, except that some oil and gas activity would be allowed during crucial winter periods, increasing stress to wintering pronghorn and other wildlife. The disturbance zone timing stipulation would be reduced for active raptor nests, which would potentially increase disturbance to nesting raptors and pronghorn habitat.

Increase in vegetation treatments would promote a mixture of early, mid, and late seral conditions that would achieve wildlife objectives by resulting in a healthier mosaic of forage species.

Summary

Vegetation management actions would promote diverse, healthy forage. Surface disturbing activities would not be mitigated to the extent in Alternative 1, resulting in a potential loss of wildlife forage and habitat. A reduction in the timing stipulations would increase human induced stress to wildlife species, potentially resulting in displacement.

4.13.9.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Improved public access would be achieved through acquisition of lands adjacent to Red Rim-Daley ACEC and acquisition of easements across private lands adjacent to the ACEC. Acquisition of private lands and easements across private lands would allow for contiguous habitat management; however, it would increase human presence, which would introduce stress to wintering wildlife.

Minerals management actions would have increased restrictions under this alternative. Closing the area to new oil and gas leasing and locatable mineral entry would prevent the loss and fragmentation of wildlife habitats. Under Alternative 3, 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). This would ensure that the wildlife and fish and their associated habitat and sensitive time periods are protected. Surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices designed to reduce the amount of human presence and activity during the winter months (Appendix 15). Timing restrictions on disruptive activities in big game habitat, raptor nesting areas, and Greater sage-grouse strutting and nesting habitat would also reduce impacts on these values.

OHV use for necessary tasks would be analyzed before authorization to ensure wildlife and associated habitats are not adversely affected. Restricting OHV use to designated roads and vehicle routes would minimize impacts on crucial wildlife habitat.

A VRM Class II designation would benefit the Red Rim-Daley ACEC by restricting the placement of facilities so that they would not compromise the visual integrity of the ACEC.

Summary

Management objectives for the ACEC would be designed to minimize conflicts with adjacent landowners and enhance the natural resource values of the area. Increased restrictions on surface disturbing activities would reduce the loss of habitat and forage and stress to wildlife species. Pursuing land acquisitions would potentially result in contiguous management of wildlife habitat.

4.13.9.5 Impacts Under Alternative 4: Preferred Alternative

Intensive management of locatable minerals disturbance would restrict access seasonally across the area. Under this alternative, there would be an NSO stipulation in areas with raptor nests and Greater sage-grouse leks, which would protect the unique wildlife values identified for the potential ACEC.

Off-road vehicular travel for “necessary tasks” would be analyzed before authorization to ensure wildlife and associated habitats are not adversely affected. Restricting OHV use to designated roads and vehicle routes would minimize impacts on crucial wildlife habitat.

Vegetation management actions to achieve DPC would enhance pronghorn winter range under this alternative by creating a mosaic of communities with herbaceous and woody species.

Summary

Under this alternative, the Red Rim-Daley Area would be managed as a wildlife habitat management area and for compatible multiple use. Restrictions on surface disturbing activities would reduce the loss of wildlife forage and habitat and stress to wildlife species during critical periods. Increased vegetation management actions would enhance wildlife habitat.

4.13.10 Pennock Mountain Wildlife Habitat Management Area

4.13.10.1 Impacts Common to All Alternatives

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 intermixed 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.

Fire and fuels management activities would contribute to the productivity and availability of big game habitat. Wildland fire would be managed for AMR, which would most often result in suppression. There would be minimal impacts on the unique values of the area.

Vegetation management would restore healthy, functioning native plant communities through reclamation of surface disturbing activities. Vegetation management also would enhance the health and diversity of plant communities through the use of natural fire and management prescriptions, such as burning, plantings, and seedings, and chemical, mechanical, biological, and grazing treatments. Vegetation treatments would have short-term impacts on Pennock Mountain Wildlife Habitat Management Area depending on the type and success of the treatment. Prescribed burns or other vegetation treatments would be designed to maintain the crucial wildlife habitat and improve the nutritional value of the forage. This would increase forage and the diversity of wildlife habitat.

Surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This priority would ensure that the wildlife and their associated habitat and sensitive time periods are protected.

Seasonal restrictions for lands and realty management actions and minerals management actions would minimize the impacts on wildlife during specific times of year. However, the human disturbance associated with construction activities would create stress to the wildlife, causing displacement of the species. The potential for mineral exploration and development is low.

Acquisition of adjacent lands ensures that these lands would be managed in accordance with BLM policy for protection of elk and mule deer crucial winter habitat. Currently, the Pennock Mountain Area is closed to human presence from November 15 to April 30. This restriction would reduce the potential for stress to elk and mule deer populations from human presence.

4.13.10.2 Impacts Under Alternative 1: Continuation of Existing Management

The area would be open to locatable mineral entry and mineral materials disposal. These activities would result in habitat loss, wildlife harassment, and potential displacement of animals, especially during sensitive time periods. However, implementation of seasonal restrictions, buffers, and timing stipulations would minimize impacts on wildlife and associated habitat.

The prohibition on livestock grazing within the management area would reduce competition between wildlife and livestock for forage. This would remove the use of livestock as a method of manipulating vegetation communities.

Off-road motor vehicle travel would only be allowed for "necessary tasks" between May 1 and November 14. This would result in minor impacts, such as habitat loss and fragmentation, as well as wildlife stress during this time of the year.

Improved public access achieved through acquisition of lands adjacent to Pennock Mountain WHMA and easements through private lands would lead to higher recreational visitation. Impacts from this would have the potential to increase wildlife habitat disturbance through greater human presence during the summer months. However, land tenure agreements would result in improved BLM management of wildlife habitat.

Summary

Seasonal restrictions on surface disturbing activities and prohibiting livestock grazing would reduce stress on wildlife species during critical times. Increased public access through land acquisitions would increase human induced stress. BLM's ability to effectively manage for wildlife habitat would be increased through land acquisitions.

4.13.10.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on Pennock Mountain WHMA from livestock grazing and OHV management would be the same as those described in Alternative 1.

There would be a reduction in the number of protective measures for wildlife species under this alternative. This reduction would potentially result in increased stress to wildlife species during the summer months. Additional impacts would include loss, degradation or fragmentation of habitat, and displacement of wildlife species from areas disturbed by authorized activities such as linear features and other permitted facilities. However, because of the low potential for mineral development this impact would be minimal.

Summary

Seasonal restrictions would be less restrictive. However, mineral development is unlikely to occur; therefore, associated disturbances to wildlife and their habitats would be minimal.

4.13.10.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The Pennock Mountain WHMA would be managed as a vacant allotment for livestock use. Grazing use would be licensed on a temporary, non-renewable basis to maintain the vegetation values and support wildlife use within the unit. The use in the unit would allow deferment or rest of other allotments in the RMPPA to promote improved wildlife habitat and/or allow recovery following wildfires and vegetation treatments. Livestock management actions (i.e., water improvements) would be designed to maintain and enhance overall habitat. This would be accomplished through strategic placement, which would promote dispersion of livestock throughout the area.

Closing the area to locatable mineral entry and mineral material sales, 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.

This alternative would provide the most protection to raptor nests, big game parturition areas, and Greater sage-grouse leks through NSO stipulations, as well as timing and seasonal restrictions. The unique wildlife values identified for the WHMA would be protected through restrictions. Development of oil

and gas activities would be implemented according to BMPs for big game crucial winter range, which would reduce impacts on elk and mule deer populations. Seasonal restrictions on disruptive activities in big game habitat, raptor nesting, and Greater sage-grouse strutting and nesting habitat would also reduce stress induced by human presence. In addition, activity would not be permitted at night within one-quarter mile of Greater sage-grouse leks, which would reduce disturbance to breeding grouse.

Summary

Impacts would not be significant. The WHMA and associated crucial winter habitat for elk and mule deer would be afforded the greatest level of protection through restrictions on surface disturbing activities, reduced human presence during critical times, and using livestock as a management tool for wildlife objectives.

4.13.10.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from OHV management and the management of the Pennock Mountain WHMA would be the same as those under Alternative 1.

Livestock grazing on the Pennock Mountain WHMA would be the same as those described in Alternative 3.

Timing stipulations on surface disturbing activities would reduce impacts on raptors, big game habitat and parturition areas, and Greater sage-grouse leks and nesting habitat, compared with Alternative 1. Management measures under the WHMA would afford sufficient protection of values for big game and raptor species.

Intensive management of minerals related surface disturbance would restrict access seasonally across the area. Seasonal restrictions on disruptive activities in big game habitat, raptor nesting, and Greater sage-grouse strutting and nesting habitat, as well as prohibition of human presence at night would also reduce stress to wildlife species. Surface disturbing or disruptive activities within big game crucial winter range would require the use of best management practices 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). This would ensure that wildlife species and their associated habitat would be protected during sensitive periods of their life cycle.

Summary

The WHMA would provide for multiple use and would afford protection for crucial winter habitat for elk and mule deer. Management actions from wildlife, vegetation, and livestock management would maintain and enhance Critical habitat and forage. Wildlife habitat objectives would be considered for all surface disturbing activities.

4.13.11 Wick-Beumee Wildlife Habitat Management Area

4.13.11.1 Impacts Common to All Alternatives

Under the MOU between BLM and the WGFD, the 280-acre parcel of BLM land associated with the Wick-Beumee WHMA reserves the grazing use for elk and other wildlife. In addition, the area is closed to human presence and motorized vehicle use, including over-the-snow vehicles, from November 16

through May 31. The impacts from these two stipulations would have a beneficial impacts on wildlife for which the Management Unit was established.

4.13.11.2 Impacts Under Alternative 1: Continuation of Existing Management

There would be no significant impacts on the continued operation of the unit by the WGFD for the purposes intended under this alternative from any BLM program management decision or activity.

Summary

Under this alternative, there would be no significant impacts on the continued ability of the unit to serve it intended purpose from any BLM program activity.

4.13.11.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts under this alternative would be the same as those under Alternative 1 for all resources.

Summary

Impacts under this alternative would be the same as those under Alternative 1 for all resources.

4.13.11.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Additional protections added to this area as a result of closure to locatable mineral entry, pursuit of withdrawals, closure to operation of the public land laws, closure to mineral material sales, closure to oil and gas leasing with intensive management of existing leases, active acquisition of adjacent parcels, and avoidance of surface disturbing activities in aspen communities would enhance the ability of this parcel to positively contribute to the objectives of the Wick-Beumee WHMA.

Summary

Impacts under this alternative would be similar to those under Alternative 1, except that additional protections would be provided to this isolated parcel.

4.13.11.5 Impacts Under Alternative 4: Preferred Alternative

Acquisition of neighboring parcels, pursuit of withdrawals, and closure to operation of the public land laws would increase the ability of this parcel to contribute to the effectiveness of the Wick-Beumee WHMA. All other impacts under this alternative would be similar to those described under Alternative 1.

Summary

Impacts under this alternative would be similar to those under Alternative 1, except that additional protections would be afforded to this isolated parcel.

4.13.12 Shirley Mountain SRMA

4.13.12.1 Impacts Common to All Alternatives

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 intermingled 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.

AMR would most often result in fire suppression. There would be minimal impacts on unique values of the area. Fire and fuels management actions would serve to protect the big game wildlife habitat.

Because the potential for development is low, impacts from minerals management actions to the area would be minimal.

4.13.12.2 Impacts Under Alternative 1: Continuation of Existing Management

Under Alternative 1, the Shirley Mountain Caves SRMA (24,440 acres) (Map 2-14) would be managed to provide for protection and enjoyment of the cave system, whereas other resource uses would be allowed aboveground. There would be no additional management actions for the protection for bat species under this alternative. The lack of special management for bat species would result in loss of habitat, displacement, and disturbance to bat species that depend on the cave complex.

Human visitation to the cave during critical time periods could impact the cave ecosystem, and the bat species dependent on associated climatic conditions. Uncontrolled human presence within the cave changes temperatures and humidity levels outside species requirements, which would impact the breeding success rates and increases bat mortality during hibernation. The seasonal closure of the Cave Creek Cave to human occupancy from November 1 through March 31 would reduce human impacts on the cave system. However, potential easement acquisition would increase human visitation to the cave resulting in further degradation to the cave ecosystem.

Current forest management practices, such as restriction of timber harvest within 500 feet of riparian habitat and associated buffer zones, and mitigation requirements on steep slopes, would reduce disturbance and disruption of species, especially big game species, and would help to maintain the integrity of the habitat.

Summary

Alternative 1 would provide adequate protection to most wildlife resources in the area. However, because timber harvesting would be allowed in the watershed above the caves would alter the hydrology, the climatic and ecological conditions required for the bat species within the cave system would not protected.

4.13.12.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Under Alternative 2, the Shirley Mountain Caves SRMA, including the Cave Creek Cave, would not be maintained and the area would be managed as a multiple-use area. Management actions under this alternative would focus on Cave Creek Cave, and the protection of the cave complex and associated bat species. Overall, management actions proposed under this alternative would benefit these sensitive species.

Timber harvest would be intensively managed within ¼ mile of the cave to meet bat cave management objectives. Intensive management would provide protection to the cave ecosystem by maintaining climatic conditions that are essential for bat species.

Shirley Mountain would be downgraded from VRM Class II to VRM Class III. This would provide less protection of the visual qualities, which could potentially reduce the quality of the recreational experience in the area.

Summary

Intensive management of timber harvesting within one-quarter mile of the cave complex would help maintain the hydrology that creates the climatic and ecological conditions required for bat species to maintain a viable population within the cave system.

4.13.12.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Under Alternative 3, the Shirley Mountain Caves SRMA would not be maintained, and the area would be managed as an ACEC (520 acres). Management actions, including seasonal closures for cave use would focus on Cave Creek Cave, and the protection of the cave complex and associated bat species. These actions would benefit these sensitive species.

The unique characteristics of the cave complex would be enhanced through restrictions on timber harvesting within one-half mile of the bat cave complex. This action would benefit the sensitive bat species that require specific temperatures and humidity during breeding and hibernating periods.

Under this alternative, public lands would be closed to operation of public lands laws, including sale, and withdrawals would be pursued. These actions would benefit the unique cave complex by maintaining public ownership and federal management. Further, land acquisitions would provide greater control over management activities on adjacent lands.

Impacts on Shirley Mountain Bat Cave Potential ACEC from recreation management would have the same type of impacts as Alternative 1.

Summary

Not allowing timber harvesting within one-half mile of the cave complex would maintain the hydrology that creates the climatic and ecological conditions required for bat species to maintain a viable population within the cave system.

4.13.12.5 Impacts Under Alternative 4: Preferred Alternative

Under Alternative 4, the Shirley Mountain Caves SRMA would not be maintained, and the area would be managed as an ACEC (240 acres). The Shirley Mountain Bat Cave ACEC management would benefit the cave ecosystem by controlling human presence. Management actions would focus on Cave Creek Cave and the protection of the cave complex and associated bat species. These would include seasonal closure to human occupancy from October 15 through April 30, which would reduce human disturbance to both the cave system and bat species.

Timber harvest would not be allowed within one-quarter mile of the bat cave complex, providing protection to the cave ecosystem by maintaining the climatic conditions that are essential for bat species.

Withdrawals from land tenure adjustments, including sale, would be pursued. Land acquisitions would provide greater control over management activities, such as timber harvesting, on adjacent lands, which would ensure the climatic stability of the cave for breeding bats. Acquisition of lands would increase recreational visitation to the general area.

Summary

Not allowing timber harvesting within one-quarter mile of the cave complex would maintain the hydrology that creates the climatic and ecological conditions required for bat species to maintain a viable population within the cave system.

Increasing the seasonal closure under this alternative would afford additional protection of the bat species.

4.13.13 Laramie Plains Lakes Area

4.13.13.1 Impacts Common to All

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 intermixed 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.

There would be minimal impacts on unique values of the area as a result of fire management activities. Wildland fire would be managed for AMR, which would most often result in suppression.

Reclamation of surface disturbing activities would aid in restoring healthy, functioning native plant communities. In addition, vegetation management prescriptions, including burning, plantings, seedings and chemical, and mechanical and grazing treatments would be designed to enhance the health and diversity of the potential Wyoming toad habitat.

Management actions related to water quality, watershed, and soils management would emphasize the protection and improvement of potential Wyoming toad habitat.

Wyoming toad habitat objectives would be considered for all surface disturbing activities. Surface disturbing or disruptive activities would result in habitat loss, degradation, fragmentation, and displacement of potential Wyoming toad populations. Surface disturbance would increase the potential for introduction and proliferation of invasive plant species, potentially harming riparian vegetation critical for Wyoming toad populations.

4.13.13.2 Impacts Under Alternative 1: Continuation of Existing Management

Off-road vehicular travel for "necessary tasks" would be allowed throughout the area. Improved public access would be achieved through acquisition of adjacent lands to the Laramie Plains Lakes area. Additional or improved access would lead to a more recreational visitation. Impacts would include increased surface disturbance, soil and vegetation compaction, and an increase in two tracks.

The potential for impacts from lands and realty and minerals management actions would be low as a result of the low potential for development within the area. Impacts would include habitat loss, degradation and fragmentation, and displacement of potential Wyoming toad habitat from the construction of linear features (e.g., power lines and roads) and other permitted facilities. Surface disturbance areas would increase the potential for proliferation of invasive plant species, potentially changing the vegetation component required for Wyoming toad populations. Intensive management would be required to ensure that this would not occur. As potential Wyoming toad habitat is within avoidance areas for surface disturbing activities the potential for impacts is low.

Summary

Pursuit of public land acquisitions could increase the potential for expansion of Wyoming toad habitat. However, increased access associated with acquisitions could increase impacts from surface disturbing and disruptive activities.

4.13.13.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from minerals, lands and realty, and OHV management would be the same as those under Alternative 1.

Acquisition of additional public lands would not be pursued, which would limit the opportunity to expand potential Wyoming toad habitat. Conversely, the potential for recreational visitation would decrease as compared to Alternative 1, thereby reducing probable disturbance to potential Wyoming toad habitat.

Summary

Public land acquisitions would not be pursued within the Laramie Plains Lakes Area, potentially limiting management opportunities for the benefit of Wyoming toad habitat.

4.13.13.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Acquisition of lands would be pursued to expand potential Wyoming toad habitat. In addition, public lands within the ACEC would not be disposed of, thereby protecting potential Wyoming toad habitat. This would improve the overall quality and quantity of habitat.

Closure of the ACEC to operation of the public land laws, locatable minerals, new oil and gas leasing, and common variety mineral disposals would further reduce potential loss of Wyoming toad habitat. Restrictions on surface disturbing activities, including seasonal restrictions, species-specific buffers, practicing BMPs, and intensive management, would minimize impacts. Intensive management of all authorized actions within the ACEC would ensure that potential Wyoming toad habitat is not destroyed.

Prohibiting all forms of OHV travel would maintain potential Wyoming toad habitat through reductions in potential surface disturbance.

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 for Wyoming toad habitat.

Summary

Closure of the ACEC to operation of the public land laws, locatable minerals, new oil and gas leasing, and common variety mineral disposals would further reduce potential loss of Wyoming toad habitat by reducing the probability of surface disturbance. Additional or improved access to the area would likely increase soil compaction and surface disturbance in the area, resulting in a greater loss of potential Wyoming toad habitat. Management for DPC would maintain or enhance Wyoming toad habitat.

4.13.13.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from OHV and minerals management would be the same as those under Alternative 1.

Acquisition of lands would increase the opportunity to expand BLM jurisdiction in potential Wyoming toad habitat. Closure of the WHMA to land tenure adjustments and not allowing disposals of public lands would keep potential Wyoming toad habitat under BLM jurisdiction. This would benefit the species by ensuring surface disturbing activities do not degrade or fragment potential habitat. The improved access that would result from land acquisitions would lead to more recreational visitation. Impacts would include increased surface disturbance, soil and vegetation compaction, and an increase in two track roads.

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 for Wyoming toad habitat.

Summary

Impacts would be similar to Alternative 1. However, limiting off-road vehicular use for necessary tasks and mineral entry activity would also help to maintain habitat for the endangered Wyoming toad.

4.13.14 Historic Trails (Cherokee, Overland, Rawlins to Baggs, and Rawlins to Fort Washakie)

4.13.14.1 Impacts Common to All Alternatives

Management actions would be designed to minimize conflicts with adjacent landowners and enhance the historic resource values of the area to meet management objectives. However, the checkerboard land ownership reduces BLM's ability to effectively manage for cultural values. Surface disturbing activities located on private lands are not subject to the same restrictions and stipulations for preservation of historic values. These actions might have impacts that carry over to the adjacent BLM lands and reduce the potential for properties to be listed on the National Register.

Surface disturbance associated with fire and fuels management, lands and realty management, livestock grazing management, and minerals management that occurs within the viewsheds of the historic trails would create visual intrusions and degrade the visual integrity and historic values of the trails. However, in accordance with the Wyoming Mitigation Guidelines for Surface Disturbing and Disruptive Activities (Appendix 1), areas within one-quarter mile of historic trails where the setting contributes to the NRHP eligibility would be avoidance areas for all surface disturbing activities. Development would be allowed with intensive mitigation on a case-by-case basis. Implementation of these measures would reduce the level of visual intrusion to the trails' viewsheds, which would help protect the values for which they are eligible to the NRHP.

Consideration of the contributing setting in conjunction with compliance with laws and regulations would help to mitigate development-related impacts within the setting, ensuring that significant effects do not occur (Appendix 5). The ability to manage the setting of the historic trails would be limited in the checkerboard landownership areas because federally stipulated mitigation measures would apply to only those actions on federally administered lands or on undertakings with federal involvement (Appendix 5). Impacts would likely occur on adjacent parcels where BLM has no management responsibilities.

Wildland fire suppression activities (e.g., construction of fire lines, bulldozing access roads, and general movement of heavy equipment) would create surface disturbances and resultant visual intrusions to the trails' viewsheds. On large fires, cultural resource specialists would be present to ensure that suppression activities do not adversely affect known historic properties. To ensure protection of cultural properties, cultural resource specialists occasionally inventory fire lines and access roads before suppression activities.

Impacts on the historic trails from OHV use would be minimal. 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 OHV use.

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.

General vegetation management actions designed to protect and maintain vegetation resources within the viewshed of historic trails would indirectly help maintain the physical integrity of the historic trails. Implementing the Standards for Healthy Rangelands (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.

VRM actions would provide protections to the viewsheds of historic trails. Segments of the historic trails that are located within VRM class I and II areas would benefit from preclusion or intensive mitigation of surface disturbing activities and associated visual impacts. In addition, management actions that require structures to blend into the landscape on portions of the historic trails where the setting contributes to NRHP eligibility would further protect the visual integrity of the historic trails (Appendix 5).

4.13.14.2 Impacts Under Alternative 1: Continuation of Existing Management

The Overland Trail and the Cherokee Trail area would be managed for the preservation of historic values.

Wildland fire suppression activities would be managed for AMR, which would consider protection of natural and cultural resources. This would likely limit the degree and location of suppression activities and thereby reduce the potential for such activities to create visual intrusions and degrade the visual integrity and historic values of the trails.

Management actions associated with lands and realty management, livestock grazing management, and leasable, locatable, and common variety minerals management that result in development projects within the trails' setting that contributes to NRHP eligibility would be mitigated. The area within one-quarter mile (or the visual horizon) of the trails would be an avoidance area for surface disturbing activities. This would reduce surface disturbance in proximity to the trails and minimize related visual intrusions. Consequently, there would be no direct impacts on the trails where the setting contributes to NRHP eligibility.

Designing livestock grazing systems to improve or maintain desired range conditions would serve to maintain vegetation cover and soil stability, which would help to protect the physical integrity of the historic trails.

Avoidance or intensive management of surface disturbing activities in sensitive wildlife habitats would provide indirect protection to segments of the historic trails located in these areas by reducing surface disturbance and related visual intrusions. The historic trails and their viewsheds would be completely protected in active raptor nesting areas where surface disturbing activities are prohibited.

Summary

Surface disturbing activities would create visual intrusions to the viewsheds of the trails and degrade the visual integrity and historic values of the trails. However, these impacts would be mitigated by cultural resources management actions and implementation of federal regulatory laws, actions, and guidelines designed to protect cultural resources. Restricting activities that would adversely affect contributing trail segments or requiring mitigation measures would ensure that the physical integrity of these segments would be preserved. Consequently, direct impacts on the historic trails where the setting contributes to NRHP eligibility would not occur. This would protect the trails from activities that might compromise the values for which they are eligible to the NRHP. Significant impacts would not be expected to occur because the level of development and activity that would occur in the area would be compatible with the objectives and management prescriptions for the area.

4.13.14.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from locatable and common variety minerals management will be the same as under Alternative 1.

Impacts on the historic trails from fire and fuels management would be similar to those identified in Alternative 1, except that emphasis would be placed on the suppression of all wildland fires. This would increase suppression activities and related surface disturbance and increase the level of visual intrusions to the historic trails.

Impacts on the historic trails from lands and realty management, livestock grazing management, and leasable minerals management would be similar to those identified in Alternative 1. However, a greater number of development projects are anticipated throughout the RMPPA because of fewer restrictions being placed on other resource programs. Compliance with laws and regulations would mitigate adverse effects to the visual integrity of the setting (Appendix 5). Collective, adverse effects would result from allowing multiple developments with less restrictive mitigation. Individually, these might not compromise the values for which the trails are eligible; however, when several developments are permitted with less restrictive mitigation, the historic trails setting could be compromised to the point that it is no longer contributing to the overall eligibility.

Impacts on the historic trails from vegetation management would increase under this alternative. Conducting a greater number of vegetation treatments would increase short-term losses of vegetative cover but would benefit the historic trails through increased soil stability over the long term.

Fewer VRM Class II designations, especially in the checkerboard landownership areas, would increase potential impacts on the historic trails. Surface disturbing activities would be allowed over a larger area with fewer restrictions, potentially resulting in increased visual intrusions to the viewshed of the historic trails.

Impacts on the historic trails from wildlife and fisheries management would be similar to those identified in Alternative 1, except that less restrictive management actions to protect wildlife habitat (e.g., elimination of buffer zones around lek habitat, weaker seasonal restrictions, and elimination of controls and prohibitions on surface disturbing activities in big game habitat) would allow for increased levels of surface disturbance within the viewshed of the historic trails.

Summary

Impacts under this alternative would be similar to those identified in Alternative 1. However, an increase in the number of proposed mineral developments, fewer restrictions on surface disturbing activities from other resource programs, and a decrease in VRM class II designations in the checkerboard area would potentially result in collective, adverse effects to the values for which the trails are eligible. Consequently, the setting of the historic trails would be compromised to the point that it is no longer contributing to the overall eligibility, thereby resulting in significant impacts.

4.13.14.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Protections to the historic trails that result from cultural resource management would increase under this alternative. Prohibiting surface disturbing activities within one-quarter mile of historic properties where the setting contributes to the NRHP eligibility would eliminate all surface disturbance-related impacts within these areas.

Impacts on the historic trails from fire and fuels management would be similar to those identified in Alternative 1, except that a decrease in wildland fire suppression activities would decrease the level of visual intrusions to the viewsheds of the historic trails. Although the potential for degradation of the trails' viewsheds would decrease, impacts from post-fire rehabilitation activities would increase. In addition, the extreme heat associated with the increased intensity of wildland fires would increase the potential for damage to historic artifacts associated with the trails.

Impacts on the historic trails from lands and realty management, livestock grazing management, and minerals management would be similar to those identified in Alternative 1, except that increased restrictions on surface disturbing activities would greatly reduce potential impacts. Prohibitions on surface disturbing activities within the Historic Trails ACEC, implementation of NSO stipulations on new oil and gas leases, pursuance of withdrawals, and closures to mineral material disposals and locatable mineral entry would protect the physical integrity of the trails and any associated sites or segments from adverse physical impacts.

The area within 5 miles of the historic trails where the setting contributes to the NRHP eligibility would be designated as VRM Class II. Developments associated with lands and realty management, livestock grazing management, and leasable minerals management 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 characteristic landscape (Appendix 25). This would increase the protections to the visual integrity of the historic trails within these areas. However, as the majority of the historic trails in the RMPPA occur in the alternating checkerboard land ownership area, this management action would only effectively protect the setting of the historic trails if there were federal involvement in the proposed undertaking (Appendix 5).

Those areas of the Historic Trails ACEC that overlap with the proposed Sand Hills ACEC and the Upper Muddy Creek Watershed/Grizzly Area would benefit from the additional restrictions to surface disturbing activities in those areas. Additional restrictions would provide increased protection to the physical trace and the setting of the historic trails.

Managing soils and vegetation for DPC, would reduce the potential for impacts on the physical integrity of the historic trails by enhancing specific plant communities, which would improve soil stability. These actions would encourage preservation of the historic trails in their current condition.

Impacts from wildlife and fish management actions on cultural resources would be similar to those impacts identified in Alternative 1, except that restrictions on surface disturbances would increase in sensitive wildlife habitat areas. A greater number of areas would be avoidance areas for surface disturbing activities under this alternative. This would result in fewer potential impacts on the setting that contributes to the historic trails' NRHP eligibility. Additional restrictions within big game crucial winter range and within 2 miles of Greater sage and sharp-tailed grouse leks would protect the visual setting of the historic trails in those areas.

Summary

Actions under this alternative would provide the most protection to the physical and visual integrity of the historic trails. The VRM Class II designation within 5 miles (or the visual horizon) of the historic trails would preclude or further restrict a greater number of developments over a larger area. The setting of the historic trails that contributes to NRHP eligibility would benefit because management actions would require developments to blend into the landscape, thus not producing an adverse effect to the setting of the historic trails (Appendix 5 and 25).

Prohibiting all surface disturbing activities within the ACEC and closing the area to locatable mineral entry and common variety minerals disposals would protect the physical and visual integrity of the historic trails and any associated sites or segments, thereby maintaining the relevant and important values for which the area was designated an ACEC. Significant impacts would not be expected to occur because the level of development and activity that would occur in the ACEC would be compatible with the objectives and management prescriptions for the area.

4.13.14.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on the historic trails from cultural resources management would be the same as those identified in Alternative 3.

Impacts on the historic trails from fire and fuels management would be the same as those identified in Alternative 1.

Impacts on the historic trails from lands and realty management, livestock grazing management, and minerals management would be similar to those identified in Alternative 1, except that greater restrictions on surface disturbing activities would provide further protection to the visual and physical integrity of the trails. The area within one-quarter mile (or the visual horizon) of the historic trails where the setting contributes to the NRHP eligibility would be open to oil and gas leasing with an NSO stipulation, closed to locatable mineral entry, and closed to mineral material disposals. This would reduce the level of surface disturbance in proximity to the trails and ensure the protection of the physical and visual integrity of the trails.

The area within 2 miles of the historic trails where the setting contributes to the NRHP eligibility would be designated as VRM Class II. 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 characteristic landscape (Appendix 25). This would ensure the protection of the integrity of setting of the historic trails within these areas. Although these management actions would only apply to those actions on federally administered lands or on undertakings with federal involvement, this action would effectively protect the majority of the setting of the historic trails within the checkerboard landownership area.

Vegetation treatments would be increased throughout the RMPPA under this alternative. This would not only increase short-term losses of vegetative cover, but also benefit the historic trails through increased

soil stability over the long term. Managing soils and vegetation for DPC would reduce the potential for impacts on the physical integrity of the historic trails by enhancing specific plant communities, which would improve soil stability. These actions would encourage preservation of the historic trails in their current condition.

Impacts on the historic trails from wildlife and fisheries management would be similar to those identified in 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 increase indirect protections to the historic trails by reducing surface disturbance.

Summary

Impacts on the historic trails would be similar to those identified in Alternative 1. Most impacts on the historic trails would continue to be mitigated by cultural resources management actions and implementation of federal regulatory laws, actions, and guidelines designed to protect cultural resources (Appendix 5). However, increased restrictions on surface disturbing activities under this alternative would likely reduce impacts compared with Alternative 1. The designation of VRM Class II within 2 miles of the historic trails would ensure that federally involved management actions would be mitigated so as to not compromise the visual integrity of the trails. Prohibiting all surface disturbing activities within one-quarter mile of the trails where the setting contributes to the NRHP eligibility and closing the area to locatable mineral entry and common variety minerals disposals would protect both the physical and visual integrity of the historic trails. Significant impacts would not be expected to occur because the level of development and activity that would occur in the area would be compatible with the objectives and management prescriptions for the area.

4.13.15 Blowout Penstemon Area

4.13.15.1 Impacts Common to All Alternatives

Protection of cultural resource sites under the NHPA within the Blowout Penstemon Area would provide indirect, localized protection to blowout penstemon potential habitat. Restricting surface disturbing activities within one-quarter 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.

Increased use of wildland fire for resource benefit and vegetation treatments would allow wildland fire to play its natural ecological role (subject to suppression needs), thereby improving vegetative and soil conditions, including the areas where blowout penstemon occurs.

Surface disturbance associated with livestock grazing would reduce competition from competing plants and promote potential expansion of blowout penstemon populations. Conversely, grazing of the blowout penstemon plant during extended periods of drought or during the reproductive period of the plant would potentially reduce the viability of the population.

Blowout penstemon is federally listed as an endangered plant and receives protection under the ESA. Therefore, direct disturbance to blowout penstemon from any activities on BLM-administered lands would not occur. Locations where blowout penstemon has been identified would be avoidance areas for all surface disturbing activities on federal lands. Surface disturbing activities would be intensively managed in these areas. However, surface disturbing activities would be allowed in blowout penstemon potential habitat, which would indirectly affect the future expansion of the population.

Surface disturbance associated with lands and realty management, livestock grazing management, and minerals management that occurs within the Blowout Penstemon Area has the potential to disturb and degrade blowout penstemon potential habitat. This could in turn reduce species recruitment and the amount of area available for expansion of the population.

OHV use within the Blowout Penstemon Area would increase the potential for invasive weed proliferation, which could result in increased competition for nutrients, water, and space between weed species and blowout penstemon. This would degrade blowout penstemon potential habitat areas and increase the potential for loss of individual plants.

Vegetation management actions would maintain or enhance the habitat of the blowout penstemon, ensuring future success of the plant.

4.13.15.2 Impacts Under Alternative 1: Continuation of Existing Management

The Blowout Penstemon Area would be managed with emphasis of management for the plant, which would protect blowout penstemon habitat and the research potential of the species.

Wildland fire suppression activities would be managed for AMR, which would include consideration of natural and cultural resources. This would help limit impacts on blowout penstemon potential habitat by considering this species when determining the degree and location of suppression activities.

Land tenure adjustments (acquisitions, easements, and exchanges) would reduce the potential for surface disturbing activities to degrade blowout penstemon habitat or remove individual plants on non-federal inholdings. Increasing the amount of blowout penstemon habitat under federal jurisdiction would ensure that the species receives protection from federal agencies.

Allowing off-road vehicular travel for “necessary tasks” would increase the potential to degrade blowout penstemon potential habitat and inadvertently damage or remove individual plants. However, because the frequency of this activity is expected to be low, related impacts would be minimal.

Summary

Surface disturbing activities that occur in blowout penstemon potential habitat would indirectly affect the future expansion of the population. Land tenure adjustments would be pursued to reduce the effects of surface disturbance associated with nonfederal inholdings and thereby protect additional blowout penstemon habitat areas. Intensive management of surface disturbing activities would prevent direct impacts on blowout penstemon on BLM-administered lands. Significant impacts would not be expected to occur because the level of development and activity that would occur in the area would be compatible with the objectives and management prescriptions for the area.

4.13.15.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts on the Blowout Penstemon Area would be the same as those identified in Alternative 1 for all resource programs, except that land tenure adjustments would not be pursued. The absence of land tenure adjustments (acquisitions, easements, and exchanges) would not limit surface disturbance associated with nonfederal inholdings, as would be the case under Alternative 1. Consequently, blowout penstemon habitat would not be afforded additional protection under federal ownership. Significant impacts would not be expected to occur because the level of development and activity that would occur in the area would be compatible with the objectives and management prescriptions for the area.

Summary

Impacts under this alternative would be similar to Alternative 1, except that land tenure adjustments would not be pursued, potentially limiting management opportunities for the benefit of blowout penstemon habitat.

4.13.15.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts on the Blowout Penstemon ACEC from lands and realty management would be the same as those identified in Alternative 1.

Managing fire suppression activities for early succession of plant communities would ensure that the natural processes of the sand dune complexes continue to create viable habitat for the blowout penstemon.

Closing the area to locatable mineral entry and mineral material disposals would reduce surface disturbance within the ACEC. This action would protect the existing plant community and protect potential habitat. Prohibitions on surface disturbing activities within blowout penstemon potential habitat would enable the species to proliferate, possibly to the extent that it would no longer require protection under ESA.

Impacts on the Blowout Penstemon ACEC from OHV use management would be similar to those identified in Alternative 1, except off-road vehicular travel for "necessary tasks" would not be allowed. This would reduce the potential to degrade blowout penstemon potential habitat and inadvertently damage or remove individual plants.

Designating the area as an ACEC would help to maintain and enhance blowout penstemon habitat and research potential by providing additional protection to potential habitat within the sand dune complexes. It would allow research goals to be fulfilled, ensure the viability and expansion of the species, and possibly result in delisting the species from the ESA.

Summary

Impacts under this alternative would be similar to Alternative 1, except that designating the area as an ACEC would promote additional protection for blowout penstemon habitat through restrictions on surface disturbing and disruptive activities. Although surface disturbing and disruptive activities would still affect the future expansion of the population, the relevant and important values of the ACEC would be protected.

4.13.15.5 Impacts Under Alternative 4: Preferred Alternative

Impacts would be the same as those identified in Alternative 3.

4.13.16 Upper Muddy Creek Watershed/Grizzly Area

4.13.16.1 Impacts Common to All Alternatives

Impacts from transportation and access and the associated road network would include accelerated erosion throughout the area. This would impact native fish habitat by increasing sediment delivery to the streams. This would also impact riparian function and reduce the availability of hard substrate (gravels, cobbles) required by many native fishes. Upland habitat would also be degraded because of increased erosion.

The area would be open to locatable mineral entry and mineral material disposal. Given the presence of a very unique native fish fauna, reintroduction area for CRCT and high ecological diversity of the area, surface disturbing activities (e.g., road construction) would impact the conservation of sensitive fish and wildlife species in the RMPPA by increasing sedimentation rates and altering local hydrological conditions.

Vegetation management would enhance the health and diversity of plant communities through the use of natural fire and management prescriptions, such as burning, plantings, seedings, and chemical, mechanical, biological, and grazing treatments. This would increase forage and the diversity of wildlife habitat.

Wildlife and fish species would benefit from improved vegetative conditions resulting from water quality, watershed, and soils management actions.

Surface disturbing and disruptive activities within big game crucial winter range would require the use of best management practices designed to reduce the amount of human presence and activity during the winter months (Appendix 15). This would prevent loss of habitat, forage and cover during sensitive life cycles. Wildlife habitat objectives would be considered for all surface disturbing activities.

4.13.16.2 Impacts Under Alternative 1: Continuation of Existing Management

Implementation of management actions associated with reintroduction 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 the entire fauna of native warm water and coldwater fishes known to occupy adjacent habitats within the upper Muddy Creek watershed.

Impacts on wildlife and associated habitat within the Upper Muddy Creek Watershed /Grizzly area from lands and realty management would include loss and degradation of habitat and temporary displacement of wildlife during construction of linear features (e.g., power lines, roads, and pipelines) and other permitted facilities.

Given the presence of a very unique native fish fauna, reintroduction area for CRCT, and high ecological diversity of the area, livestock use in riparian areas within this area would impact fish habitats and negatively affect the conservation of sensitive wildlife and fish species in this area. Livestock grazing of riparian vegetation in this area would slow progress toward the desired future stream conditions in fish habitats exhibiting high sedimentation rates, diminished woody vegetation density, altered physical and chemical water quality parameters, and altered stream geometry.

Intensive management of aspen communities would improve elk habitat and provide habitat, forage, and cover for other wildlife species. However, the lack of weed treatments and the proliferation of weed species would continue, resulting in the degradation of watersheds and wildlife habitat.

Because the potential for oil and gas development is high, there is a corresponding potential for surface disturbing and disruptive activities. Intensive management would reduce the potential for loss of crucial habitats. 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. However, these restrictions would not adequately protect important values of the area.

Off-road vehicular travel would be permitted for "necessary tasks." This activity would result in surface disturbance that would alter vegetation composition, increase erosion, and alter the riparian function and quality of important aquatic and big game habitat.

Surface disturbing activities would not be permitted within 500 feet of Muddy and Littlefield Creeks and other ephemeral and perennial streams. Management of streams to improve their PFC rating would result in improved fish habitat conditions. However, these actions alone might not provide all the required habitat elements because the management of riparian areas to achieve PFC would not take into consideration the habitat requirements of native fishes.

Impacts resulting from the construction of impoundments, in stream structures, and road crossings would be minimized where possible. However, impacts associated with fragmentation and alteration of fish habitats would remain.

Summary

Management would not emphasize habitats to proactively address the conservation of BLM sensitive species. Therefore, there would be significant impacts on the area.

4.13.16.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from OHV, water quality, watershed, and soils management and livestock grazing management would be the same as those identified in Alternative 1.

Lands and 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 the nesting period, which would increase disturbance to nesting raptors. Surface disturbance areas would increase the potential for proliferation of invasive plant species, degrading crucial winter range and native fish species habitat. Impacts on the habitat of native fishes would be the similar to those described in Alternative 1. However, the magnitude of those impacts would increase as a result of additional emphasis on the production of commodity resources under this alternative.

Increased vegetation treatments would result in a mixture of early, mid, and late seral conditions that would achieve the objectives of the fish and wildlife habitat management area. The increase in weed treatments, with an emphasis on all noxious and invasive weeds, would minimize proliferation into native plant communities and maintain the values of wildlife habitat.

Summary

Impacts under this alternative would be similar to those under Alternative 1, except that the potential for development activities would be greater; therefore, impacts would be significant and proportionally larger.

4.13.16.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from lands and realty management actions, surface disturbance in aspen communities, OHV use, and minerals management would be minimal 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.

Impacts on riparian habitats and associated aquatic species would be greatly reduced under this alternative by restricting development within one-quarter mile of all ephemeral or perennial stream channels. This would limit the amount of alteration to local hydrologic processes caused by road development and surface disturbing activities and act to maintain existing hydrologic conditions required to provide suitable habitat conditions for the unique native fish fauna present in this watershed.

Livestock grazing strategies designed to achieve DPC would maintain or enhance habitats required by wildlife and fish.

The ACEC would be closed to locatable mineral entry and mineral material disposals, thereby preventing 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. The number of surface locations for oil and gas drilling would be determined from BMPs for crucial winter ranges and Greater sage-grouse leks, which would reduce surface disturbance when compared with Alternative 1. Native fish habitat would be maintained and enhanced through decreased sediment loading in streams. Intensive management of surface disturbing activities would minimize impacts on wildlife by reducing disturbance to raptors, Greater sage-grouse, native fishes, wintering wildlife, and prairie dogs.

Restrictions on OHV use would be greater, resulting in reduced stress to big game species and minimizing soil erosion and sedimentation within 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 inappropriate OHV use during certain times of the year.

Under this alternative, 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 into adjacent habitats within 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.

An increase in vegetation treatments would result in a mixture of early, mid, and late seral conditions that would achieve the objectives of the fish and wildlife management area. The increase in weed treatments, with an emphasis on maintaining weed free areas, would minimize the proliferation into native plant communities and maintain the value of the wildlife habitat.

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. Injecting the water produced from the development of natural gas from coal reservoirs would eliminate potential alterations of the highly fluctuating environment in which the native fishes have evolved. Restriction of projects that (1) result in water depletions or (2) cause salt loading in the Colorado River Basin would similarly act to preserve local hydrologic processes required to maintain habitats of native fishes. Prohibiting surface disturbing activities in areas outside (1) identified 100-year flood plains, (2) areas within 500 feet of perennial waters, springs, wells, and wetland/riparian areas, and (3) areas 100 feet from the inner gorge of ephemeral channels would also act to enhance existing hydrologic conditions required to maintain suitable fish habitats.

Impacts under this alternative would be the same as those under Alternative 1, except 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. Management of fish habitats to achieve their potential natural condition would provide habitat suitable for native fishes.

Expanding reintroduction efforts for Colorado River cutthroat trout and other native cold and warm water fishes into adjacent habitats within the Upper Muddy Creek/Grizzly ACEC would act to preserve the native Colorado River Basin fish fauna in this isolated headwater system.

Impacts resulting from the construction of impoundments and instream structures would be avoided 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.

Summary

Under this alternative, ACEC objectives would emphasize enhancement of habitats required to support the unique native Colorado River Basin fish fauna, Greater sage-grouse, and wintering big game species. The relevant and important values of the area would be afforded the greatest amount of protection under Alternative 3.

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 the other alternatives.

4.13.16.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from lands and realty management and minerals management would be the same as those identified in Alternative 1.

Impacts from livestock management under this alternative would the same as Alternative 1, except that DPC in areas suitable for reintroduction of native fishes would emphasize the habitat requirements of these fishes.

Vegetation 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.

Impacts under this alternative would be similar to those under Alternative 1, except that waters produced from CBNG development activities in the Colorado River Basin would be injected, thus eliminating potential alterations of the highly fluctuating environment in which the native fishes have evolved.

Impacts under this alternative would be the same as those under Alternative 1, except 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.

4.13.17 White-Tailed Prairie Dog Area

4.13.17.1 Impacts Common to All Alternatives

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.

Avoidance of cultural resource sites under the NHPA, where they occur, would provide protection to the area from surface disturbing activities.

Surface disturbing activities associated with authorized actions would fragment and degrade white-tailed prairie dog habitat, specifically short grass, saltbush steppe, and low sagebrush-grass communities.

Management actions related to water quality, watershed, and soils management include emphasis on the protection and improvement of vegetation resources, which would maintain white-tailed prairie dog habitat.

4.13.17.2 Impacts Under Alternative 1: Continuation of Existing Management

The area would be open to locatable mineral entry and mineral material disposal. Existing prairie dog towns would be avoided during surface disturbing activities, which would ensure that the species would not suffer any significant loss of habitat.

Impacts on the White-Tailed Prairie Dog area from lands and realty management would occur from linear features and other permitted facilities. 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 the white-tailed prairie dog. Additional impacts would include habitat loss and temporary displacement of prairie dogs. Intensive management for other wildlife species would include buffers and seasonal restrictions. This would minimize disturbance during sensitive periods within the life cycle of white-tailed prairie dogs.

Summary

Under this alternative, activities permitted in the area would 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 white-tailed prairie dog populations and protect the area by relocating activities outside white-tailed prairie dog towns.

4.13.17.3 Impacts Under Alternative 2: Emphasis on Development of Resources

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.

Summary

The removal of protections would degrade white-tailed prairie dog habitat and increase predation and stress of white-tailed prairie dogs. Moderate impacts would occur to prairie dogs, a keystone species for many raptors, including burrowing owls.

4.13.17.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The ACEC would be closed to locatable mineral entry and mineral material disposal. As opportunity arises, land tenure adjustments, easements or exchanges would be pursued to meet the ACEC objectives. Closure of specific roads would be considered on a case-by-case basis to meet the objectives of the ACEC. These actions would improve the quantity and quality of white-tailed prairie dog habitat by reducing potential surface disturbing activities.

Management actions associated with wildlife management (i.e., intensive management of surface disturbing activities) would provide protection to white-tailed prairie dog towns and complexes. In addition, protection is afforded through restrictions in crucial winter range, nesting and breeding grouse habitat, grouse leks, and nesting raptor species. Restrictions on prairie dog poisoning by Animal and Plant Health Inspection Service (APHIS) would benefit the viability of the species.

Surface disturbing activities would not be allowed within a 150-foot avoidance zone around individual prairie dog towns, which would reduce prairie dog habitat disturbance. The number and placement of surface locations for oil and gas drilling would be influenced by BMPs for big game crucial winter ranges and seasonal restrictions for nesting and breeding grouse and raptors. Surface disturbance would be decreased, resulting in less white-tailed prairie dog habitat loss. No aboveground facilities would be allowed within one-quarter mile of prairie dog towns unless equipped with anti-raptor perching devices are installed, resulting in reduced raptor predation.

Summary

Surface disturbing and disruptive activities would be prohibited within white-tailed prairie dog towns or complexes. Intensive management would meet the needs of the white-tailed prairie dog populations and protect the area by relocating activities outside white-tailed prairie dog towns.

4.13.17.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from lands and realty and minerals management would be the same as those identified in Alternative 1.

Impacts from wildlife management actions would be the same as those identified in Alternative 3.

Summary

Alternative 4 would provide greater protection to white-tailed prairie dogs and their associated habitat than Alternative 1. Intensive management and continuation of existing management practices would meet the needs of the white-tailed prairie dog populations and still meet multiple-use objectives.

4.13.18 High Savery Dam

4.13.18.1 Impacts Common to All Alternatives

The area would be cooperatively managed for recreational objectives, multiple-use objectives and irrigation water, consistent with the June 2003 MOU between WWDC and BLM (see Appendix 23).

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 intermingled 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.

Under all alternatives, protection of cultural resource sites under the NHPA provides an additional layer of protection of the area from surface disturbing activities.

AMR would most often result in suppression, reducing impacts on unique values of the area from wildfire. Although construction of fire lines and general movement of heavy equipment would temporarily displace wildlife species within the area, fire and fuels management actions would protect the big game wildlife habitat over the long term through the reduction of fuel loading and control of wildland fires.

The High Savery Dam ACEC would be managed as a vacant allotment for livestock use. Grazing use would be licensed on a temporary, non-renewable basis to maintain the vegetation values and support wildlife use within the unit. The use in the unit would allow deferment or rest of other allotments in the RMPPA to promote improved wildlife habitat and/or allow recovery following wildfires and vegetation treatments. Livestock management actions (i.e., water improvements) would be designed to maintain and enhance overall habitat. This would be accomplished through strategic placement, which would promote dispersion of livestock throughout the area. These livestock grazing strategies would support the June 2003 MOU between WWDC and BLM.

OHV management actions would have a beneficial impact on the High Savery Dam by restricting vehicular access and associated surface disturbance in sensitive areas, such as riparian areas. Big game and grouse habitat would be protected through this action.

There are no current oil and gas or other mineral leases within the High Savery Dam Area. Any future leasing within the area would be restricted from surface disturbance; therefore, no impacts would result from leasable minerals actions.

The application of vegetation treatments would help conserve riparian habitat and increase the potential for fishery development. Such actions would increase recreational opportunities by enhancing wildlife and fish habitat.

Lands would be managed in coordination with WWDC to protect water quality and watershed health. This would minimize impacts and benefit these resource values.

4.13.18.2 Impacts Under Alternative 1: Continuation of Existing Management

The area would be open to the operation of public land laws, including sale, where consistent with the intent and purpose of the MOU.

Surface disturbance could result from locatable mineral entry and disposal of common variety minerals; however, the potential for locatable and common variety minerals is low. Mitigation would be required to reduce sediment loading to the reservoir. Reclamation activities and proper placement of facilities would minimize erosion. Long-term impacts on the area from minerals activities would be minimal.

Summary

Under this alternative, management actions from lands and realty and minerals management would result in minimal surface disturbance to the area.

4.13.18.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts under this alternative would be the same as those identified in Alternative 1.

Summary

Impacts under this alternative would be the same as Alternative 1.

4.13.18.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The area would be intensively managed to protect and enhance the riparian habitat of High Savery Dam ACEC. This area would also be managed to achieve DPC, which would result in improved vegetation conditions to benefit all resource values.

Closing the area to future land disposal actions would result in the elimination of future disturbance that would compromise the integrity of the ACEC. The area would be managed cooperatively in accordance with BLM standards ensuring enhancement of the resource. There would be no impacts from lands and realty management under this alternative because the area would be withdrawn from operation of public land laws, which would further reduce the potential for surface disturbing and disruptive activities. These actions would collectively enhance wildlife habitat and quality of the recreation experience.

The High Savery Dam Area would be closed to locatable mineral entry and mineral material disposals, which would prevent associated surface disturbance. Decreased potential for surface disturbance would indirectly preserve the relevant and important values of the area, and maintain the quality of recreational experiences and wildlife habitat.

Summary

Under Alternative 3, management actions from resource programs would enhance the relevant and important values of the High Savery Dam and Reservoir ACEC. This alternative would provide additional protection to riparian habitat, result in attainment of DPC, and eliminate lands and realty and minerals management actions.

4.13.18.5 Impacts Under Alternative 4: Preferred Alternative

The area would be open to the operation of public land laws, including sale, where consistent with the intent and purpose of the MOU.

This area would be managed to achieve DPC, which would result in improved vegetation conditions to benefit all resource values.

Surface disturbance could result from locatable mineral entry and disposal of common variety minerals; however, the potential for locatable and common variety minerals is low. Decreased potential for surface disturbance would indirectly maintain the quality of recreational experiences and wildlife habitat.

Summary

Impacts under this alternative would be the same as Alternative 3.

4.13.19 Continental Divide National Scenic Trail SRMA

4.13.19.1 Impacts Common to All Alternatives

Developments would be allowed along the trail, showcasing multiple use on BLM lands. Some recreation opportunities might be limited but not precluded. Range improvements provide water sources where no others exist along portions of the trail. Where the trail passes through the checkerboard land pattern, it follows state highways and BLM roads because they provide the only legal public access through these areas.

4.13.19.2 Impacts Under Alternative 1: Continuation of Existing Management

Based on the objectives for the SRMA, which encourage multiple use of lands adjacent to the trail, resource program management actions would not impact the Continental Divide National Scenic Trail SRMA under this alternative.

4.13.19.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Based on the objectives for the SRMA, which encourage multiple-use of lands adjacent to the trail, resource program management actions would not impact the Continental Divide National Scenic Trail SRMA under this alternative.

Summary

Impacts under this alternative would be the same as Alternative 1.

4.13.19.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Based on the objectives for the SRMA, which encourage multiple use of lands adjacent to the trail, resource program management actions would not impact the Continental Divide National Scenic Trail SRMA under this alternative. Public lands that are 30 feet either side of the centerline along the trail would be closed to locatable mineral entry and land tenure adjustments. These actions would limit industrial development that would potentially reduce the quality of the recreational experience of some users of the trail.

Summary

Impacts under this alternative would be similar to Alternative 1, except public lands (30 feet either side of the centerline) along the trail would be closed to locatable mineral entry and land tenure adjustments. These actions would limit industrial development that would potentially reduce the quality of the recreational experience of some users of the trail.

4.13.19.5 Impacts Under Alternative 4: Preferred Alternative

Based on the objectives for the SRMA, which encourage multiple use of lands adjacent to the trail, resource program management actions would not impact the Continental Divide National Scenic Trail SRMA. The public lands (30 feet either side of the centerline) along the trail would be closed to locatable mineral entry and land tenure adjustments. These actions would limit industrial development that would potentially reduce the quality of the recreational experience of some users of the trail.

Summary

Impacts under this alternative would be the same as Alternative 3.

4.13.20 North Platte River SRMA

4.13.20.1 Impacts Common to All Alternatives

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 intermixed land ownership reduces BLM's ability to effectively manage for recreational opportunities and wildlife and fish 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 fish and wildlife habitat and forage.

Protection of cultural resource sites under the NHPA, where they occur, provides protection to the area from surface disturbing activities.

Wildland fire would be managed for AMR, which would result in suppression. There would be minimal impacts on the unique values of the area.

Windpower development near the North Platte River would negatively affect the river experience for some people by creating new visual impairments on the horizon. If windpower facilities were located close enough to the river, there also could be audible impacts on SRMA visitors.

Impacts from recreation management actions would include improved river access, camping and recreational opportunities, and dispersed visitor use along the river.

Watershed management actions in the Sage Creek watershed would improve water quality and reduce sediment loading in the North Platte River.

The North Platte River is bald eagle habitat, which would limit the location of campgrounds and river access points. However, this would also limit industrial development along the river corridor, enhancing the recreational experience through preservation of the pristine setting.

4.13.20.2 Impacts Under Alternative 1: Continuation of Existing Management

Intensively managing surface disturbance from lands and realty actions, oil and gas exploration and development, locatable mineral entry, and mineral material disposals within one-quarter mile of the SRMA would preserve the quality of the recreation experience and visual resources along the North Platte River. Lands and realty management actions, including land acquisitions, would improve public access to the SRMA and disperse visitor use along the river.

Construction of new access and campgrounds would disperse visitor usage and enhance the recreational experience and sense of solitude along the river. Management of river outfitter permits would further disperse visitor usage.

Transportation and access management actions would improve access and disperse visitor usage, which would enhance the quality of the recreational experience.

Insufficient weed treatments would allow invasion and proliferation of noxious and invasive weed species. Noxious and invasive weeds would limit access to the river by creating physical barriers to foot traffic in localized areas, lead to increased erosion, and degrade water quality and wildlife and fish habitat. Proliferation of noxious and invasive weeds would reduce wildlife visitation and use along the river corridor and would directly affect the recreational experience.

The VRM class III designation does not afford protection to the recreational experience. Developments would be allowed that are visible from the SRMA, compromising the visual integrity of the setting.

Summary

Lands and realty management actions to improve access to the river would help disperse usage and improve the recreational experience. Significant impacts from noxious and invasive weeds would occur, which would detract from the recreational experience along the river.

4.13.20.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from lands and realty, minerals management, transportation and access and VRM would be the same as those identified in Alternative 1.

Vegetation management would reduce invasion and proliferation of noxious and invasive weed species along the North Platte River. The increase in weed treatments for noxious and invasive weeds, such as knapweed, leafy spurge, and tamarisk, would minimize proliferation into native plant communities and maintain the value of the wildlife habitat. Noxious and invasive weed management actions would improve access to the river, wildlife and fish habitat, and water quality, all of which would improve the recreational experience.

Summary

Lands and realty management actions to improve access to the river would help disperse usage and improve the recreational experience. Noxious and invasive weeds management actions would improve the overall recreational experience.

4.13.20.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from the management of the North Platte SRMA would be the same as those identified in Alternative 1.

Impacts from minerals management would be similar to those under Alternative 1, except that the North Platte River SRMA would be closed to the operation of the public land laws over a greater area (12,740 acres). This would provide enhanced protection of the recreation experience and visual resources within the SRMA. In addition, the SRMA would be closed to mineral development within one-half mile of the river. This closure would result in enhanced protection of the recreation experience and visual resources

within the SRMA, unless development activities occur outside the one-half mile buffer and create noticeable dust or noise.

Surface disturbing activities and other management actions from other resource programs would be intensively managed within one-half mile of each side of the North Platte River SRMA. This would preserve the quality of the recreational experience and protect the visual quality along the river.

Vegetation management actions would be the same as those found in Alternative 2.

The SRMA would be managed as VRM Class II to further protect the visual experience along the river. 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 would increase the protections to the recreational experience of the SRMA. However, because the majority of the SRMA is within intermixed landownership, this action would only effectively protect the setting if there were federal involvement in the proposed undertaking.

Summary

Visitor access would be limited to existing public access points along the river. A wider corridor on either side of the river and a VRM Class II designation would protect the recreational experience of the North Platte River SRMA. Noxious and invasive weeds management actions would improve the overall recreational experience.

4.13.20.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from transportation and access and VRM would be the same as those identified in Alternative 1.

Closure of the area to operation of the public land laws, oil and gas leasing, locatable mineral entry, and mineral material sales (5,060 acres) would protect the recreation experience and visual resources of the SRMA. Development activities occurring outside the SRMA might temporarily create noticeable dust or noise; however, this impact would be short term and minimal.

Acquisitions and easements would create new access points on the river, which would disperse recreationists and enhance a sense of solitude along the river.

Summary

Lands and realty management actions to improve access to the river would help disperse usage and improve the recreational experience. Noxious and invasive weeds management actions would improve the overall recreational experience.

4.13.21 Rawlins OHV Area

4.13.21.1 Impacts Common to All Alternatives

No impacts would be common to all alternatives.

4.13.21.2 Impacts Under Alternative 1: Continuation of Existing Management

The OHV area would not be an SRMA. OHV use would be limited to designated roads and vehicle routes with directional traffic, which would minimize accidents.

Minerals management actions would potentially reduce the quality of the OHV experience in the area. However, the potential for mineral development in the area is low.

Summary

OHV use would be constrained within the designated area, which would enhance public safety and minimize resource conflicts.

4.13.21.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Management actions would facilitate development and use of the area. OHV use would be open within the designated area; thus, desired contours for motocross events would not be constructed.

Closure of the SRMA to the public land laws, mineral material sales, and new mineral leasing would ensure that conflicts do not arise between OHV users and mineral development. Existing leases might still be developed but would be intensively managed to reduce conflicts from OHV users.

Summary

OHV use would not be constrained within the SRMA. Riders would have unrestricted use of the designated area. This would lead potential threats to public safety, and resource conflicts.

4.13.21.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Lands and realty and minerals management actions would have the same impact on the Rawlins OHV SRMA as Alternative 2.

OHV management actions would have the same impact on the Rawlins OHV SRMA as Alternative 1.

Summary

OHV use would be limited to a designed recreational course, which would improve public safety, limit resource damage, and minimize conflicts between users.

4.13.21.5 Impacts Under Alternative 4: Preferred Alternative

Management actions would have the same impact on the Rawlins OHV area as Alternative 3, except that the area would not be managed as an SRMA.

Summary

Impacts under this alternative would be the same as Alternative 3.

4.13.22 National Natural Landmarks

4.13.22.1 Impacts Common to All Alternatives

There would be negligible impacts on the NNLs from any management action under all alternatives.

4.13.23 Encampment River Potential Wild and Scenic River (WSR)

4.13.23.1 Impacts Common to All Alternatives

The area proposed for WSR designation falls entirely within the Encampment River Canyon WSA, which constrains the development of alternate interim management prescriptions. Protections afforded the WSA would protect the outstandingly remarkable characteristics of the river segment, unless Congress releases the canyon from wilderness consideration. For a description of the WSR designation process, see Appendix 3.

Cultural resource management would enhance the management of the Encampment River Canyon by providing protection and interpretive opportunities to the canyon.

The Encampment River would be designated an AMR area with emphasis on wildland fire suppression for the protection of vegetation and wildlife habitats. Because of its WSA status, restrictions would be placed on the type of suppression equipment used. These limitations could lead to an increase in acres burned by wildland fires. Burned areas would be subject to visual degradation, accelerated erosion, wildlife displacement, and loss of forage in the short term.

Lands within the WSR would be closed to operation of the public land laws, oil and gas leasing, surface disturbing activities, and locatable mineral entry. The outstandingly remarkable values and classification of the WSR would be protected by these actions. Closure of the area to the operation of the public land laws would prevent the possibility of removing this area from federal jurisdiction. Surface disturbing activities would not be allowed within the WSR except for abandoned mine reclamation, which would be considered on a case-by-case basis. This activity might result in short-term localized impacts on the visual setting and recreational experience from increased human presence and industrial activity.

Seasonal increases in recreational visitation would result in occasional user conflicts, detracting from the experience of solitude expected in a WSR. These impacts, if they occur, would be negligible. Recreational use, including horseback riding and the use of pack animals, would contribute to the proliferation of noxious and invasive weeds.

The WSR would be managed as a VRM Class I, which preserves the outstandingly remarkable character of the canyon through intensive management.

4.13.23.2 Impacts Under Alternative 1: Continuation of Existing Management

Surface disturbing activities would not be allowed within ¼ mile of the Encampment River. Geophysical exploration would be limited to foot access and the use of surface cables on public lands. Surface charges might be allowed following site-specific analysis. The outstandingly remarkable values of the WSR would be protected by these management prescriptions.

Vegetation treatments would be restricted to hand or aerial application. There would be impacts on the Encampment River Potential WSR from weed infestations along the Encampment River trail. The lack of weed treatments and the proliferation of cheatgrass would continue, resulting in the degradation of the qualities of the wild river, potentially resulting in compromising the WSR designation.

Summary

There would be a significant impact from the proliferation of invasive weed species, which would impact the outstandingly remarkable characteristics of the WSR. The area proposed for WSR designation falls

entirely within the Encampment River WSA, which constrains the development of alternate interim management prescriptions.

4.13.23.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Under this alternative, the Encampment River would not be proposed for WSR designation. The river segment would be protected as long as it retains its WSA status. If Congress were to release the WSA from wilderness consideration, some of the protections currently protecting the canyon would be removed. The land would revert to multiple use management.

Vegetation management actions would control the proliferation of noxious and invasive weeds within the area. Access to the river would be improved.

Summary

Although the river would not be designated a WSR, values would be protected under the management of the Encampment River Canyon WSA unless Congress were to release the WSA from wilderness consideration.

4.13.23.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Under this alternative, the Encampment River would be managed to maintain the outstandingly remarkable characteristics of the river segment (wild). For a description of the WSR designation process, see Appendix 3.

Surface disturbing activities would not be allowed within the viewshed of the Encampment River. This would effectively increase the buffer zone along the river and thereby minimize disturbance to vegetation communities and riparian function.

Vegetation treatments would be the same as those identified in Alternative 2.

Summary

This alternative would provide the most protection to the outstandingly remarkable characteristics of the proposed WSR, and significant impacts would not occur.

4.13.23.5 Impacts Under Alternative 4: Preferred Alternative

Impacts on the Encampment River would be the same as those in Alternative 1, except that surface disturbance would be prohibited within the viewshed of the river, rather than within one-quarter mile. This would effectively increase the buffer zone along the river and thereby minimize disturbance to vegetation communities and riparian function. Impacts from vegetation treatments are the same as those identified in Alternative 2.

Summary

Although protection level would not be as great as that under Alternative 3, the outstandingly remarkable characteristics of the proposed WSR would be protected, and significant impacts would not occur.

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 were to occur:

- Substantial limitation on public access to and travel within the RMPPA
- Substantial reduction in opportunity for access easement acquisition and road development.

Methods

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 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:

- 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 and use of public land resources.
- RFDs and RFAs can be found in Appendix 33.

4.14.1 Impacts Common to All Alternatives

Restrictions on surface disturbing activities associated with SMA management, vegetation management, water quality, watershed and soils management, and wildlife and fisheries management would modify the location and route of proposed roads. Seasonal restrictions to protect wildlife species would limit the window of opportunity for constructing roads and would preclude vehicle access during certain times of the year.

Placement of facilities (e.g., utility, communication sites, and energy developments) would enhance travel and access opportunities through the development of roads to access project sites. Restrictions on facility placement in areas with important resource values would limit the degree of increased access and travel opportunities. The upgrade of existing roads within existing oil and gas fields would accommodate increased traffic volume and thereby enhance travel opportunities.

Management of OHV use would not only facilitate safe travel within the RMPPA but also would restrict access and travel opportunities. Closing areas to OHV use, limiting use to designated roads and vehicle routes, and implementing seasonal restrictions would restrict travel and seasonal access in some areas. Seasonal closures to protect wildlife habitat from disturbance during critical periods would prevent

damage to saturated roads. Permanent road closures for public safety, to protect wilderness values, or to reduce fragmentation of critical wildlife habitat would reduce opportunities to access public lands in localized areas. High Savery Dam area (530 acres) and Ferris Mountain WSA (21,880 acres) are closed to OHV use.

4.14.2 Impacts Under Alternative 1: Continuation of Existing Management

Impacts from lands and realty management actions would result from the potential disposal of approximately 61,010 acres of BLM-administered public lands (Maps 2-22 through 2-25 and Appendix 7). Although this would eliminate public access to and travel within these areas, any disposal actions accomplished through exchanges would result in increased opportunity to access public land.

Roads constructed or upgraded to provide access to 8,945 well sites would provide increased opportunity for access to public lands.

Roughly 610 acres would be closed to OHV use, which would eliminate motorized access to the Encampment River WSR. Other OHV designations (limited and open) would maintain the existing transportation and access network.

Summary

Acquisitions and mineral development would improve access opportunities within the RMPPA. Road closures within Encampment River WSR would limit vehicle access to this area.

4.14.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from OHV use management would be the same as those identified in Alternative 1.

Impacts from lands and realty management would be similar to those identified in Alternative 1, except the area identified as potentially suitable for disposal would be reduced to 46,230 acres. This would reduce the potential for land disposals to reduce access and travel opportunities.

Impacts from oil and gas management actions would be similar to those identified in Alternative 1, except a total of 9,198 wells would be developed. This would increase the access to public land.

Summary

Impacts would be the same as those identified in Alternative 1, except for additional opportunities for access in mineral development areas.

4.14.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from lands and realty management would be similar to those identified in Alternative 1. However, no specific tracts of land would be identified for disposal.

Impacts from oil and gas management actions would be similar to those identified in Alternative 1, except a total of 8,632 wells would be developed. This would increase the access to public land.

Impacts from OHV use management would be similar to those identified in Alternative 1, except 67,730 acres would be closed to motorized travel in the WSAs. Other OHV designations (limited and open) would maintain the existing transportation and access network.

Summary

Impacts would be the same as those described in Alternative 1. All WSAs would be closed to OHV travel. Reduced mineral development would decrease transportation and access opportunities.

4.14.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from lands and realty management would be the same as Alternative 2.

Impacts from oil and gas management actions would be similar to those identified in Alternative 1, except a total of 8,822 wells would be developed. This would increase the access to public land.

Impacts from OHV use management would be similar to those identified in Alternative 1, except areas closed to OHV travel would be increased to 34,110 acres, which includes all WSAs with the exception of Adobe Town. Other OHV designations (limited and open) would maintain the existing transportation and access network.

Summary

Impacts would be the same as those described in Alternative 1. All WSAs, with the exception of Adobe Town, would be closed to OHV travel. Reduced mineral development would decrease transportation and access opportunities.

4.15 VEGETATION

This section presents the potential impacts on vegetation from other management actions. The first part of this section discusses vegetation. This section is followed by a discussion of Special Status Species plants and vegetation communities. The last section focuses on 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 were to occur:

- 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 the Endangered Species Act (ESA).
- Actions that have the potential to destroy sensitive plant species or substantially harm habitat of sensitive plant 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 noxious and invasive weeds where they already exist.

Methods of Analysis

Different program actions are assessed for their impacts on the vegetation resource. Activities impact flora resources by removing soil and vegetation. These impacts are either mitigated or avoided. 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 will occur within populations and habitats based on climatic, economic, and other conditions:

- The livestock type and stocking rate will remain relatively stable over the planning period.
- Wildlife populations will remain relatively stable over the planning period.
- Wild horse populations will remain relatively stable 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 plant communities are functioning properly or are in the process of achieving proper functioning condition.
- Noxious and invasive weeds will continue to be introduced and spread as a result of ongoing vehicle 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 non-native invasive plant species.
- BLM will continue to treat noxious and invasive weeds and pests on public land. Livestock permit holders; ROW holders; and mineral lease, claim, and permit holders will continue to treat noxious and invasive weeds and pests on public land as stipulated within their permits and authorizations.
- Weed and pest control will be carried out in coordination with the appropriate county weed and pest control district and owners of adjacent property.

- As more monitoring and survey data become available, it is possible that additional populations of existing threatened or endangered plants might be found within the RMPPA.
- Management of threatened and endangered plant species is subject to the ESA.
- Wildland fire burns 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 Species plants 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 noxious and invasive weeds. Noxious and invasive weeds can outcompete native vegetation through mechanisms such as the noxious and invasive weeds' ability to change soil chemistry. They also can produce numerous seeds early in the growing season and the rapid growth of 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 noxious and invasive weeds have invaded, the ecology of the area is altered, and native plants that provide habitat and forage for animals would be reduced or eliminated. Some of the costs of weed proliferation are loss of forage, decreased animal health, devaluation of animal commodities, equipment decontamination, and reduced land values.

The invasion and proliferation of noxious and invasive weeds increases the cost of weed control to entities responsible for their control. If noxious and invasive 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 chemical herbicides designed to kill the noxious and invasive weeds with minimal impacts on native vegetation.

The approved RFO Noxious Weed Prevention Plan (Appendix 31) includes BMPs for surface disturbances, roads, vehicles, livestock, recreation sites, and wildland fire and prescribed fire designed to eliminate or minimize impacts on or 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 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 would cause minor surface disturbance and vegetation removal; however, standard protection measures and required reclamation practices would mitigate any effects to acceptable levels. The areas described are small (under 1 acre), with vegetation disturbance localized and temporary.

Cultural sites are often found in the sand dune areas within the RMPPA. These are also important vegetation sites that often hold Special Status Species plants and plant communities. Before cultural

excavations are conducted in these areas, a vegetation inventory would be conducted. If Special Status Species plants or plant communities are found in these areas, they would be avoided, thus causing minimal to no effect on Special Status Species plants or their 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 associated with cultural site excavations is less than 1 acre per excavation and these sites are reclaimed immediately. Therefore, impacts would be minimal.

Surface disturbance resulting from fireline construction, use of heavy equipment, and other fire suppression activities would damage vegetation and accelerate natural soil erosion in localized areas. However, these small areas would be quickly rehabilitated to minimize long-term impacts.

Wildland and prescribed fires result in short-term loss of vegetation. The vegetation response to fire is dependent on the size, location, intensity, season, timing, and amount of precipitation; preexisting plant community condition; and the abundance of noxious and invasive weeds in the area. Fires change the composition of the plant community, set back plant succession, and remove woody vegetation and plant litter. Wildland and prescribed fires might burn with enough heat to kill soil organisms and root systems, resulting in diminished plant recruitment and growth rates, particularly for fire-sensitive species.

Although fires would have short-term localized impacts on vegetation, the long-term effect of fire would be improved vegetation production, nutritional value, and a more diverse plant community (e.g., diverse species, cover, and age class). However, this would occur on relatively small acreages and plant communities as a whole would generally remain unchanged (late seral condition). Fuel reduction projects in WUIs would result in early- to mid-seral plant communities. However, this would also occur on a small scale.

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. Fire-sensitive shrubs and trees would eventually reestablish on burned sites. Fire-dependent species, such as aspen communities, would benefit from fires with an increase in community composition, vigor, and overall health.

Wildland fires affect Special Status Species plants and plant communities by temporarily removing above ground vegetation, changing plant community composition, setting back plant succession, and removing woody vegetation and plant litter. If Special Status Species plants are dependent on a specific seral stage or associative plants, a wildland fire can upset the ecological balance that supports a sensitive plant's habitat or plant community. Wildland fires might also enhance the habitat for Special Status Species plants and serve as a catalyst for their reestablishment and proliferation.

Wildland fires create an opportunity for the establishment or spread of noxious and invasive weeds by removing above ground vegetation, leaving burned areas more susceptible to noxious and invasive weeds. Some species of noxious and invasive weeds respond well post-fire and 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 their equipment might also introduce or spread noxious and invasive weeds. Some mechanical control activities disturb the soil surface and remove vegetation, creating an opportunity for the establishment or spread of noxious and invasive weeds.

Noncommercial forestlands would be managed primarily to sustain 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 result in increased vegetation diversity, altered successional status, increased plant vigor, increased available water for herbaceous vegetation, and improved watershed health.

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. Shrubs will return over a longer time period. Long-term impacts would mostly be associated with the construction of access routes. Increased erosion and decreased vegetation cover would occur from soil compaction and the channelization of surface runoff in ruts and road ditches. Areas below mid-slope roads become drier, which reduces plant productivity and can potentially change species composition.

When proposed ROWs go through sites of Special Status Species plants and plant communities, the project would be rerouted to avoid the site. Potential habitat of threatened and endangered 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 (BLM 2004b) would be implemented. These requirements would reduce disturbance to threatened and endangered (T&E) species. Because proposed ROWs are surveyed before lands and realty actions, new locations of threatened and endangered plant communities might be located, increasing knowledge of these plant species.

Land tenure adjustment would consider the presence of T&E plants, and a vegetation analysis would be conducted to ensure the maintenance of these sites and habitats. Where known populations of these species occur, withdrawals from locatable mineral entry would ensure that they were protected.

Lands and realty management actions usually result in surface disturbance, which increases the land susceptibility to weed invasion or spreads existing weed patches. Land proposed for exchange or acquisition would be inventoried for noxious and invasive weeds to ensure noxious weed infestations would not be inherited. Timely reclamation of disturbed areas diminishes the probability of weed proliferation in these areas. Failure to comply with existing weed control stipulations would increase weed abundance and proliferation.

Impacts on vegetation resulting from livestock grazing management actions include the removal of forage by livestock, which might alter the amount, condition, and vigor of vegetation in grazed areas. Impacts from livestock grazing are usually related to a long duration of use during the growing season, resulting in lower vigor of desired species and a change in species composition. Salting areas and bed grounds often have disturbed soil and a loss of plant cover, which usually results in localized areas dominated by invasive plants. Livestock grazing 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 composition, cover, and the vigor of vegetation. These provide rest periods for plant growth and seed production to maintain plant vigor. The objective of these strategies is to maintain or reach rangeland standards for wetland/riparian areas and upland plant communities. The response of vegetation to these strategies would be monitored, and adjustments would be made accordingly to achieve the desired response (Appendix 17). The use of riparian pastures and exclosures increases the density, age class, and cover of desirable riparian plants, including willow, cottonwood, and herbaceous wetland/riparian plants.

Range improvements would continue to occur at current rates to reach rangeland improvement goals. The types of projects would vary from year to year based on resource needs and priorities. All range improvements would result in minor and short-term disturbances to vegetation, including loss of

vegetation cover and changes in plant composition and vigor adjacent to each project. The use of range improvements is intended to improve the control of livestock grazing.

Livestock grazing sometimes maintains or creates habitat for sensitive plants by creating disturbance areas or by reducing vegetation competition. However, livestock grazing would potentially reduce the occurrence of some plants as a result of trampling or consumption. Roughly 15 acres are excluded from grazing to protect the sensitive plant Gibben's beardtongue. Known locations of threatened or endangered plants would be avoided when planning range improvements to decrease potential loss of these Special Status Species plants.

Livestock can transport seeds and fruits of invasive species to other areas where they are spread by the animal physically removing the seed or fruit, or through the 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. The overuse of native vegetation in areas where best management practices have not yet been implemented might increase the susceptibility of an area to weed invasions. Grazing plans that promote healthy rangelands and vegetation create conditions resistant to the spread of noxious and invasive weeds.

The exclusion of domestic sheep and goats within 9 miles of bighorn sheep habitat would preclude the use of domestic sheep as a method of controlling noxious and invasive weeds within these areas. This would reduce the possibility of passing diseases to big horn sheep populations, but might result in use of less effective weed control methods. The increased use of chemicals or mechanical treatments for weed management might not be as effective in controlling the spread of noxious and invasive weeds into rangelands and wetland/riparian habitats.

Minerals 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. Increased erosion and decreased vegetation cover would occur from soils compaction and the channelization of surface runoff in ruts and road ditches. Areas below mid-slope roads become drier, which reduces plant productivity and can potentially change species composition. Similar impacts would occur for leasable, locatable, or common variety minerals. The regulatory authorities, although they might differ among the mineral categories, 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 can benefit vegetation resources by increasing total perennial plant cover in contrast to plant cover present on adjacent undisturbed areas. The presence of threatened or endangered species could be identified as a result of baseline studies conducted in connection with new mineral development. Plant surveys are conducted in potential habitat for all surface disturbing projects, which identify wildlife habitats and aid in developing vegetation maps and baseline data. In addition, reclamation activities provide opportunities for experimentation and refinement of revegetation techniques and processes. Native grasses and forbs would dominate reclaimed sites in the short-term. Shrubs will return over a longer time period.

Quarries and mines associated with locatable and saleable minerals typically disturb 1 to 20 acres of vegetation during operation of the project. Disturbances result in the loss of vegetation cover, density, and composition changes. Reclamation is necessary for reestablishing plants on these disturbed areas.

Reclamation should increase plant species diversity and lower the seral stage of the community by replacing shrubs with grasses and forbs.

Quarries associated with sand, gravel, and other aggregates typically disturb 1 to 20 acres of vegetation during the operation of the quarry. Disturbances include loss of vegetation cover, density, and composition changes. Reclamation of these areas is necessary for reestablishing plants on these areas. When completed properly, reclamation should increase plant species diversity and lower the seral stage of the community by replacing shrubs with grasses and forbs.

OHV use would result in impacts on vegetation, such as loss of vegetation cover, density, and composition changes. 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 noxious and invasive weeds, including new invasive species. OHV activities in undisturbed and remote areas have the potential to distribute weed seeds into weed-free areas.

Paleontology excavation and research activities cause short-term, small, and localized impacts on vegetation by disturbing and removing the topsoil. Reclamation mitigates these impacts. Impacts on special status plants would be avoided or mitigated by paleontology activities.

Recreational activities, such as camping, hiking, and backpacking would result in localized vegetation disturbance from trampling. Permitted recreational activities would not be authorized in known locations of Special Status Species plants if a potential existed to adversely impact the plants. Activities that do not require a permit, such as camping outside developed campgrounds, might cause minor impacts on sensitive plants and their habitats. Recreational activities would introduce and spread noxious and invasive weed seeds from vehicles, shoes, clothing, and recreational equipment. As recreation use increases, people from outside the area would bring in noxious and invasive weeds, including new invasive species. Recreation activities that occur in undisturbed and remote areas have the potential to distribute weed seeds into weed-free areas.

Increases in the region's population and increases in visits to the RMPPA would impact vegetation and the demand on it for a 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 minimal. Conversely, education of the public who use and value these resources creates advocates for the natural ecology and traditional uses of the vegetative resources, which might have long-term benefits to vegetation resources. As the public becomes aware of their impacts, the public would learn to use techniques that are less harmful to vegetation in the RMPPA.

The closure of roads within WSAs reduces the potential for vehicles distributing noxious and invasive weeds, compacting soil, and damaging vegetation because vehicles are limited to boundary roads. Restrictions on surface disturbance in 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 the remainder of the RMPPA. Visitor use and access is promoted in SRMAs, resulting in increased vegetation disturbance from trampling.

The Interim Management Policy for WSAs prohibits or restricts motorized equipment use, which would limit weed treatment options in these areas. In addition, the restriction on motorized travel results in less surface disturbance overall in the WSAs. However, dispersed hiking and equestrian use would increase the potential for the introduction or spread of noxious and invasive weeds. Designation of SMAs would

increase popularity and visitation resulting in increased potential for the introduction and proliferation of noxious and invasive weeds to these areas.

Expansion of the transportation network would result in the permanent loss of vegetation. Areas disturbed during road construction and not part of the permanent road would be reclaimed. New transportation corridors would avoid Special Status Species plant communities. Because proposed projects are reviewed before construction, new locations of Special Status Species plant communities might be located, increasing knowledge of these plant species. Transportation corridors typically have the highest density of noxious and invasive weeds occurring in the region. Weed infestations throughout the RMPPA can mostly be attributed to on- and off-road vehicle dispersion and from construction and maintenance activities.

Impacts from vegetation treatments are short-term losses of vegetation and changes in plant structure. In the long term, treatments would increase health and vigor the vegetation community, increase vegetation diversity, modify vegetation types (i.e., changes from shrubs to herbaceous vegetation) and modify age class and structure. The nature and uses of various types of treatments are discussed in Appendix 19. A review would be conducted before any vegetation treatment or other vegetation management action (exclosures) to ensure the activity would not result in the loss of Special Status Species plants.

Special Status Species plant communities (because of their limited size and distribution) would be adversely impacted by the spread and proliferation of noxious and invasive weeds. Impacts would be controlled through aggressive use of noxious and invasive weed treatments.

Weed management actions would control some noxious and invasive weed populations resulting in healthier native plant communities. Mechanical vegetation treatments would increase the potential for the establishment of noxious and invasive weeds attributed to increased soil surface exposure. 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.

VRM Class I and II areas would negligibly impact the timing or extent of vegetation treatments. There would be no impacts on Special Status Species plants from VRM. There would be no impacts on noxious and invasive weed management from VRM.

Effective watershed management would result in healthy and diverse plant communities. The restriction of surface disturbance around wetland/riparian areas, perennial surface waters, identified flood plains, and ephemeral channels would further protect vegetation from disturbance. Consideration of water quality standards and watershed guidelines during construction of other program projects would assist in achieving the desired plant and litter cover objectives. Developed water sources on uplands would be used to reduce livestock concentrations in wetland/riparian areas. The use of exclosures to protect seeps and springs precludes grazing in these areas. These improve species composition, vigor, and cover in wetland/riparian habitat.

Management actions aimed at maintaining or improving soil conditions and minimizing soil erosion would also maintain or improve the condition of vegetation. Watershed management actions would consider impacts on sensitive plants and avoid negative impacts on these communities. Maintenance of good soil condition would enhance the viability, vigor, and abundance of Special Status Species plants and plant communities. Where accelerated erosion or other soil disturbing activities are affecting these species, measures would be taken to reduce or prevent the loss of habitat.

Effective watershed management would result in healthy and diverse plant communities and would minimize the establishment of noxious and invasive weeds. Minimizing erosion and protecting the soil would help decrease the potential for weed establishment and spread.

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. Riparian areas and other Special Status Species plant communities would be avoided during gathering operations. Wild horse population objectives are designed to avoid long-term impacts on plants and vegetation communities.

Wild horses impact riparian vegetation around watering locations by trampling and grazing plants, and compacting the soil, which reduces riparian species cover and diversity. Protection and development of seeps and development of alternative water sources mitigate impacts of wild horses on wetland/riparian habitat. The distribution, population, and grazing intensity of wild horses might change or delay vegetation treatments, and vegetation recovery following a treatment might be slowed if concentrated year-round use by wild horses occurs.

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 noxious and invasive weeds.

Most wildlife grazing has little impact on vegetation because wildlife often move frequently and do not regraze forage unless they are confined. Minor effects to vegetation occur from wildlife trails, bedding areas, and other congregation areas. Wildlife concentration areas, where shrubs are heavily used, exhibit vegetation shifts from sagebrush, bitterbrush, and mountain mahogany to conifers, grasses, forbs, annuals, and occasionally bare ground. Extensive browsing of desirable shrubs in riparian habitat might impact the density, height, and vigor of willows, aspen, waterbirch, cottonwood, dogwood, and currant. Prairie dogs affect the density and type of herbaceous vegetation around their towns. Beaver lower the density of willows, aspen, and other streamside vegetation, although the ponds that beaver create often raise the water table, allowing for more extensive areas of water loving shrubs and herbaceous plants. However, when beaver dams wash out, the drained pond area provides bare ground where willow would establish. The distribution, population, and grazing intensity of wildlife might change or delay vegetation treatments, and vegetation recovery following a treatment might be slowed if use by wildlife occurs.

Management of wildlife and fish habitat would have minimal impact on Special Status Species plants and unique plant communities. Wildlife can 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, such as crucial winter range or prairie dog towns, are particularly vulnerable to infestations of noxious and invasive weeds.

4.15.2 Impacts Under Alternative 1: Continuation of Existing Management

Limitations on surface disturbing activities would protect vegetation resources associated with the cultural sites, which in turn would maintain or enhance forage conditions at the site.

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 to early and mid seral, creating more diverse plant communities. Many otherwise small and manageable fires would

potentially burn larger areas. Wildland fires would be suppressed unless they met the criteria for a wildland fire for resource benefit. Wildland fire would be used to maintain and improve fire dependent plant communities. This alternative would require less line construction and other surface disturbance resulting in reduced impacts on plants.

Forest management actions, including small timber sales, firewood gathering, and other permitted activities might result in the introduction and/or spread of noxious and invasive weeds. The vehicles, equipment, animals, and operator's clothing transport weed seed 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.

Forest management actions that would impact vegetation are tree thinning, timber harvesting, and other practices used to improve forest health. The impacts of thinning on vegetation include increased vigor of the remaining trees and a more open tree canopy, which increases herbaceous plant cover. Fuel reduction would also reduce the frequency and intensity of wildland fires. Harvesting of commercial forestlands would increase herbaceous vegetation in the short term. 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 impacts of these actions on vegetation would result in fewer trees but would lower fire potential because harvested areas could serve as buffer areas for wildland fires.

Known locations of special status plants would be avoided or mitigated by the timber harvesting plan to ensure the stability of Special Status Species plant species and communities. Firewood gathering and Christmas tree cutting would be restricted if Special Status Species plants and plant communities were harmed by these activities.

Managing to meet the Standards for Healthy Rangelands (BLM 1997) changes plant community composition and can be used to increase the health and diversity of natural vegetative systems. Additional development of range improvement projects would help reduce effects associated with the concentration of livestock, such as reduced spread of noxious and invasive weeds and removal of vegetation cover.

Minerals management impacts on Special Status plant species would be negligible as a result of required mitigation measures (i.e., avoidance). Because proposed developments are reviewed before permitting, new locations of special status plant communities might be located, increasing knowledge of these plant species.

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.

Allowing OHV travel off existing roads and vehicular routes to retrieve big game kills and to access primitive campsites would increase disturbance from OHVs and trampling by humans, increasing vegetation damage in these localized areas.

Under Alternative 1, vegetation treatments would occur on an average of 2,500 acres per year, or 50,000 acres over the next 20 years would be treated. 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 acres treated annually, the seral condition class would remain predominantly late (e.g., dominated by mature to decadent vegetation). Reintroduction of wildland fire into the ecosystem would increase ecological diversity, vegetation structure, and age class distribution. Herbaceous cover would continue to be inadequate for watershed protection, and exhibit lower vigor and production.

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. Noxious and invasive weeds would remain untreated on roughly 15,000 acres. 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.

Effective watershed management would result in healthy and diverse plant communities and would minimize the establishment of noxious and invasive weeds. Minimizing erosion and protecting the soil would help decrease the potential for weed establishment and spread. Avoiding surface disturbance would minimize impacts on vegetation in identified 100-year flood plains, areas within 500 feet from perennial waters, springs, wells, and wetland/riparian areas, and areas 100 feet from the inner gorge of ephemeral channels.

Wildlife habitat management restrictions would impact vegetation treatments by decreasing the window of opportunity, changing the scale, and/or location of proposed projects.

Summary

There would 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 and 5,733 acres (287 acres per year) from lands and realty management actions would be susceptible to weed invasion. Approximately 47,479 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. Other than cheatgrass and musk thistle, weed invasion following wildland fires has been minimal.

4.15.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from cultural resource management, OHV management, and water quality, watershed, and soils management would be the same as those identified in Alternative 1.

Increasing fire suppression efforts would decrease the likelihood of high-intensity fires in the short term. However, this action would also allow fuel accumulation to continue, which could lead to an increased number of wildfires in the long term. Fuels treatments would increase tenfold compared with Alternative 1, resulting in an overall shift in plant communities to more early and mid-seral conditions.

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

(from 4,000 acres to 2,000 acres) would reduce opportunities for weed invasion. The tenfold increase in vegetation treatments would provide more opportunity for the potential establishment or proliferation of noxious and invasive weeds. However, mitigation measures and increased weed treatments would be implemented to minimize the potential.

Forest management actions would increase the impact on vegetation and on noxious and invasive weeds by doubling the allowable level of commercial timber harvest and associated activities compared with Alternative 1. Additional human presence and vehicles would increase ground disturbance and the spread of noxious and invasive weeds. Other impacts are the same as Alternative 1.

Impacts to vegetation, special status plant species, and noxious and invasive weeds under this alternative would be similar to Alternative 1 because grazing management would still be required to meet Standards for Healthy Rangelands (BLM 1997). Therefore, the Alternative 2 objectives, which are to emphasize commodity production, would have minimal effect on vegetation.

The change in emphasis of range improvements to develop more reliable water sources, including larger reservoirs, would increase the acreage of vegetation disturbed. 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.

Impacts from minerals management would be greatest under Alternative 2. Additional disturbances from increased oil and gas development would increase impacts to vegetation. These communities are abundant in the RMPPA. Approximately 63,649 acres of disturbance would occur during the planning period—an increase of 3 percent compared with Alternative 1. Reclamation would restore approximately 46,636 acres (73 percent); however, reclamation cannot guarantee that the vegetative community would return to its original composition.

Occupied special status plant habitat would be protected; however, potential habitat for expansion of these species would not be protected; consequently, opportunities for population increases would be reduced.

The maintenance or attainment of PFC in riparian areas would result in lower seral plant communities exhibited by herbaceous dominated communities that would otherwise be dominated by woody plants. An estimated 24,400 acres per year would be treated, 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. 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 replace it and other shade tolerant species (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. State-sensitive species would not be analyzed on a case-by-case basis, which would potentially increase disturbance to these sensitive species' habitat.

Placing priority for weed management actions on areas where commodity benefits would be enhanced would positively affect vegetation resources. Increased activity levels associated with increased

commodity production would result in more disturbed acres and larger size of vegetation treatments, increasing the opportunity for weed invasion and proliferation.

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 increased time periods for weed treatment and habitat manipulation projects.

Summary

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.

The disturbance of 63,663 acres of vegetation (3,183 acres per year; a 3-percent increase) from minerals management actions and 5,733 acres (287 acres per year; no change) from lands and realty 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 (from 4000 acres to 2000 acres per year), which would also decrease opportunities for weed invasion and expansion.

Sensitive species and unique plant communities would not be analyzed on a case-by-case basis, which would potentially increase disturbance to these sensitive 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 would slow the proliferation of noxious, invasive, and poisonous weeds.

4.15.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

In addition to impacts from cultural resources management under Alternative 1, increased limitations on surface disturbing activities on and near cultural sites would protect vegetation resources associated with the cultural sites.

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 under this alternative, which would double (4,000 acres to 8,000 acres annually) the acreage burned 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 fires would be suppressed unless they met the criteria for a wildland fire for resource benefit. Wildland fire would be used to maintain and improve fire-dependent plant communities. This alternative would require less line

construction and other surface disturbance resulting in reduced disturbance to and loss of plants and less acreage where weed invasion could occur.

Fuel treatments would increase fivefold compared with Alternative 1, resulting in an overall shift in plant communities to more early and mid-seral conditions.

Forest management actions—specifically, the termination of commercial timber harvesting—would increase woody vegetation, fuel loading, and the age class structure of conifer stands. Understory diversity and production would decrease. The potential for resource damaging wildland fires, insect infestations, and disease would increase. Plant species adapted to late seral forest communities would benefit from Alternative 3.

The elimination of commercial timber harvesting would reduce the surface disturbance that might lead to establishment of noxious and invasive weeds and would reduce the potential to disturb Special Status Species' habitat.

Vegetation disturbance would be reduced because of less new ROW activity, which reduces opportunities for the spread of noxious and invasive weeds.

Alternative 3 emphasizes the implementation of range improvements and management plans to meet DPC objectives, which would improve overall vegetation health. Implementation of this alternative would ensure vegetation impacts from grazing are minimized, and range improvements would emphasize modification of fences and small-scale water developments, resulting in reduced disturbance to vegetation. The exclusion of bison from grazing blocked public lands (amounting to 60 percent of the RMPPA) would limit grazing prescriptions using bison to manage the vegetation resource.

Establishing the Chain Lakes, Pennock, and High Savery areas as vacant allotments would result in improved vegetation management in other allotments. During drought years, following wildland fires or after vegetation treatments, these vacant allotments could be used instead, effectively reducing impacts to vegetation. During a normal year, forage on the vacant allotments would be available for wildlife, which might reduce grazing pressure on the other allotments. This would result in healthier vegetation.

Impacts from minerals management actions would be the same as under Alternative 1, except that fewer acres of vegetation would be disturbed 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 (73 percent). However, reclamation cannot guarantee that the vegetative community would return to its original composition and function.

Impacts on Special Status Species from minerals management would be the same as under Alternative 1. Impacts on noxious and invasive weeds under this alternative would be the same as under Alternative 1, except fewer acres of vegetation would be disturbed as a result of decreases in oil and gas development resulting in decreased potential for weed invasion.

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 these areas from vegetation damage by OHV use.

Designation of the Blowout Penstemon ACEC would protect and enhance existing and potential habitat, which would maintain or increase populations of this endangered plant species.

Upland and riparian areas would be managed to meet DPC objectives. This effort would result in a landscape consisting of early, mid, and late seral stage communities with a mixture of herbaceous and multi-aged woody species, more stable soils, 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, but seral conditions would remain in a higher proportion of late seral than desired. Small treatment areas would create more surface disturbance from fire perimeter control and fires would burn slower, increasing mortality to fire-sensitive species.

Weed control treatments would occur on 28,542 acres per year, which would reduce and control weed infestation, where possible, from native communities in the long term. The priorities for treatment of noxious and invasive weeds would be to maintain weed free, native communities, and unique communities to maintain their natural values. Native vegetation communities are often healthy and are not conducive to invasive weed infestations. Areas with established noxious and invasive weed patches would be treated to contain weeds, which would protect adjacent native plant communities from invasion. The increase of smaller vegetation treatments would create more surface disturbance from fire perimeter control and fires would burn slower (and hotter), increasing the opportunity for establishment of noxious and invasive species.

Impacts from water quality, watershed, and soils management would be similar to Alternative 1, except prohibiting surface disturbance (instead of avoidance) would eliminate impacts to vegetation in identified 100-year flood plains, areas within 500 feet from perennial waters, springs, wells, and wetland/riparian areas, and areas 100 feet from the inner gorge of ephemeral channels.

Provisions concerning the Encampment River Watershed and protection for municipal water supplies would reduce surface disturbing activities such as permanent roads or structures, and promote grazing management and forest management actions to meet watershed objectives. This would result in healthier vegetation communities with increased plant vigor and cover.

Increased wild horse AML numbers in the Lost Creek HMA (from 70 to 165 adults) 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.

Additional sensitive habitat restrictions (such as NSO on 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 impacts on vegetation, which could increase grass dominance on shrub rangelands. Conversely, water developments in big game crucial winter range would potentially lead to big game remaining on winter ranges longer, thereby reducing forage availability and quality in the long term.

Summary

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.

The disturbance of 56,505 acres of vegetation (2,828 acres per year; a 10-percent decrease) from minerals management actions and 5,733 acres (287 acres per year; no change) from lands and realty management actions would be susceptible to weed invasion. Approximately 44,029 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 increased (from 4,000 acres to 8,000 acres per year), which would also increase opportunities for weed invasion and expansion.

Treatments (28,542 acres annually) would keep up with the introduction 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 their communities.

4.15.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from lands and realty and wild horse management would be the same as under Alternative 1.

Impacts from cultural resource management and SMA management would be the same as those identified in Alternative 3.

Wildland fire management actions would be similar to those under Alternative 1, except fuel treatments would increase four to eight times resulting in an overall shift in plant communities to more early and mid-seral conditions.

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 and vegetation stability on steep slopes and riparian areas. Impacts to other upland areas would be similar to those described in Alternative 1. There would be no impacts from forest management to Special Status Species under this Alternative 1.

Impacts from livestock grazing management on vegetation would be the same as Alternative 1, except emphasis would be placed on achieving DPC, which would result in improved vegetation composition and health in upland and riparian areas.

Establishing the Chain Lakes, Pennock, and High Savery areas as vacant allotments would result in improved vegetation management in other allotments. During drought years, following wildland fires or after vegetation treatments, these vacant allotments could be used instead, effectively reducing impacts to vegetation. During a normal year, forage on the vacant allotments would be available only for wildlife, which may reduce their use on other allotments. This would result in healthier vegetation. Impacts to Special Status Species, unique plant communities, and noxious and invasive weeds would be the same as under Alternative 3.

Impacts from minerals management would be similar to Alternative 3. 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 (73 percent). However, reclamation cannot guarantee that the vegetative community will return to its original composition and function. Impacts to Special Status Species and noxious and invasive weeds under this alternative would be the same as under Alternative 1.

Limiting OHV travel for retrieving big game kills and camping within 300 feet of designated roads and vehicle routes would reduce disturbance to these areas, thereby limiting potential vegetation damage by OHVs.

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, increased vegetation production, and diversity. Vegetation treatments would occur on about 16,400 acres per year and help achieve DPC objectives. Prescribed fire treatments would reintroduce fire into fire-dependent plant communities on a landscape scale from which it has been absent. Reintroduction of fire would increase ecological diversity, vegetation structure, and age class distribution on a landscape scale.

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. There would be an increase in vegetation treatments, which would create more opportunities for establishment of noxious and invasive species. Treatments would occur at a pace (25,000 acres annually) that would keep up with the introduction and proliferation of noxious and invasive weeds in the RMPPA in the long term. In the short term, some infested acreage would continue to result in the decline of plant diversity and productivity and provide the seed source for further expansion into native rangelands as noxious and invasive weeds displace native plants. 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.

Provisions outlined in this alternative concerning the Encampment River Watershed and protection for municipal water supplies would reduce surface disturbing activities (e.g., construction of permanent roads or structures) and promote grazing management and forest management actions to meet watershed objectives. This effort would result in healthier vegetation communities with increased plant vigor and cover.

Wildlife management actions to achieve the objectives of maintaining vegetation condition and reducing long-term disturbances to provide quality wildlife habitat would impact vegetation by improving vegetation cover, diversity, and vigor. However, vegetation seral stages would be manipulated to provide the proper vegetative habitat for wildlife, which would influence the type, timing, and size of the vegetation treatment used.

Summary

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. 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 and 5,733 acres (287 acres per year; no change) from lands and realty 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 (4,000 acres per year) and suppression efforts would continue to create opportunities for weed invasion and expansion.

Significant impacts to weed management are unlikely because most of the actions are designed to preserve and protect vegetation resources. Treatments would occur on a scale (25,000 acres annually) that in the long term would control the introduction and mostly control the proliferation of noxious and invasive weeds in the long term.

There would be no significant impacts to special status plants or their communities.

4.16 VISUAL RESOURCES

VRM provides management actions 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.

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 8.x computer software, and information provided by other agencies. Effects are quantified where possible. 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.
- The checkerboard land pattern along the original Union Pacific Railroad (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 minerals 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

Cultural resource management actions would benefit VRM Class II by intensively managing any surface disturbing activity that modifies the visual setting of historic properties where the setting contributes to NRHP eligibility.

Use of fire for resource benefit would increase the size of wildland fires. Larger burned areas would create short-term visual obstructions and could create an uneven form and line in the visual horizon.

Surface disturbances 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 could alter the character of the visual landscape in some VRM

classifications. Belowground utilities and some aboveground facilities would be compatible with VRM Class II if properly mitigated using BMPs (Appendix 15). Management actions involving surface disturbance and construction of facilities would be approved within Class II designations with adequate mitigation.

Prescribed fire would create a natural appearance within the characteristic landscape, as a result of the ash and charred appearance or straight-line treatment edges that might be visually unattractive to some viewers. Impacts would be short term, depending on the spatial arrangement, vegetation mosaics, and proximity to key observation points.

4.16.2 Impact Under Alternative 1: Continuation of Existing Management

VRM Class II designation within the checkerboard area would be difficult to manage. The checkerboard land ownership reduces BLM's ability to effectively manage for visual resources. Surface disturbing activities located on private lands are not subject to the same restrictions and stipulations for preservation of VRM Class. These actions might have impacts that carry over to the adjacent BLM lands and reduce the quality of visual integrity.

Summary

VRM Class II designation within the checkerboard area would be difficult to manage because of a lack of BLM control on adjacent private property. Surface disturbing activities designed to be consistent with the VRM Class would maintain VRM classifications.

4.16.3 Impacts Under Alternative 2: Emphasis on Development of Resources

VRM Class II acreage would be reduced around the Pathfinder and Seminoe Reservoirs and would be eliminated in the Shirley Mountains and the checkerboard land ownership pattern as a result of suitability and manageability issues. These areas are better suited as VRM Class III areas; thus, these 125,680 acres would not be protected from major visual intrusions.

Summary

The checkerboard and intermixed land ownership areas would be designated VRM Class III because of the lack of BLM control on adjacent private property. Surface disturbing activities designed to be consistent with the VRM Class would maintain VRM classifications.

4.16.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

The 5-mile visual corridor of the Historic Trails ACEC and the JO Ranch buildings and the 2-mile visual horizon would be protected as VRM Class II under this alternative. The majority of the Historic Trails ACEC is within the checkerboard. VRM Class II designation within the checkerboard area would be difficult to manage. The checkerboard land ownership reduces BLM's ability to effectively manage for visual resources. Surface disturbing and disruptive activities located on private lands are not subject to the same restrictions and stipulations for preservation of VRM Class. These actions might have impacts that carry over to the adjacent BLM lands and reduce the quality of visual integrity.

VRM Class II acreage would be reduced around the Seminoe and Pathfinder Reservoirs and would be eliminated in the Shirley Mountains and the area with the checkerboard land ownership pattern. However, an additional 582,200 acres would be designated as VRM Class II as a result of managing the Historic Trails ACEC and Ferris Mountain viewsheds as VRM Class II areas.

Lands exhibiting wilderness characteristics that are located adjacent to the Adobe Town and Ferris Mountain WSAs would be designated as VRM Class II. The creation of VRM Class II acreage in these areas would preserve the visual horizon from key observation points, such as from Adobe Town WSA and access routes to the area, but would not preclude development if such actions can be properly mitigated. The area is almost entirely leased; therefore, development is probable and could impair the wilderness characteristics of naturalness, solitude, and unconfined primitive recreation.

Summary

VRM Class II designation within the checkerboard area would be difficult to manage because of a lack of BLM control on adjacent private property. Surface disturbing activities designed to be consistent with the VRM Class would maintain VRM classifications.

4.16.5 Impacts Under Alternative 4: Preferred Alternative

All impacts from resource management actions would be similar to those under Alternative 3.

Summary

Portions of the checkerboard and intermixed land ownership areas would be designated VRM Class III because of the lack of BLM control on adjacent private property. Surface disturbing activities designed to be consistent with the VRM Class would maintain VRM classifications.

This alternative would solve some VRM conflicts associated with the checkerboard and isolated BLM parcels within VRM Class II. It also creates VRM Class IV in heavily developed areas where it is appropriate.

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

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 water body, or other violations of federal or state water quality standards
- Any unmitigated loss of wetlands or wetland function, or violation of Clean Water Act Section 404 permit requirements
- Human activities degrade wetland/riparian areas such that, as a minimum physical state, PFC is not being maintained

- 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. Spatial analysis was conducted using ESRI's ArcGIS Desktop 8.x 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 in the State Water Quality Rules and Regulations and to maintain wetland/riparian areas at PFC or better.

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 water quality for surface waters, such as increases in pollutants or physical parameters (e.g., temperature) would degrade habitat used by aquatic live and would affect other beneficial 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.
- 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.
- Access roads would follow standard practices described in Appendix 26. However, properly designed roads would alter hillslope hydrology and concentrate overland flow 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.
- In most cases, the BMPs described in Appendix 13 would be implemented during planning for surface disturbing activities.
- RFDs and RFAs can be found in Appendix 33.

4.17.1 Impacts Common to All Alternatives

Management of cultural resources would have minor and short-term effects on water quality and soil resources. Management actions generally focus on the protection or preservation of cultural sites, which in turn benefit water and soil resources by limiting or excluding surface disturbing activities on or near such sites. Data recovery excavations of cultural sites (typically less than an acre) would cause local and short-term impacts, including surface disturbance and vegetation removal resulting in an increase of localized erosion. Protection measures afforded by the NHPA and required reclamation would mitigate any effects to acceptable levels.

The use of wildland fire, as a component of the ecosystem, would reduce canopy and ground cover, thereby exposing soils to wind and water erosion and increased runoff potential, and could adversely affect the soil's physical properties reducing infiltration. These impacts would affect sediment loading and downstream water quality depending on the severity of the fire and location within the watershed.

Harvesting of minor wood products would have minimal short-term effects on water quality. Harvesting methods would cause some surface disturbance, which would increase soil erosion, runoff, and sedimentation of surface waters during the short term. However, the level of impact would be minimal because the methods employed would involve selective tree removal and not the use of heavy equipment. During the long term, these actions would improve water quality by reducing the risk of large wildland fires and subsequent soil erosion. No new, permanent roads would be constructed and temporary roads would be reclaimed.

Construction of facilities, pipelines, and roads would cause localized short-term effects on watershed and soils until the disturbed areas have been reclaimed. Approximately 5,794 acres over 20 years would be disturbed from lands and realty actions. Communication site construction would disturb an average of 9 acres per year, or 180 acres over 20 years. Impacts from construction would cause localized short-term effects on water and soil until the disturbed area had been reclaimed. Impacts would include erosion, changes in local surface hydrology, decreased soil productivity from compaction, and removal of vegetative cover.

Ditch ROW would be evaluated for impacts, especially in locations with poor soils or steep topography. Even with appropriate planning, there would still be a possibility of ditches overflowing during extreme precipitation events and ditches that cross drainages modifying the local surface hydrology.

Telephone and fiber-optic cable installation would disturb an average of 36 acres per year, or about 720 acres during the planning period. Power lines would disturb 20 acres per year, or about 400 acres during the planning period. Pipeline construction would disturb an average of 329 acres per year. Approximately 95 percent of this disturbance is associated with oil or gas distribution lines. Thus, disturbance from transmission pipelines and water lines would be approximately 15.5 acres per year and a total of 311 acres during the planning period. The "split trench" method of construction would be used in most cases to install telephone and fiber optic cable and would cause localized short-term effects on water and soil until the disturbed area is reclaimed, generally within a year. Impacts from surface disturbance would include short-term erosion, long-term changes in local surface hydrology, decreased soil productivity from compaction, and removal of vegetative cover. Two track roads would be used or constructed to access power lines and pipeline compressor stations, and impacts would be the same as the assumption for analysis for roads. Utility corridors crossing perennial water features or wetland/riparian areas would be evaluated for individual impacts and mitigated to reduce effects to surface water features.

Non-oil and gas related road construction would disturb 42 acres for the 7 miles of road construction or improvement planned per year, or about 140 miles during the planning period. Impacts from road

construction would include short-term erosion and long-term, but localized, changes in surface hydrology and decreased soil productivity from compaction and removal of vegetative cover.

Livestock management actions would include the implementation of the Standards for Healthy Rangelands (BLM 1997), which requires the evaluation of grazing practices on a watershed scale and includes the evaluation of impacts to water resources. Livestock grazing would reduce vegetation cover and cause surface disturbance though hoof action and compact soils in localized areas. These impacts would result in increased sediment and salt loads, increased surface runoff, and less storage and retention of waters in wetland areas. Use of uplands by livestock reduces vegetation and might indirectly affect water quality, especially in areas with highly erosive soils. Livestock grazing would have localized impacts on water quality, watershed, and soil resources. Implementation of livestock management to achieve Standards for Healthy Rangelands (BLM 1997) would minimize impacts on water quality, watershed and soil resources.

Range improvements would be designed to improve range health conditions by increasing livestock distribution. These developments and improvements serve to distribute livestock within the allotment and prevent livestock concentration and overgrazing of specific areas increasing soil erosion and sediment loading. In the long term, these improvements would reduce accelerated soil erosion and enhance water quality by making wetland/riparian areas less prone to erosion and protecting streamside vegetation. The immediate area around range improvements would be subjected to erosion resulting from construction and livestock concentration around water developments and along fence lines. Range improvements would be designed with full consideration of water resources. With proper planning and effective management of range improvements, any impacts on water resources would be minimized to acceptable levels.

No coal mining is anticipated. Reclamation would occur on a small area in Hanna Basin. Roughly 5 acres per year would be reclaimed. These reclamation activities would improve local watershed and soil conditions by stabilizing soil, improving local surface hydrology, and reducing the potential for erosion.

Construction of well pads, proper disposal practices, proper casing and cementing, and reclamation of drilling reserve pits in accordance with BLM guidelines would minimize soil erosion, sediment loading, and potential groundwater contamination from drilling operations (Appendixes 1, 13, and 27).

Hydrologic investigations would be conducted before extensive CBNG development to determine whether any connection exists between surface waters and the coalbed that would be dewatered. Hydrologic investigations would include an evaluation of potential impacts to other groundwater resources, such as shallow aquifers that would be used for drinking water supplies or stock watering. These investigations would result in modification of monitoring requirements and long-term modeling of the various aquifers. Documented impacts on the various aquifers would result in management actions such as modification of pumping rates, changes in disposal options, or compensation programs for loss of water wells.

Construction of oil and gas pipelines would result in a short-term disturbance of about 18,700 acres. The net disturbed acreage is estimated to be 2,000 at the end of 20 years, considering that reclamation is achieved within 3 years. Pipeline construction and installation would cause localized short-term effects on water and soil resources until the disturbed area is reclaimed. Impacts would include short-term erosion during construction, changes in local surface hydrology, decreased soil productivity from compaction, and removal of vegetative cover. Pipeline corridors that cross surface water features or wetland/riparian areas would be evaluated for individual impacts and would be mitigated to reduce effects to surface water features. If new roads were needed to access the area, impacts from road construction would include short-term erosion and long-term changes in surface hydrology.

Locatable minerals exploration and development involve the use of vehicles and heavy equipment, which would cause compaction and physical disturbance of soils and removal of vegetation, leading to changes in local surface hydrology. Site-specific mitigation requirements and reclamation of these areas would reduce the long-term impacts on water, such as increased erosion, sedimentation in streams and rivers, channelization, and ponding of surface runoff.

Construction and maintenance of access routes and roads, especially near wetland/riparian areas would have long-term effects. Increased erosion, sedimentation, and bank instability would occur from compaction, removal of vegetative cover, and channelization of surface runoff in ruts and road ditches. In addition, road-surfacing chemicals would possibly contaminate nearby streams and water sources. Road design, including proper drainage design and culvert sizing, would lessen identified long-term impacts from road construction and maintenance; however changes in surface hydrology are likely to cause impacts such as increased erosion and sedimentation to streams and rivers. If a road design results in significant impacts to water quality and watershed health, the design would be evaluated to determine if changes in routes or design would mitigate impacts (Appendix 26).

Recreation and OHV use would result in localized soil compaction, vegetation removal, and stream bank instability, thereby increasing erosion and sedimentation loads to streams and rivers. Recreational activities and OHV use during periods of high soil moisture conditions would accelerate localized erosion and result in vegetation damage in some areas.

Paleontological resource excavations would cause local and short-term impacts, including surface disturbance, soil compaction, and vegetation removal.

The management actions for SMA would generally maintain or improve water and soil resources. Protections aimed at conserving vegetation, and limitations on surface disturbing and other disruptive activities, would maintain soil productivity and minimize erosion and sediment loading.

Vegetation management actions aimed at protecting vegetation would maintain soil productivity and minimize erosion by slowing and filtering overland flow while reducing erosive forces. Improving and diversifying vegetation has an indirect benefit of improving watershed health by reducing peak flows, hilslope and channel erosion, and sediment loading.

VRM classifications restrict visual intrusions, such as surface disturbance, which would indirectly help to maintain vegetative cover and soil productivity and minimize erosion, soil compaction, and sediment loading.

The water quality, watershed, and soils management actions would maintain or improve water and soil resources. Specifically, actions aimed at improving water bodies listed on the State's 303d list (e.g., changes in grazing management and limitations on surface disturbing activities) would maintain vegetation and minimize erosion. These activities would have the indirect benefit of improving watershed health by reducing peak flows, hillslope and channel erosion, and sediment loading.

Concentrations of wild horses in the immediate area surrounding water within HMAs would decrease vegetation cover and increase erosion. However, these effects would be minimal and highly localized. Further, the implementation of Standards for Healthy Rangelands (BLM 1997) would help ensure proper management of wild horses and serve to minimize effects on watershed and soil resources.

Wildlife and fish habitat management actions maintain and enhance wetland/riparian areas, improve vegetative cover, and reduce surface disturbance. 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 activities would have the indirect benefit of improving watershed health by reducing peak flows, hillslope and channel erosion, and sediment loading.

4.17.2 Impacts Under Alternative 1: Continuation of Existing Management

The protection or preservation of cultural sites benefits water and soil resources by limiting or excluding surface disturbing activities on or near such sites. The area within one-quarter mile or the visual horizon, whichever is closer, of the cultural resources if the historic setting contributes to NRHP eligibility would be an avoidance area for surface disturbing activities. These avoidance areas would reduce activities that cause surface disturbance. It is likely that these avoidance areas would change the individual locations and not the number of acres of surface disturbance.

Approximately 84,000 acres over 20 years would be disturbed by fire management actions. Managing wildland fires with AMR would allow wildland fire to function in its natural ecological role as much as possible. Suppression impacts would also be limited, and fire lines would be rehabilitated with water bars and seeded as necessary to reduce impacts.

Managing forests and woodlands using natural processes, prescribed fire, chemical, mechanical, and biological treatments would reduce canopy cover and increase erosion in the short term. A total of 25,900 acres would be available for harvest of commercial wood product under this alternative. As roads are upgraded to provide access to commercial products, impacts would include changes in surface hydrology and increased erosion in some areas. Included in this acreage would be 6,700 acres of sensitive areas including steep slopes and riparian areas. Intensive mitigation of timber harvest would be required, but in the short term these actions would increase erosion and change surface hydrology.

Managing forests and woodlands using natural processes, prescribed fire, and chemical, mechanical, and biological treatments would reduce canopy cover and increase erosion in the short term. Although the remaining understory would continue to protect the surface from rain splash, clear-cut treatments would have localized impacts to adjacent drainages. During the long term, soil erosion would be reduced from forest management actions that effectively improve the health and vigor of the forest and thereby reduce the chance of widespread loss of trees through insects, disease, and wildland fire. Although, the potential for short-term acceleration of erosion above acceptable levels would be high in areas of intense forest product management, proper timber harvest techniques would minimize these effects.

A total of 25,900 acres would be available for harvest of commercial wood product. As roads are upgraded to provide access to commercial products, impacts would include changes in surface hydrology and increased erosion in some areas. Included in this acreage would be 6,700 acres of sensitive areas including steep slopes and riparian areas. Intensive mitigation of timber harvest would be required, but in the short term these actions would increase erosion and change surface hydrology. Mitigation measures would reduce long-term impacts; however, because of the sensitive nature of these areas, there would still be increased sediment and surface runoff in downstream waterbodies as a result of timber harvesting activities.

Wind energy facilities, utility facilities, transportation systems, and communication sites would not be placed in certain areas. These areas are slopes greater than 25 percent, identified 100-year flood plains, and areas that are 500 feet from perennial surface 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 would 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.

Under this alternative, an estimated 45 acres per year of surface disturbance would occur as a result of range improvement projects. Range improvements would be designed to maintain or improve desired range conditions. Range improvements should serve to distribute livestock within the allotment and prevent livestock concentration and overuse of forage that lead to increased soil erosion. Planned range improvements would be designed with full consideration of water resources. Grazing systems and range improvements would be designed to achieve the management goals for livestock grazing and would serve as the primary means of improving or maintaining desired range condition, which would minimize impacts to water resources. In the short term, the immediate area surrounding range improvements would generally be subjected to erosion resulting from construction disturbances and livestock concentrations around water developments and along fence lines. With proper planning and effective management of range improvements, any impacts on water resources would be minimized to acceptable levels.

Range improvements projects include 10 reservoir or pit developments per year, totaling 200 over 20 years. Because water rights in the Platte River Basin (Map 3-11) make new reservoirs or pit impractical in this basin, the majority of these projects would be built in the Colorado River or the great Divide Basin. Depending on the number of these projects that are instream structures and the capacities of individual projects, impacts on the natural hydrology in drainages in which they are located would occur. Before the project is approved or built, these impacts would be evaluated with regard to fish populations, wetland areas and other important downstream resources. Salinity can 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.

Oil and gas management actions would result in approximately 61,895 acres of short-term surface disturbance and 16,538 acres of long-term surface disturbance. Reclamation procedures would reduce the long-term impacts on water and soil resources, such as increased erosion and channelization of surface runoff caused by pad construction and other short-term disturbance (Appendix 15). Long-term disturbance, including some roads that would be left in place after development, would have long-term impacts on surface hydrology. Impacts of this disturbance would be significant in some locations under this alternative.

Closing approximately 8,105 acres 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.

Recreation activities and OHV use on existing roads and vehicle routes would result in localized soil compaction, vegetation removal, and bank instability, thereby increasing erosion and sedimentation loads to streams and rivers. Recreation activities and OHV use during periods of high soil moisture conditions would accelerate localized erosion and result in vegetation damage in some areas. Recreation activities and OHV use to retrieve wildlife kills and access campsites would be allowed, further contributing to vegetation damage and localized erosion from pioneered roads and vehicle routes. Use of the North Platte River by boaters could increase levels of bacteria or other pollutants to surface waters, though these impacts would be minimal.

Impacts from SMA designations would usually be minimal and vary by management restrictions. The prohibition on surface disturbing activities within WSAs would maintain water quality, watershed, and soils resources in these areas. Encampment River was identified as the only Potential WSR, the one-quarter mile buffer as part of the designation will afford some protection to this river, by precluding new water developments and limiting surface disturbance.

Increased access and vehicular use within the RMPPA as a result of acquiring new easements would increase the potential for vegetation removal and accelerated soil erosion. Impacts would be greatest if these newly acquired easements remained as two-track roads. Upgrading roadways would require installation of erosion control structures, which would mitigate soil erosion and reduce impacts.

Vegetation management actions—including the maintenance, improvement, and restoration of wetland/riparian areas to enhance forage conditions and provide wildlife habitat—and weed control would improve water quality, watershed, and soil resources. 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, about 2,500 acres per year or 50,000 acres over 20 years, would have short-term impacts 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. These projects would include an evaluation of water resource impacts and would be weighed with the potential for long-term beneficial impacts. Mitigations, such as timing, and location of the treatments would minimize these impacts.

Burning within prescription areas would generally have a long-term positive effect on water quality and watershed health and are designed to reduce fuel loading and decreased risk of wildland fire. In localized areas, there some erosion would occur as a result of loss of canopy cover and changes to water quality in the first 2 years following the fire. The significance of impact caused by prescribed fire would depend on the soil type, amount of area burned, intensity and severity of fire, and rate of revegetation.

Surface discharge of produced water is regulated by the State of Wyoming through NPDES permits and has been authorized in the North Platte, Great Divide, and Colorado River Basins. Produced water from natural gas reservoirs located in coal formations can result in high volumes of water as compared with conventional natural gas. Produced water quality from coal formations within the RMPPA have ranged from 400 milligrams per liter (mg/L) of total dissolved solids (TDS) to 3,000 mg/L. Although unusual, produced water from coal seams can be more than 10,000 mg/L TDS. However, produced water with salinity levels this high would not be considered for surface discharge and would most likely be injected as a result of state water quality standards. Produced water disposal options are highly dependent on water quality and economics (BLM 2003b).

Where it occurs, the surface discharge of produced water during natural gas or oil extraction would change the physical hydrology of ephemeral drainages in some areas and would create additional temporary water sources or evaporation/percolation pits that would need reclamation. Water management plans for surface discharges would address reclamation strategies, would require monitoring to address changes in ephemeral channels, and should minimize impacts to watershed health. NPDES permits would be required by the State of Wyoming and regulate water quality changes beyond the designated beneficial uses of surface waters. Produced water discharges would change water quality in some areas.

Avoiding surface disturbing activities in identified 100-year flood plains, areas within 500 feet from perennial waters, springs, wells, and wetland/riparian areas, and areas 100 feet from the inner gorge of ephemeral channels would stabilize stream banks, reduce erosion and sediment loads, promote vegetative cover, and enhance water quality.

Management actions designed to maintain and improve water quality and watershed health would indirectly enhance soil resources. Designation of avoidance areas near water sources, protections of

wetland/riparian areas, and specific limitations on surface disturbing activities would all help maintain vegetative cover, reduce runoff and erosion, and enhance soil productivity.

Wildlife and fish habitat management actions maintain and enhance wetland/riparian areas, improve vegetative cover, and reduce surface disturbance. 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.

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 1, 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 water bodies. This is most likely to occur in the Colorado River Basin or in the North Platte above Seminoe Reservoir as a result of minerals development and of surface discharge of produced water combined with surface disturbing activities. Overall, these impacts from surface discharge of produced water and surface disturbing activities would result in significant impacts to water quality and watersheds.

Soil disturbing activities would result in significant impacts to soils under this alternative. Localized disturbance and a regional increase in development would result in soil loss above natural levels, which would exceed 2 tons per acre.

4.17.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts resulting from cultural resource management, lands and realty management, OHV management, recreation management, transportation and access management, water quality, watershed, and soils management, and fish and wildlife management would be the same as those found in Alternative 1 (Section 4.17.2).

Fire and fuels management would emphasize suppression resulting in fewer acres impacted by wildland fire during the planning period. Greater suppression efforts would result in increased impacts from such activities including the use of heavy machinery, which would create short-term preferential flow paths and localized erosion. About 60,000 acres over 20 years would be disturbed by fire management actions. This alternative would result in an accumulation of fuels and increase the likelihood of high-intensity watershed-damaging wildland fires, which would reduce canopy and ground cover, thereby exposing soils to wind and water erosion and increased runoff potential, and could adversely affect the soil's physical properties reducing infiltration. These impacts would affect sediment loading and downstream water quality depending on the severity of the fire and location within the watershed.

Impacts resulting from forest management would be the same as those of Alternative 1, except increased commercial timber harvest activities under this alternative would increase the potential for erosion damage and sediment runoff due to the removal of more vegetative cover from forest and woodland areas during the short term.

Grazing systems and range improvements would be implemented to maximize livestock production (such as increased weight gain of cattle, improving distribution, and increasing water developments). Range improvement projects would focus on water developments and would increase the number of reservoir,

pits, wells and pipelines constructed annually. An additional 5 pits or reservoirs (50-percent increase) per year would be constructed under this alternative, leading to 300 pits or reservoirs over 20 years. The increase in water developments serve to distribute livestock within the allotment and prevent livestock concentration and overuse of forage that leads to increased soil erosion and salt and sediment loading. 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 concentration around water developments.

Oil and gas management actions would result in approximately 63,649 acres of short-term surface disturbance and 17,013 acres of long-term surface disturbance. Reclamation procedures would reduce the long-term impacts on water and soil resources, such as increased erosion and channelization of surface runoff (Appendixes 1, 13, and 15); however, these impacts would be significant in localized areas and initially after disturbance.

Approximately 8,825 acres would be closed 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 minimal because historic and projected production from locatable minerals is negligible within the RMPPA.

Impacts resulting from SMA management would be the same as those in Alternative 1, except there would be greater opportunity for impacts from surface disturbance activities as a result of less restrictive management for many of the existing and proposed SMAs.

Impacts from the proposed Rawlins OHV SRMA would include soil compaction and removal of vegetation. However, impacts from the proposed Rawlins OHV SRMA to water quality and watersheds would be negligible because the proposed SRMA is located in a basin. The SRMA would be bermed to prevent erosion from occurring outside the area and contain sediment loading. The recreation area would still contribute windborn sediment to the adjacent Hogback Lake. If the berm is breached or recreational users go outside the designated area, impacts on water quality and hydrologic function would occur in Hogback Lake.

Vegetation management would use vegetation treatments such as chemical, mechanical, or prescribed fire for the benefit of commodity production. Vegetation treatments would occur on about 24,400 acres per year or 488,000 acres over 20 years. These treatments would result in more homogenous disturbance and therefore would be more susceptible to windborne erosion and surface runoff events in the short term. In the long term, such actions would result in more vegetation cover and reduced erosion rates.

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 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 water bodies. This potential is more likely under Alternative 2 when compared with the other alternatives. This is most likely to occur in the Colorado River Basin or in the North Platte above Seminoe Reservoir because of minerals development and as a result of surface discharge of produced water combined with surface disturbing activities.

Soil disturbing activities would result in significant impacts to soils under this alternative. Localized disturbance and a regional increase in development would result in soil loss above natural levels, which would exceed 2 tons per acre.

4.17.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts resulting from recreation management and wildlife management would be the same as those found in Alternative 1.

Impacts from the management of cultural resources would be similar to those described under Alternative 1, except the areas identified would not allow surface disturbance one-quarter mile or the visual horizon, whichever is closer, of the cultural resources if the historic setting contributes to NRPH eligibility. Because the mitigation measures are very restrictive, 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 would emphasize natural processes resulting in more acres impacted by wildland fire during the planning period. Approximately 212,000 acres over 20 years would be disturbed by fire management actions. This alternative would result in less accumulation of fuels than under Alternatives 1 and decrease the likelihood of high intensity watershed-damaging wildland fires.

There would be no commercial timber harvest. Management actions on 25,900 acres of commercial forestlands would be allowed to enhance forest health and meet public demand for minor wood products, which would minimize the need to improve existing roads and impacts from road construction on water quality and watersheds. Impacts from such improvements would be less than those described for Alternatives 1.

Areas such as slopes greater than 25 percent, identified 100-year flood plains, 500 feet from perennial surface water, wells, springs, wetland/riparian areas, and ephemeral channels (Table 2-5) would be avoided where possible for the placement of wind energy facilities and closed to placement of utility facilities, transportation systems, and communication sites. This management action would prevent impacts from construction of facilities in these areas such as erosion, sediment loading, and runoff, and surface hydrology changes. 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 resulting from livestock management 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. Impacts for reservoir and pit range improvements would be the same as those described for Alternative 1. Range improvement projects would include an increase in fence conversion and no pipeline construction for livestock water; this would result in more concentrated livestock distribution in specific areas increasing impacts to specific watersheds.

Oil and gas management actions 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. Reclamation procedures would reduce the long-term

impacts on water and soil resources, such as increased erosion and channelization of surface runoff (Appendices 1, 13, and 15).

Approximately 402,280 acres would be closed 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 minimal because historic and projected production from locatable minerals is negligible within the RMPPA.

Impacts resulting from OHV management would be similar to those of Alternative 1, except OHV use would be restricted to designated roads and vehicle routes to access campsites or retrieve wildlife kills. This would most likely result in fewer pioneered roads and vehicle routes, thereby reducing localized erosion.

Impacts resulting from SMA management 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 SMAs. Increased protection of water and soil resources would result from restrictions placed on surface disturbing activities as compared with other alternatives because a greater amount of land area would be subject to NSO requirements, closed to oil and gas development, closed locatable mineral entry, and limited OHV use. Management actions that limit the extent of surface disturbing activities would help minimize impacts such as erosion, sediment loading to waterways, compaction of soils, loss of soil productivity and reduction of vegetation.

The boundaries of the Encampment River Potential WSR would extend to the visual horizon above the river; however, the average buffer would be less than one-quarter mile. This would provide some additional protection for water quality and watershed health, particularly if Congress releases the WSA from wilderness consideration.

Impacts resulting from transportation and access management would be similar to those of Alternative 1, except there would be additional priority areas for obtaining public access to BLM lands, which would increase the potential for vegetation removal and accelerated soil erosion.

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 of 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 windborne erosion and surface runoff events. Increased erosion would occur on the borders of prescribed fires as a result of greater line disturbance to create smaller treatment units.

Rangeland areas would be managed to achieve DPC, which would improve soil productivity, reduce potential erosion, improve vegetative cover, and enhance watershed health.

Produced water would be injected in the Colorado River Basin, and there would be fewer oil and gas wells. Produced water in the North Platte and Great Divide Basins would be surface discharged if it meets 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, 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 from sources in the Muddy Creek watershed would not be allowed. This management action would maintain or enhance water quality and watershed health by preventing salts from contaminating water bodies reducing salt loading in the Colorado River System.

Eliminating surface disturbing activities in identified 100-year flood plains, areas within 500 feet of perennial waters and wetland/riparian areas, and areas 100 feet from the inner gorge of ephemeral channels would stabilize stream banks, reduce erosion and sediment loads, promote vegetation cover, and enhance water quality. This management action would reduce erosion and sediment loads in these sensitive areas.

In the Muddy Creek watershed (USGS HUC 14050004), no management actions would be approved that lead to more than 1 acre-foot per year of depletion of water to the Colorado River system per project. 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).

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).

Road crossings and drainages that potentially support fish for a portion of the year would be designed to simulate natural stream processes. These stream channel crossings would be sized to pass a 100-year storm event. This would allow the stream to naturally adjust to amount of water and sediment provided by the watershed, even during extreme storm events. Allowing for these unimpeded processes would most likely result in sediment deposition in flood plains and improvements in channel structure that would improve water quality and riparian function in the long term.

Impoundments and instream structures would not be permitted 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 maintain current flow and sediment transport conditions.

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 water bodies. 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 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 under this alternative. Localized disturbance and regional areas with increased development would result in soil loss above natural levels, which would exceed 2 tons per acre.

Under Alternative 3, oil and gas activities would be minimized and would result in fewer impacts to water and soil resources areas than under Alternatives 1. Therefore, Alternative 3 would result in moderate impacts for the significance criteria regarding water and soil resources.

4.17.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from fire and fuels management, recreation management, transportation, and access management would be the same as those of Alternative 1.

Impacts resulting from cultural resource management would be the same as those of Alternative 3.

Managing wildland fires with AMR would allow wildland fire to function in its natural ecological role as much as possible. Fire suppression activities would be limited; therefore, impacts from such activities would be less than other alternatives. Fire lines would be rehabilitated with water bars and seeded as necessary to further reduce soil erosion.

Impacts from forest management would be the same as Alternative 1, except a total of 19,200 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 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.

Wind energy facilities, utility facilities, transportation systems, and communication sites would not be placed in certain areas. Areas are slopes greater than 25 percent, identified 100-year flood plains, and areas that are 500 feet from perennial surface 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 resulting from livestock management would be similar to those of Alternative 1, except emphasis would be placed on achieving DPC. Actions to achieve DPC would reduce erosion and sediment loading to nearby streams, improve vegetative cover, and enhance soil productivity. Construction of range improvements would disturb about 920 acres over 20 years. Range improvement projects would include an increase in fence conversion and pipeline construction for livestock water; this would result in greater livestock distribution in specific areas increasing impacts to specific watersheds.

Oil and gas management actions would result in approximately 57,819 acres of surface disturbance during the planning period. The majority of this disturbance would be reclaimed, resulting in a total long-term disturbance of 15,472 acres. Reclamation procedures would reduce the long-term impacts on water and soil resources, such as increased erosion and channelization of surface runoff.

Impacts resulting from locatable mineral management would be less than those of Alternative 1. Approximately 28,724 acres would be closed 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 minimal because historic and projected production from locatable minerals is negligible within the RMPPA.

OHV use on existing roads and vehicle routes 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 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 less pioneered roads and vehicle routes and less localized disturbance.

Impacts resulting from SMA management 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 SMAs. 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 impacts such as erosion, sediment loading to waterways, compaction of soils, loss of soil productivity, and reduction of vegetation.

Vegetation treatments, such as mechanical, biological, chemical, and prescribed fire, would be applied to meet Standards for Healthy Rangelands (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 windborne erosion and surface runoff events 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.

Surface discharge of produced water would not be allowed in the Colorado River Basin, and there would be fewer oil and gas wells that require the disposal of produced water. Surface discharge of produced water in the North Platte and Great Divide Basins would be allowed if it meets state water quality standards. These actions would maintain water quality in these basins.

Any activities that result in salt loading to the Colorado River system from sources in the Muddy Creek watershed would be intensively managed, which would reduce salt loading in the Colorado River system. Activities that result in salt loading include surface disposal of produced water from oil and gas activities, impoundment of water, and surface disturbing activities.

Avoiding surface disturbing activities in identified 100-year flood plains, areas within 500 feet from perennial waters, springs, wells, and wetland/riparian areas, and areas 100 feet from the inner gorge of ephemeral channels would stabilize stream banks, reduce erosion and sediment loads, promote vegetative cover, and enhance water quality.

Actions that would cause new water depletions within the Colorado River system would comply with the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. This action would maintain flow conditions in the Colorado River system needed for the recovery program administered by the U.S. Fish and Wildlife Service (USFWS).

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 the towns in the Upper North Platte River valley (Map 2-20).

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. These actions would affect natural water resources by lessening surface disturbance and reducing the potential for soil erosion and sediment loading.

Road crossings and drainages that potentially support fish for a portion of the year would be designed to simulate natural stream processes. This would allow the stream to naturally adjust to the amount of water and sediment provided by the watershed, even during extreme storm events. Allowing for these unimpeded processes would most likely result in sediment deposition in flood plains 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 location degrade water quality beyond the designated use of receiving water bodies. 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.

Management actions would emphasize achieving DPC, which would provide more protection to water and soil resources than Alternative 1. Therefore, Alternative 4 would result in minor impacts for the significance criteria regarding wetland/riparian areas and could result in long-term beneficial impacts.

Soil disturbing activities would result in significant impacts to soils under this alternative. Localized disturbance and regional areas with increased development would result in soil loss above natural levels, which would exceed 2 tons per acre.

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 Appropriate Management Level (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 20 percent annually.
- Wild horse removals (gathers) would occur about every 3 to 4 years.
- 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

Cultural resource management activities, such as inventory, excavation, and monitoring, would create negligible short-term localized direct 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 very small relative to the size of HMAs.

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 or fenced, where necessary, until the vegetation recovers.

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.

There would be no impacts from the sale or disposal of public lands to wild horses. No lands would be identified for disposal within existing HMAs.

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 the development and maintenance actions and use of new roads. There would be no long-term loss in forage because effects of utility and transportation development would be revegetated.

Extensive development of utility and transportation systems outside existing developments would affect the wild and free-roaming nature of wild horses. Locating new utility and transportation systems next to existing facilities whenever possible would reduce the potential to fragment of wild horse habitat.

Impacts to wild horses from livestock grazing management would be indirect and would occur across each HMA. Because adjustments to grazing use occur after monitoring indicates 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. Monitoring of grazing use by all grazing animals would ensure that there would be no long-term impacts to wild horses. Wild horses might be excluded from riparian habitat to meet Standards for Healthy Rangelands (BLM 1997), which would limit some water and forage availability.

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. This would reduce the available forage for livestock, wildlife, and wild horses, and increase competition for remaining forage. This effect would be short term and would coincide with the displacement of and stress to wild horses from human activity.

Implementation of paleontology 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 very 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, and camping.

The management of four SMAs 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 Trai—transect the Stewart Creek HMA. Two other SMAs—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 SMAs would be negligible and restricted to the SMA and to areas directly adjacent to the historic trails. Restrictions on development in the SMAs preclude, restrict, or require mitigation for surface disturbing activities.

The recreational opportunities provided by historic trails and the Continental Divide National Scenic Trail 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.

Management actions designed to enhance vegetative conditions would increase vegetative diversity and forage production. 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, could impact the wild and free-roaming character of the wild horses and could 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 VRM would be minimal. Available forage for wild horses would not be impacted by development and associated surface disturbance because the VRM Class I designation of the Adobe Town WSA precludes development.

Impacts to wild horses from water quality, watershed, and soils management would be minimal during the long term. Management actions aimed at reducing erosion in watersheds and improving water quality would provide long-term impacts to wild horses by enhancing habitat and increasing forage production. Riparian management actions ensure that forage and water remain available for wild horses in the HMAs.

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 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 (BLM 2001b). Although meta-populations surrounding the Lost Creek HMA would exceed this number, the AML in the Lost Creek HMA is not high enough to maintain genetic viability in isolation. As noted in Chapter 3, movement between meta-populations is fairly common.

There is potential that competition for resources between wild horses and big-game species would occur. However, because there is a limited amount of crucial wildlife range within the HMAs, this impact would be 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 in an HMA.

4.18.2 Impacts Under Alternative 1: Continuation of Existing Management

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.

In addition to impacts from fire and fuels management common to all alternatives, use of wildland fire for resource benefit would increase the size of theses fires. These areas would decrease short-term forage availability; however, forage availability and diversity would be increased over the long term. Management problems arising following wildland fires would increase, making wild horse management more difficult for a period.

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).

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.

Livestock grazing management would result in the maintenance and improvement of the range condition, as directed by Standards for Healthy Rangelands (BLM 1997). Range improvements, such as stock ponds and vegetative treatments, would cause long-term impacts by increasing the availability of water and forage.

Long-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.

Under this alternative, the Lost Creek AML would be 70. Genetic viability of wild horses in all HMAs would be maintained; however, the New World Iberian genotype associated to horses from the Lost Creek HMA would not be guaranteed.

Seasonal wildlife stipulations and avoidance areas (see Table 2-10) would preclude, restrict, or require mitigation for surface disturbing activities. This would impact wild horses by maintaining available forage, and reducing human disturbance, 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.

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 the productivity of the range. 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.

Genetic viability of wild horses in all HMAs would be maintained, however, the New World Iberian genotype associated to horses from the Lost Creek HMA would not be guaranteed.

4.18.3 Impacts Under Alternative 2: Emphasis on Development of Resources

Impacts from cultural resource management, forest management, and OHV 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 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. However, weed infestations that are left untreated would continue to reduce available forage for wild horses, but would be less likely under this alternative.

Impacts to wild horses from minerals management would be the same as under Alternative 1, except there would be fewer stipulations from other resource values, such as cultural resources, Special Status Species habitat, big-game winter range, 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 a greater loss of wild, free-roaming nature of wild horses.

Impacts from wildlife management are the same as Alternative 1.

Summary

Increased mineral development and a reduction in SMAs 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 New World Iberian genotype associated to horses from the Lost Creek HMA would not be guaranteed.

4.18.4 Impacts Under Alternative 3: Emphasis on Protection of Resources

Impacts from cultural resource, livestock grazing, SMAs, and wildlife management would be the similar as those of Alternative 1.

Impacts from fire and fuels management would be similar to those under Alternative 1, except wildland fire for resource benefit would be used 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.

Impacts resulting from OHV management would be the same as those in Alternative 1, except wild horses in the Adobe Town WSA would not be impacted by OHV use, either through vegetation loss or temporary displacement. 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 treatment of noxious and invasive weeds would be similar to Alternative 2.

Under this alternative, the population would be allowed to increase to an AML of 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 (BLM 2001b). Ensuring the viability of horses within the Lost Creek HMA would also preserve the genetically significant New World Iberian genotype and associated phenotype.

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.

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 genetically significant New World Iberian genotype and associated phenotype.

4.18.5 Impacts Under Alternative 4: Preferred Alternative

Impacts from cultural resources, forest, SMA, and wildlife management on wild horses would be the same as those identified in Alternative 1.

Impacts from fire and fuels management would be similar to those under Alternative 1, except the number of fuel treatments would increase four to eight times resulting in an overall shift in plant communities to more early and mid-seral conditions in treated areas.

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.

Management of wildlife habitat for DPC within an HMA would provide improved forage to meet the AML.

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.

Genetic viability of wild horses in all HMAs would be maintained, however, the New World Iberian genotype associated to horses from the Lost Creek HMA would not be guaranteed.

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 habitat function or disruption of life history requirements of a species or population segment that would make them eligible for listing under the Endangered Species Act (ESA).
- Decreased viability or increased mortality of threatened and endangered (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 threatened and endangered 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

Cultural Resource Management

Authorized excavation of cultural sites and cultural inventories 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. 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.

Any proposed wildlife habitat enhancement project would require a cultural clearance before beginning the project. If cultural sites are found at proposed locations of wildlife habitat enhancement projects, projects would have to be reevaluated, site adjustments would have to be made, and the projects might have to be redesigned.

Fire and Fuels Management

Wildland fire suppression activities and fuel reduction (WUI) projects would be conducted according to the appropriate fire management requirements. Wildland fire could be beneficial and 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 could negatively affect species adapted to late-seral forest types.

The use of wildland fire as a component of the ecosystem would promote the return of fire to its natural role of maintaining habitat for a diversity of wildlife. Wildland fires usually occur in summer and early fall when conditions for fire are optimum as a result of the combination of low humidity and higher temperatures. Over the past several decades, human intervention in fire suppression has led to increased fuel loading that might allow wildland fires to burn with greater intensity resulting in greater consumption of vegetation. Fire-sensitive vegetation like bitterbrush, which is an important browse species for big game, are often killed and their composition within the plant community reduced. On rare occasions, these fires have the potential to burn exceptionally hot, resulting in sterilization of soils. Sterilization of the soils could delay revegetation for many years depending on the severity of the fire. This delay could result in the long-term loss of wildlife habitat.

Periodic random wildland fires would rejuvenate overmature, decadent shrub communities and would remove vegetation, forage, hiding cover, and thermal cover. Historically, less intense fires that did not affect entire wildlife populations created mosaics resulting in more variability in vegetation seral stage, species composition, vertical stratification, and improved herbaceous understory. This would benefit species that prefer open habitats, such as mountain plover, mountain bluebirds, and species that benefit from increases in fire-responding vegetation, such as sharp-tailed grouse.

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, these species would normally recolonize burned areas fairly quickly. For example, amphibians are not as mobile as other animal orders. If wildland fires occurred in areas of important amphibian populations there would be 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 wildfire would allow habitats to be recolonized from neighboring populations.

The importance of landscape scale disturbances resulting from wildland fire, to aquatic and riparian ecosystems, has recently received additional attention (Bisson et al. 2003). Natural disturbance regimes maintain the diversity of riparian ecosystems, resulting in a healthier habitat (Naiman et al. 1993). An example of this affect would be the response of desirable riparian vegetation such as willow in areas exhibiting encroachment by upland species to occasional fire. However, these disturbances can also include fire-related flooding, debris flows, landslides and increased siltation, all of which would affect the riparian ecosystem (Dwire and Kauffman, in press). Additional changes to riparian ecosystems can result from the response of vegetation to fires outside the riparian zone. A key example of this influence is the regeneration of quaking 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.

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.

Fire suppression activities occurring in fish and amphibian habitats would potentially harm populations of these species as a result of the application of toxic fire-fighting chemicals in riparian/wetland areas. In addition, roads or other surface disturbance associated with fire suppression activities might increase sedimentation rates into riparian/wetland habitats.

Forest Resource Management

Impacts resulting from forest management activities and its associated infrastructure would include direct habitat loss or decreased suitability and disturbance of wildlife from increased noise and traffic. For example, wildlife, specifically big game species, avoids areas adjacent to access roads and timber harvest areas because of the associated increase in activity. Forest management practices, which convert late-seral stage stands to early and mid-seral, would negatively affect species adapted to late-seral forest types. Forest management practices would create a diversity of seral stages for different wildlife species habitat requirements, thereby increasing species diversity and richness. The harvesting of wood products, such as poles, firewood, and wildings (local term for small shrubs and brush) is minimal at present, and it is expected to remain at the current level and would have a minimal effect on wildlife resources.

Roads created for commercial timber harvesting would be closed and rehabilitated as soon as possible after the end of timber harvesting. Closing and rehabilitating roads has benefits to big game by eliminating disturbance from vehicles, reestablishing vegetation for forage and cover, and eliminating the roads as erosion/sediment sources.

Short- and long-term impacts on big game habitat would be minimized if timber harvests were effectively executed. The layout and timing of timber sales would largely determine the degree of impacts to wildlife habitat. Intensive management and harvest of mature timber areas most often is naturally reseeded; regeneration of commercial forest provides habitat of varying size, age class and habitat for various species that change as the forest matures. This natural succession happens over an 80- to 100-year period. Potential short-term impacts include loss of security and calving cover and displacement of elk to other portions of the habitat. Long-term impacts to security cover in the areas would also be caused by timber harvest.

Upgrade of existing access roads for logging operations would temporarily affect aquatic habitats by concentrating streamflow, increasing erosion rates, and fragmenting habitats. Removal of forest vegetative cover would alter aquatic habitats by changing the time of peak discharge following precipitation events and increasing sediment transport from upland sources to the stream channel until revegetation has occurred.

Logging within or near riparian zones can result in more severe erosion and greater danger of reducing the water quality of the associated aquatic zone, which can in turn alter the suitability of aquatic habitats for aquatic species including fish, macroinvertebrates, and amphibians.

Lands and Realty Management

Impacts to wildlife and fish management from lands and realty management would be moderate. 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) would occur. These activities primarily

affect big sagebrush, short grass, saltbush steppe, and greasewood habitat types, which are all common in the RMPPA, which affect the diversity of species found in these habitat types. ROW-approved actions for power lines, communication sites, and wind turbines would also include injury and death to bats, raptors and other migratory birds as a result of collisions. Increased road density and human presence would act to increase stress levels of wildlife during sensitive time periods (e.g., breeding, migration, wintering) and increase edge effects. In addition, continual noise emissions, such as from compressor stations, located close to active leks, would interfere with the mating success of birds. For example, this would reduce the reproductive success of Greater sage-grouse by interfering with the ability of female sage-grouse to locate leks (LaGory et al. 2001; Dantzker et al. 1999).

As requests for ROW actions related to new water diversions are generated, NEPA analysis of potential adverse impacts would be required before authorizing actions that might affect the functionality of streams, riparian areas and associated fish habitats. Water diversions have had negative impacts to fisheries and fish habitat in the past. In some cases, streams have been completely dewatered for periods of time rendering the stream unusable as fish habitat and in some cases making the riparian area nonfunctional.

The crossing of riparian areas by roads can fragment fish populations by limiting the movement of aquatic species. Review of road design criteria and incorporation of fish passage needs would minimize this impact. Roads also would affect aquatic populations by creating additional flow paths, concentrating streamflow, and increasing erosion rates.

Livestock Grazing Management

Management of BLM lands to meet Standards for Healthy Rangelands (BLM 1997) would minimize impacts from livestock grazing. The impact from livestock grazing management on fish and wildlife habitat includes direct competition for forage, water, and space, indirect effects of habitat alteration, and the effect of management tools such as range improvements. Livestock grazing creates competition for grass and forb food sources for big game and avian species (e.g., sage-grouse). Livestock tend to congregate near water sources potentially compromising stream bank stability and causing erosion.

Livestock grazing practices occurring during the winter on crucial winter range would contribute, to varying degrees, to indirect impacts to wildlife when they are most vulnerable. Removal of vegetation by livestock reduces vertical structure, which provides visual security to upland nesting birds. This might lead to increased predation and lower nesting success. Overuse of desired plant species by livestock results in a change in species composition, which generally negatively affects wildlife. For example, loss of shrubs in riparian plant communities limits the use of these habitats by neotropical birds. Conversely, livestock grazing in short-grass habitats would benefit or have little effect on species such as the mountain plover. Appropriate use levels under the right environmental conditions could have beneficial impacts to wildlife habitat T&E, candidate, and proposed sensitive plant populations. Appropriate use levels of grazing might help to improve the palatability of forage for elk. Ute ladies'-tresses have been shown to respond favorably to moderate grazing intensity in riparian areas. Cattle use of sedges and grasses increases the proportion of succulent forbs found in the plant community but reduces the stability of riparian systems.

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 species habitat requirements.

Livestock improvements designed to alter grazing distribution and use of pastures, such as fences can impact wildlife. Fences would create travel barriers, cause stress and energy loss, and might cause death from entanglement to big game species. In addition, fences have altered the distribution of big game species. They create obstructions for birds to fly into and perches for predator species. The indirect benefit of fences on wildlife is the control provided to livestock management for utilizing the vegetation resource while minimizing impacts to wildlife habitat. Fences built to BLM standards would decrease impacts on big game movements by incorporating design elements that reduce injury and entanglement. When replaced or repaired, existing fences will be built to current BLM fence standards. The conversion of fences to meet BLM standards would reduce injury and entanglement rates of wildlife and decrease stress and energy loss. Fencing of riparian areas to protect water sources and riparian areas would help to maintain or improve habitat conditions supportive of fish and other aquatic species populations.

The use of water developments for the purpose of livestock management or wildlife habitat enhancement has variable affects on fish and wildlife populations. Given proper design and management of water developments, increased management flexibility afforded to livestock operations can help to decrease grazing impacts to riparian areas or other high-priority habitats.

Water developments for livestock have expanded the range of 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 in these areas longer in the spring; consequently, the quantity and quality of available forage would be decreased the following winter. These new water developments also bring livestock use into previously unused areas, which further decrease available forage.

Impoundments change the hydrologic regime of the watershed and impact fish habitats by altering water temperatures and the timing and volume of flow, minimizing the effects of flushing flows, and altering sediment transport within the system. In addition, impoundments constructed on streams containing populations of fish, invertebrates, or amphibians would limit movement among required habitats. Due to 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 sensitive native fishes. Reservoirs that exhibit habitat characteristics sufficient to support salmonid populations would increase habitats available for potential trout fisheries. Consideration of alternative water development designs such as wells and guzzlers would help to minimize the adverse impacts that impoundments can have on upstream and downstream fish populations.

The use or implementation of grazing BMPs (Appendix 15) would help to maintain or restore habitat conditions for various fishes and increase the availability of angling opportunities.

Minerals Management

Factors affecting wildlife species (especially big game) associated with minerals management actions within the RMPPA include the reduction in usable habitat and disruption of movements among crucial habitats (e.g., crucial winter range), transitional areas, and parturition areas associated with the construction of access roads, facilities, or other surface disturbances (Map 2-53–2-56). Habitat fragmentation occurs when a contiguous habitat is broken up (fragmented) by disturbing activities, causing a reduction in usable ranges and the isolation of smaller, less mobile species; a loss of genetic integrity from within species or populations; and an increase in abundance of habitat generalists that are

characteristic of disturbed environments (i.e., competitors, predators, and parasites) (Harris 1991). 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).

Within the RMPPA, approximately 357,930 acres of leased land has high potential for oil and gas and CBM that overlaps with crucial winter range. In addition, roughly 707,590 acres of leased land has moderate potential for oil and gas and CBNG development that overlaps with crucial winter range. Impacts of human activity on big game crucial winter range include direct impacts of loss of habitat and forage occurring from surface disturbing and other disruptive activities at any time of the year and indirect impacts of displacement and physiological stress occurring from human presence and activity during the winter. 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, mining, and salable minerals extraction occurring during the winter on crucial winter range all contribute, to varying degrees, to indirect impacts to wildlife when they are most vulnerable.

Initially, an estimated 7.1 acres of habitat would be lost for each well. After the well becomes a producer, the disturbance drops to 4.5 acres per well on average. However, reclamation efforts do not guarantee that habitat will return to its original function. Reclaimed areas might be more vulnerable to invasion of noxious weeds and might not provide the same habitat, forage, or cover 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 should be replaced by late successional species such as sagebrush. Therefore, these habitats would usually return to late successional plant communities supportive of species favoring these habitat types. Occasionally, drilling of multiple well bores from a single well pad would reduce impacts to wildlife by reducing the number of surface locations and surface area disturbance. In addition, some wells are dry holes or abandoned producers and these areas are reclaimed.

Impacts on surface water resources from groundwater extraction are variable, depending on the connectivity of surface water resources to the target groundwater aquifer. If a connection occurred, there would be potential to dewater both lentic and lotic systems that might be of importance to aquatic populations. Based on the depth of targeted coal formations (1,200 feet to 5,500 feet) and high pressures in most reservoirs, it is improbable that a connection to surface waters would exist.

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.

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.

The estimate for the amount of water needed to drill and complete each well is 3.2 acre-feet. These depletions would effectively decrease the usable habitat available to fish populations or decrease the suitability of available habitats by altering hydrologic conditions responsible for the creation and maintenance of instream habitat features.

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. Long-term benefits would include enhanced and more diversified vegetative cover providing for better habitat for wildlife.

Common variety mineral extraction would result in short-term and direct impacts to wildlife and associated habitat, however impacts would be minimal because disturbances are generally small.

Potential impacts of fluid mineral development on Greater sage-grouse populations include: direct habitat loss from well, road, pipeline, and transmission line construction; increased human activity and associated pumping noise causing displacement; increased legal and illegal harvest; 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) (LaGory et al. 2001; Dantzker et al. 1999).

Off-Highway Vehicle Management

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. 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. The reduction of designated road densities would decrease disturbance to wildlife and their habitat.

Over-the-snow vehicles would impact wintering wildlife by increasing displacement and stress during critical time periods. Several closures and seasonal restrictions exist to minimize this impact (SMA discussion).

Impacts of human activity on big game crucial winter range include direct impacts of loss of habitat and forage occurring from surface disturbing and other disruptive activities at any time of the year and indirect impacts of displacement and physiological stress occurring 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).

Paleontological Resource Management

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 could 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

Recreation management 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. Impacts of human activity on big game crucial winter range include direct impacts of loss of habitat and forage occurring from surface disturbing and other disruptive activities at any time of the year and indirect impacts of displacement and physiological stress occurring from human presence and activity during the winter.

Human disturbance of big game, whether it is intentional (e.g., harassment) or unintentional, 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 lower quality habitat. If the disturbance becomes chronic or continuous, these costs can result in reduced animal fitness and reproductive potential (Geist 1978).

Special Management Areas

The management actions afforded to SMAs would result in beneficial impacts to wildlife. Protections aimed at conserving vegetation, and limitations on surface disturbing and other disruptive activities, would benefit wildlife by enhancing overall habitat conditions. Developments, uses, and facilities would be managed spatially to minimize loss or alteration of wildlife habitat of higher value. Additionally, Plans of Operations are required for all development.

WSAs would benefit wildlife and fish species and associated habitat by restricting surface disturbing and other disruptive activities and preserving wilderness characteristics.

Implementation of management actions to reintroduce 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.

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 could be altered or eliminated, changing some traditional use patterns on a local level. Seclusion areas for wildlife would become smaller and more dispersed in some areas. Transportation routes could also increase public accessibility to areas that previously have been somewhat inaccessible to vehicles during the winter and spring, this would become more important and increase adverse effects to wildlife as increased demands for use of public lands occur. Existing leases within the RMPPA might not provide the specific mitigation measures needed to protect important wildlife habitats (e.g., major highway routes).

Impacts of human activity on big game crucial winter range include direct impacts of loss of habitat and forage occurring from surface disturbing and other disruptive activities at any time of the year and indirect impacts of displacement and physiological stress occurring from human presence and activity during the winter.

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; however, there would be short-term impacts on habitat and displacement of wildlife until vegetation communities reestablished themselves.

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 is the loss of habitats 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 loss of late successional vegetative communities would result in a reduction of habitats 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 community interactions.

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 the Wildland Fire and Fuels Management heading.

Visual Resource Management

In some cases, moving project locations to comply with visual resource management directives might have positive or negative impacts on wildlife and fish habitat. These impacts are expected to be negligible.

Water Quality, Watershed, and Soils Management

The management of wetland/riparian areas to improve their PFC rating would improve fish habitat conditions. Because the PFC assessment methodology does not incorporate the habitat requirements of fishes, additional management would be necessary to ensure that habitats provide conditions suitable to meet the life history requirements of fishes. Watershed management would provide benefits to wildlife by maintaining or restoring habitat conditions through the establishment of DPC objectives, buffer zones placed around riparian areas, and restrictions on surface disturbance within riparian areas and flood plains. Actions that would maintain or improve watershed conditions would generally benefit the ecological condition of wildlife and fish habitats.

Management actions designed to improve water quality and watershed health would indirectly benefit wildlife and fish species. 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 flood plains. Many of the wildlife species present within the RMPPA have adaptations to current water quality and quantity conditions; therefore, maintaining these conditions would generally maintain habitat for these species. With Special Status Species, this could be extremely important in maintaining viable populations. Management actions

designed to remedy water quality impairments listed on the 303d list of impaired water bodies would, in some cases, result in increased habitat suitability for native fishes.

Wild Horse Management

Competition between wildlife, specifically big game species, and wild horses for forage and habitat would occur. Wild horses tend to dominate water sources and drive wildlife away. Wild horse use of desert riparian and wetland areas would decrease the value of these areas for fish and wildlife by affecting habitat complexity and stability.

Wildlife and Fish Management

Maintaining, enhancing, and restoring wildlife habitat with the RMPPA, 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 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 Endangered Species Act, and promote recovery as identified in the provisions of the ESA and BLM sensitive species policies. Impacts to threatened and endangered, candidate, and proposed species have been analyzed in the Biological Assessment (BLM 2004b).

Greater sage-grouse populations have been declining during the last half of the century as a result of such factors as habitat degradation, fragmentation, and loss (Chapter 3). As oil and gas development and other surface disturbing activities increase, impacts to Greater sage-grouse, raptor, and big game populations have increased. Intensive management, such as seasonal and timing restrictions and buffers, would be implemented for sage-grouse and raptor species to minimize impacts. Mitigation measures applied during critical time periods would also reduce disturbances to big game parturition and winter habitat. Fence modifications would reduce impacts to big game migration by reducing injury and entanglement.

A guzzler/water development specifically designed for wildlife would increase usable habitat for some big game species. 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 result. 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).

4.19.1 Impacts Under Alternative 1: Continuation of Existing Management

Fire and Fuels Management

Fire management would impact about 84,000 acres during the 20-year planning period. The response to a wildland fire would be based on an evaluation of risk to firefighter and public safety, the circumstances under which the fire occurs, including weather and fuel conditions, and resource values. This response

will allow not only for protection of natural and cultural resources but also for fire to fulfill its ecological role.

Forest Resource Management

Impacts to wildlife and fish management from a harvest level of 10 million board feet (MMBF) from 25,900 acres would have positive and negative impacts to fish and wildlife habitats, depending on the habitat requirements and life history characteristics of individual species. Approval of harvest activities within areas of steep slopes and riparian areas on a case-by-case basis might occasionally result in the loss or degradation of fish and wildlife habitats.

The use of a multitude of forest management tools would give more flexibility to wildlife and fish habitat management efforts. The application of a multitude of forest management tools would occasionally decrease the possibility of catastrophic events with the potential to negatively affect wildlife and fish habitats. In all timber sales, the needs of fish and wildlife would be considered so that habitat conditions would be maintained or improved. In addition, limitation of clear-cuts to 10 acres or less with irregular edges would help to ensure 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 impact about 5,794 acres during the 20-year planning period. The disposal of approximately 61,010 acres of BLM-administered public lands would result in a loss of wildlife or fish habitats from public ownership. The limited ability to manage isolated tracts identified for disposal under this alternative (Maps 2-22 through 2-25 and Appendix 7) makes these tracts less effective wildlife and fish habitats than BLM-administered lands located in areas of blocked ownership. The use of exchange as the preferred method of disposal, consolidation, or acquisition would allow the value wildlife and fish habitats to be compared before change in ownership. Consideration of sensitive or high-value wildlife and fish habitats in designing avoidance areas for the placement of wind energy developments, facility placement, 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.

Livestock Grazing Management

Under Alternative 1, roughly 900 acres would be used for constructing and/or developing range improvements during the 20-year planning period. Cattle grazing and sheep browsing would be managed in accordance with Standards for Healthy Rangelands (BLM 1997). This action will improve or maintain desired range conditions that support a diversity of wildlife and fish. In addition, this will result in the improvement or maintenance of habitats sufficient for listed species to not only recover and be delisted but also to avoid or prevent additional species becoming listed as well as to provide habitats for a diversity of native plant and animal species.

Minerals Management

Surface disturbing activities would be intensively managed. Leases would be issued with stipulations to protect resources and acreages. Impacts from minerals management that would occur on wildlife and fish species and associated habitat include habitat loss, degradation, fragmentation, and species displacement from oil and gas development (e.g., roads, pipelines, well pads, and associated facilities) on

approximately 16,538 acres during the planning period. These impacts to wildlife and fish management from oil and gas management would be moderate based on existing protective measures.

A combination of 857,040 acres of federal oil and gas leasable lands open to leasing consideration and subject to standard lease stipulations and 3,321,600 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations, such as seasonal restrictions, would cause some impacts to wildlife species. Species displacement can be short term and long term. These activities primarily affect big sagebrush, short grass, saltbush steppe, and greasewood habitat types, which are all common in the RMPPA. Big game, raptors, grouse, mountain plover, prairie dogs, and other sagebrush-obligate species are the principal wildlife species affected.

A combination of 343,140 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations such as NSO and 66,120 acres of federal oil and gas leasable lands closed to leasing should benefit wildlife species. NSOs would protect species that are dependent on specific habitat types. About 7,660 acres also would be closed to locatable mineral entry under proposed withdrawals, which would benefit wildlife species in these areas.

In addition, some wells are dry holes or abandoned producers, and these areas are reclaimed. After reclamation, these areas would remain dominated by herbaceous species, with desirable shrubs reestablishing in the long term. Early seral habitats would benefit wildlife species, such as mountain plover and prairie dogs, before use by wildlife dependent on shrubs.

Surface discharge of produced water that meets state standards for water quality would be allowed in the Colorado River Basin. Individual projects would be considered on a site-specific basis. Surface discharge of produced water that meets state standards and beneficial use for water quality would be allowed in the North Platte River Basin and Great Divide Basin.

Impacts of surface discharge of produced waters on the habitats of fish are variable. Both the quantity and quality of discharged waters could 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. For example, 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). If the discharged water were of poor quality, fish might be affected 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, decreasing the intermittence of flows might favor introduced fish over native fish that had evolved in the presence of a highly variable environment.

Off channel evaporation and percolation reservoirs for water disposal would replace upland wildlife habitats and require future reclamation. As these reservoirs dry in response to decreased water disposal they could potentially concentrate salts and trace metals to the point of toxicity for migratory birds and aquatic organisms.

Off-Highway Vehicle Management

In the Dune Ponds cooperative management area, OHV use is authorized in open sand areas west of Carbon County road 351 and existing roads and vehicle routes in the remainder of the area. Impacts to big game species, specifically pronghorn, would be moderate and include displacement and increased stress during critical time periods. The use of OHVs in the gathering of shed antlers would cause many

deer and elk undue stress if OHV operators harass them. Areas closed to OHV use (Map 2-5) would help avoid impacts associated with the disruption of wintering big game.

The authorized new roads would lead to increased OHV use in areas previously inaccessible, which would lead to displacement of wildlife and increased stress during critical time periods.

Special Management Areas

Intensive management of surface disturbing and other disruptive activities associated with existing oil and gas leases would reduce disturbance to wildlife and loss or alteration of their habitat and could be mitigated on a case-by-case basis. Developments, uses, and facilities would be managed spatially to minimize loss or alteration of wildlife habitat of higher value. In addition, Plans of Operations are required for all development. This will result in surveying of land before surface disturbing or disruptive activity begins and potential mitigation measures to minimize impacts. Therefore, quality habitat would be preserved while allowing for multiple-use.

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 provide habitats supportive of a recreational stream fishery for trout below the reservoir site. Big game species would benefit from existing seasonal closures by eliminating displacement or harassment caused by motor vehicle use during critical time periods.

Management of the Sand Hills ACEC (7,960 acres) would emphasize the preservation of the unique vegetation community to support wintering mule deer and elk.

The other areas proposed as SMAs (Stratton Sagebrush Steppe Research Area, Chain Lakes, Laramie Peak, Red Rim/Daley, Wick-Beumee, Pennock, Laramie Plains Lakes, historic trails, Blowout Penstemon, Upper Muddy Creek Watershed/Grizzly, White-Tailed Prairie Dogs, Rawlins OHV SRMA) would be managed for multiple uses similar to the remainder of the RMPPA 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.

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.

Conifer encroachment into shrublands, aspen, and riparian habitat would be controlled to maintain a mixture of plant communities and vegetative structure to support a diversity of wildlife.

Noxious and invasive weeds are expanding and would need to be controlled to prevent their spread into native plant communities. Spread of noxious and invasive weeds would impact 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. 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 reduce these impacts in treated areas.

Visual Resource Management

Impacts from visual resource management on wildlife and fish species and associated habitat would be negligible.

Water Quality, Watershed, and Soils Management

Discharge of waters produced from CBNG development within the Colorado River and Platte River Basins would have variable effects on populations of aquatic species. Within the Colorado River Basin, discharge of produced waters would alter receiving waters within the Muddy Creek watershed that contain populations of four species listed as sensitive by BLM Wyoming: Colorado River cutthroat trout, flannelmouth sucker, bluehead sucker, and roundtail chub. With the exception of the Colorado River cutthroat trout, these species have adapted to the highly variable environmental conditions typical of the Colorado River Basin. This highly variable environment is typified by dramatic annual fluctuations in streamflow (floods) and turbidity (sediment transport). These conditions are thought to favor these native fishes over introduced competitors. Discharge of produced waters would act to moderate annual fluctuations in streamflow and decrease turbidity, thereby decreasing the variability of these systems.

Additional impacts associated with the discharge of waters produced from CBNG development in the Colorado River and Platte River Basins would include changes to stream channel geometry (i.e., channel incision) resulting from increased streamflow. These changes to channel geometry would in some cases result in simplified channel geometry lacking the diversity of instream habitat features required to meet the habitat requirements of fishes.

Avoidance of surface disturbing and other disruptive activities within 100-year flood plains, 500 feet from perennial waters, springs, wells, and wetland/riparian areas, and 100 feet from the inner gorge of ephemeral channels would act to preserve habitats for various fish and wildlife species occurring in or downstream of these areas.

Water depletions within the Muddy Creek watershed 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.

Wild Horse Management

Ensuring that proper herd objectives are maintained would help reduce the competition between wild horses and wildlife species and improve the suitability of riparian and wetland habitats for various fish and wildlife species.

Wildlife and Fish Management

Mitigation measures during critical time periods reduces disturbance to breeding, nesting, and wintering raptors. Intensive management actions within RCAs would reduce physical disturbance of raptor habitat and disturbance of the birds. The seasonal restrictions for active raptor nests from February 1 through July 31 would reduce impacts to most nesting raptors. Raptor nesting restrictions would be applied within a buffer of three-quarters of a mile to 1 mile, depending on the species affected. Surface disturbing and other disruptive activities would not be authorized within 825 feet of active raptor nests, and within 1,200 feet of active ferruginous hawk nests, which would reduce disturbance to most nesting raptors, increasing nesting success. These restrictions do not reflect species-specific requirements and do not adequately protect nesting goshawks and burrowing owls.

Seasonal restrictions within bald eagle winter habitats between November 15 and April 30 would reduce disturbance to this species during this critical time period. Surface disturbing and other disruptive activities are not prohibited within 2 miles of a communal roost from February 1 to July 15, potentially increasing disturbance to bald eagles and loss of roost trees.

Development that is located within one-quarter 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. In addition, elevated artificial noise levels audible at the lek, such as from compressor stations and well drilling, 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, as well as the use of mufflers on compressor stations, decreases this impact. Surface disturbing and other disruptive activities would be allowed within one-quarter mile of Columbian sharp-tailed and Greater sage-grouse leks in the least disruptive location from the lek on a case-by-case basis. In addition, surface disturbing and other disruptive activities within 2 miles of Greater sage-grouse leks and 1 mile of Columbian sharp-tailed leks would not be allowed between March 1 and June 30. No surface disturbing and other disruptive activities would be allowed within grouse winter concentration areas from November 15 to April 30. These restrictions would reduce potential impacts to both breeding and nesting grouse and their habitat.

Although rare, development activities would not be allowed within identified big game parturition areas between May 1 and June 30, which would eliminate disturbance of these species during this period.

Surface disturbing and other disruptive activities associated with development are potentially disruptive to wintering big game species would not be allowed between November 15 and April 30. This would reduce the stress to big game during these critical times. Crucial winter range would be protected from surface disturbing and other disruptive activities during critical time periods; 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. On occasion, exceptions are granted based on a site-specific analysis, to allow for activities in these areas that would not impact big game species.

Proposals for conducting yearlong surface disturbing and other disruptive activities in seasonally sensitive habitats would not be considered. This would benefit various wildlife species by protecting them from disturbances during critical periods of their annual cycle. During these critical time periods, wildlife depend on the ability to use limited habitats to fulfill their life history requirements.

Modification of fences that have been identified as impacting the migrations of big game to BLM standards would help minimize the rate of injury and entanglement of these species. Although any new fences constructed within these corridors would be designed to BLM standards, they would still restrict movement of these species.

The management of wetland/riparian areas to improve their PFC rating would improve habitat conditions for various fish and wildlife species. Because the PFC assessment methodology does not incorporate the habitat requirements of fish and wildlife, additional management would be necessary to ensure that habitats provide conditions suitable to meet the life history requirements of various fish and wildlife species.

The use of BMPs for neotropical migratory birds, other migratory birds, and waterfowl and their habitats to mitigate the impacts 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 26).

Avoiding surface disturbing and other disruptive activities in identified 100-year flood plains, areas within 500 feet of perennial waters, springs, wells, and wetlands and areas 100 feet from the inner gorge of ephemeral drainages would help to maintain the functionality of aquatic ecosystems for various fish and amphibian species.

Under this alternative, road crossings would be designed to BLM standards, which do not consider the movement of aquatic species or the hydrologic connectivity of stream systems. 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 because of localized environmental variation, restrictions of fish passage eliminate the possibility of the area being recolonized from a neighboring population.

Attempts to minimize the impacts of impoundments 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.

Summary

Under Alternative 1, there would be significant impacts from vegetation and weed treatments, which would benefit species, but low levels allow proliferation of noxious and invasive weeds, which would allow habitats to be dominated by late-successional plants. In addition, 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 anticipated would lead to increasing habitat loss and fragmentation. In addition, surface disposal of waters from oil and gas activities would alter local hydrologic processes and fish habitats.

Moderate impacts would result from livestock management, minerals development, OHV activities, wild horse use, and vegetation management in riparian and wetlands areas to meet PFC objectives, road crossings, impoundments, and in-stream structures.

Although the degree of impacts might vary from significant to moderate, impacts would result in habitat alteration, fragmentation, and disturbance to wildlife from their daily activities (i.e., feeding, breeding, and sheltering).

4.19.2 Impacts Under Alternative 2: Emphasis on Development of Resources

Fire and Fuels Management

Impacts to wildlife and fish habitats from fire and fuels management would be similar to Alternative 1, except that suppression activities would emphasize suppression of all wildland fires regardless of ignition source. This would lead to positive and negative impacts to wildlife species. At the local level, fire suppression would benefit species that depend on that site-specific area. However, in general, wildland fire is a natural component of the ecosystem and provides for a diversity of habitat that different species depend on. Suppression activities decrease the opportunity for wildland fire to maintain its natural role in the ecosystem.

Forest Resource Management

Impacts would be similar to Alternative 1, except that the allowable MMBF removed by timber harvest would double, which would lead to increased wildlife habitat associated with early seral plant

communities and decreased wildlife habitat associated with late seral plant communities. This level would have a moderate effect on wildlife resources in forest and woodland environments. The maximum clear-cut size would increase from 10 to 100 acres and select-cut size would increase from 20 to 200 acres. This would open larger spaces in the forest, which would impact some wildlife species. In addition, timing restrictions for big game species, including crucial winter range and parturition areas, and grouse species, including breeding, nesting, and wintering areas, would be removed, which would allow activities that would potentially disrupt these species during critical time periods. The lack of NSO around raptor nests and grouse leks would negatively impact these species if timber harvest activities occurred during critical time periods. There would be an increase in multiseral stages, aspen, and associated understory, which would provide better habitat for prey base species. Raptor timing restrictions within one-half mile of nests have been modified to reflect the needs of individual species; therefore, timber harvest activities would not disturb nesting raptors.

The increase in cut size would increase open areas in the forest benefiting elk, bighorn sheep, and deer by providing forage and increasing edge-effect. In addition, these cuts would improve big game movement through timber by decreasing timber and downed logs and increasing visual security.

Impacts under this alternative would be similar to impacts under Alternative 1, except that increased harvest rates would lead to a greater magnitude of impacts to fish habitats found in forest ecosystems. This would negatively affect the suitability of habitats for coldwater fishes such as trout and would reduce the availability of recreational angling opportunities.

Lands and Realty Management

Types and acreage of disturbance would be the same as under Alternative 1, except some activities would be restricted to designated ROW corridors, which would reduce new loss or alteration of habitat, and displacement or mortality of wildlife.

Livestock Grazing Management

Roughly 1,140 acres would be used for livestock and range improvements under Alternative 2. Under this alternative, additional impacts resulting from an emphasis on livestock production would occur. Examples of impacts on fish and wildlife include increased impacts from water developments, pasture fencing, and direct competition for forage and space. This alternative would impede progress toward meeting objectives for fish and wildlife habitats.

Minerals Management

Impacts would be similar to Alternative 1, except that 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. Development activities in these habitats would result in loss or alteration of Critical habitats and increase stress, displace species, and lower reproductive success of wildlife. Development activities within migration/transition ranges would be considered before authorization to prevent the loss of and/or to reduce stress to big game species. In addition, there would be no NSO restrictions around raptor nests and the distance restrictions for timing stipulations for raptor nesting decreases to one-half mile from three-quarters to 1 mile, increasing the potential to disturb nesting raptors leading to possible nest abandonment. Therefore, impacts from minerals management that would occur on wildlife and fish species and associated habitat would be significant and would include habitat loss, degradation, fragmentation, and species displacement from oil and gas development.

A combination of 1,382,470 acres of federal oil and gas leasable lands open to leasing consideration and subject to standard lease stipulations and 2,880,710 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations, such as seasonal restrictions would cause some impacts to wildlife species. Species displacement can be short term and long term. These activities primarily affect big sagebrush, short grass, saltbush steppe, and greasewood habitat types, which are all common in the RMPPA. Big game, raptors, grouse, mountain plover, prairie dogs, and other sagebrush-obligate species are the principal wildlife species affected.

A combination of 258,110 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations such as NSO and 66,610 acres of federal oil and gas leasable lands closed to leasing should benefit wildlife species. NSOs would protect species that are dependent on specific habitat types. In addition, about 8,390 acres would be closed to locatable mineral entry under proposed withdrawals, which would benefit wildlife species in these areas.

Surface discharge of produced water that meets state standards for water quality would be allowed in the Colorado River Basin. Individual projects would be considered on a site-specific basis. Surface discharge of produced water that meets state standards and beneficial use for water quality would be allowed in the North Platte River Basin and Great Divide Basin.

Locatable and common variety mineral extraction activities are on a relatively small scale as compared with leasable mineral development and as such, impacts would be minimal to wildlife species.

Off-Highway Vehicle Management

Impacts from OHV management under this alternative would be the same as under Alternative 1.

Special 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 management area (30,470 acres) would be managed under the current MOU, therefore, impacts are the same as Alternative 1. Without the special management 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. All other impacts to wildlife would be the same as the remainder of the RMPPA.

Transportation and Access Management

Under Alternative 2, easements would be pursued for transportation and access around WSAs, some SMAs, and HMAs, which would increase human use in these areas and would increase displacement of wildlife.

Vegetation Management

There would be an increase in vegetation acres treated (about 24,400 acres annually). The size of the treatments would be larger, and landscape-scale, compared with Alternative 1. This would result in a mixture of early, mid- and late-seral condition classes of vegetation. This would benefit those species requiring larger expanses of early succession habitat, while still providing other seral classes communities to support all wildlife. The rejuvenation of older, decadent shrub communities increases 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. Other species requiring more edge effect and smaller mosaics of vegetation diversity would be negatively impacted. 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.

Noxious and invasive weeds would expand and would need to be controlled to prevent their spread into native plant communities. Spread of noxious and invasive weeds would impact 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. Roughly 25,646 acres would be treated annually to control noxious and invasive weeds, which would maintain and improve wildlife habitat.

Visual Resource Management

Impacts under this alternative would be the same as those described under Alternative 1.

Water Quality, Watershed, and Soils Management

Impacts under this alternative would be the same as those described under Alternative 1.

Wild Horse Management

Impacts under this alternative would be the same as those described under Alternative 1.

Wildlife and Fish Management

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. Development activities in these habitats would result in loss or alteration of Critical habitats and increased stress, displacement of species, and lower reproductive success of wildlife. In addition, there would be no NSO restrictions around raptor nests and the distance restrictions for raptor nesting decreases to one-half mile from three-quarters to 1 mile, increasing the potential to disturb nesting raptors. Timing stipulations would vary for species-specific needs, and provide protection during sensitive life cycles. The decrease in distance restrictions would lead to nest abandonment and lower fledgling reproduction. The seasonal restrictions for active raptor nests would change from February 1 through July 31 to February 1 through September 15. However, species-specific timing restrictions would also be altered to better reflect the individual species' requirements, which would increase protection for burrowing owls and goshawks during critical periods. Winter disturbance in Greater sage-grouse/Columbian sharp-tail grouse winter concentration areas would be authorized, potentially increasing stress to these species during winter.

Avoiding surface disturbing and other disruptive activities in identified 100-year flood plains, areas within 500 feet of perennial waters, springs, wells, and wetlands and areas 100 feet from the inner gorge of ephemeral drainages would help to maintain the functionality of aquatic ecosystems for various fish and amphibian species.

Under this alternative, road crossings would be designed to BLM standards, which do not consider the movement of aquatic species or the hydrologic connectivity of stream systems. 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 because of localized environmental variation, restrictions of fish passage eliminate the possibility of the area being recolonized from a neighboring population.

Attempts to minimize the impacts of impoundments 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.

Summary

It is anticipated that a larger number of acres of land would be disturbed under Alternative 2. Significant impacts would result from surface disposal of waters from oil and gas activities and mineral development.

Moderate impacts would result from livestock management, vegetation, fuels and weed treatments, OHV activities, wild horse use, and habitat alteration and fragmentation from road crossings, impoundments, and instream structures.

4.19.3 Impacts Under Alternative 3: Emphasis on Protection of Resources

Fire and Fuels Management

Impacts to wildlife and fish habitats from fire and fuels management would be negligible. Wildland fire suppression activities and fuel reduction (WUI) projects would be conducted according to the appropriate fire management requirements with an emphasis on 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 wildfire in natural ecological processes. This would benefit a diversity of wildlife habitats by improving habitat diversity.

Forest Resource Management

Management designed to promote forest health under this alternative would utilize a multitude of management tools with an emphasis on natural processes. Approximately 28,210 acres would be disturbed from treatment and woodland product harvest. This management approach would result in forest conditions most similar to natural conditions in which wildlife and fish populations have evolved.

Lands and Realty Management

Types and acreage of disturbance from lands and realty management to wildlife habitat management would be the same as Alternative 1, except additional Critical habitat would be protected. Also, construction activities restricted to designated ROW corridors would reduce displacement or mortality of wildlife and loss or alteration of habitat. The elimination of land disposal under this alternative would have either positive or negative effects on wildlife and fish habitats. The exchange of isolated tracts for lands located in areas of blocked BLM ownership might increase the effectiveness of wildlife and fish habitat management efforts in these areas. However, maintaining valued wildlife and fish habitats located in isolated tracts in public ownership might contribute to the ability to provide suitable habitats for species of management concern. Closure of areas of important resource values to new facility placement and routes and collocation of communications would help to avoid conflicts with sensitive wildlife and fish habitats resulting from these actions.

Livestock Grazing Management

Under Alternative 3, about 420 acres would be disturbed during the 20-year planning period. Livestock grazing management would emphasize achieving DPC objectives, which would incorporate consideration of wildlife and fish habitat requirements; thus increasing the suitability of the habitat for use by wildlife

and fish. There would be an emphasis on fence modifications to BLM standards and small-scale water developments. The fence modifications would reduce stress to wildlife during movement and migrations. Small-scale water developments would be designed to benefit wildlife, as well as livestock. 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 in these areas. Limiting livestock management options in big game crucial winter range would possibly lead to increased herbaceous dominance and decreased shrub cover reducing the value of the habitat.

The establishment of vacant allotments would increase the flexibility afforded to livestock grazing systems and would allow for sensitive fish and wildlife habitats in other areas to receive rest if needed to accomplish habitat objectives as identified by BLM.

Modification of all existing fences to BLM standards would reduce injury, entanglement, and entrapment of big game. Herding of domestic sheep in areas where BLM standard fence is inadequate to control use would result in more dispersed use of vegetative resources. This would reduce impacts on wildlife and fish habitats associated with localized sheep grazing.

Minerals Management

Under Alternative 3 surface disturbing and disruptive activities would be intensively managed to provide maximum protection for wildlife and fish habitat and sensitive life cycles. Leases would be issued with stipulations to protect wildlife and fish species sensitive life cycles and their associated habitat. Overall, surface disturbing and disruptive activities from mineral developments would be more restricted from both temporal and spatial stipulations. This would reduce disturbance to wildlife and their habitats. Leases would be issued with stipulations to protect resources and acreages. Impacts from minerals management that would occur on wildlife and fish species and associated habitat include habitat loss, degradation, fragmentation, and species displacement from oil and gas development (e.g., roads, pipelines, well pads and associated facilities) during the planning period. These impacts to wildlife and fish management from oil and gas management would be moderate based on identified protective measures.

A combination of 642,100 acres of federal oil and gas leasable lands open to leasing consideration and subject to standard lease stipulations and 2,407,810 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations, such as seasonal restrictions would cause some impacts to wildlife species. Species displacement can be short term and long term. These activities primarily affect big sagebrush, short grass, saltbush steppe, and greasewood habitat types, which are all common in the RMPPA. Big game, raptors, grouse, mountain plover, prairie dogs, and other sagebrush-obligate species are the principal wildlife species affected. Protection measures on additional acreage would reduce impacts to wildlife species.

A combination of 1,417,630 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations such as NSO and 120,360 acres of federal oil and gas leasable lands closed to leasing should benefit wildlife species. NSOs would protect species that are dependent on specific habitat types. In addition, about 272,350 acres would be closed to locatable mineral entry under proposed withdrawals, which would benefit wildlife species in these areas. Management actions to minimize disturbances to wildlife during sensitive time periods can be found in Table 2-10 (Seasonal Wildlife Stipulations for all Surface Disturbing Activities).

Off-Highway Vehicle Management

Impacts under this alternative would be the same as under Alternative 1, except that OHV use to retrieve big game kills and to access campsites would be limited to roads and vehicle routes, except where roads and vehicle routes are closed. Further reduction of designated road densities would decrease disturbance to wildlife and their habitat.

Recreation Resource Management

The Adobe Town fringe (31,510 acres) and West Ferris Mountain (5,270 acres) were found to have wilderness qualities. The restriction of permitted uses in the west Ferris Mountains and the Adobe Town fringe would protect habitat conditions for fish and wildlife in these areas from surface disturbances.

Special Management Areas

All WSAs would be closed to motorized vehicle traffic, which would reduce disturbance and stress to wildlife and eliminate alteration of habitats from vehicle use.

Intensive management of surface disturbing and other disruptive activities within the Como Bluff NNL (1,690 acres) would have minimal impacts to wildlife and fish habitats. Impacts would be addressed on a case-by-case basis and appropriate mitigation actions would be taken. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection. Off-road 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.

Intensive management of surface disturbing and disruptive activities within Como Bluff NNL associated with existing oil and gas leases would reduce impacts to wildlife habitats and could be mitigated on a case-by-case basis. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Off-road vehicle travel for "necessary tasks" would not be allowed, which would reduce disturbance and stress to wildlife and eliminate alteration of habitat from vehicle use.

The existing Sand Hills ACEC (7,960 acres) boundaries would be expanded to include the JO Ranch acquisition (total 12,700 acres). Off-road 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. Seasonal closure of the Sand Hills ACEC and JO Ranch Expansion area to motorized vehicles, limiting access to designated roads and vehicle routes, and closing the area to over-the-snow vehicles use would significantly benefit big game and other wildlife species by reducing the amount of human-wildlife conflicts that could occur. This would provide big game with a secure environment from disturbance, especially during winter. No new fences would be allowed and existing fences would be modified to meet BLM standards, which would improve big game movements and migrations through the area. Livestock grazing in the ACEC would emphasize enhancing the unique vegetation community and its value as crucial winter range for wildlife species. AMR for wildland fire would emphasize suppression, as well as the use of fuel breaks along existing roads and vehicle routes to minimize the size and impact of wildland fire on the unique vegetation community and crucial winter range. Surface disturbing and other disruptive activities would be prohibited (subject to valid existing rights) that would further protect the values for which this ACEC was designated.

Maintaining the integrity of the Jep Canyon Wildlife Habitat Management Area (13,810 acres) to protect crucial winter habitat for elk and nesting raptor pairs would have beneficial impacts for wildlife and their habitats. Intensive management of surface disturbing and other disruptive activities associated with existing oil and gas leases would reduce impacts to wildlife habitats and could be mitigated on a case-by-case basis. The area would be closed to new oil and gas leasing. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation. Limiting access to designated roads and vehicle routes and closing the area to over-the-snow vehicles use would significantly benefit big game and other wildlife species by reducing the amount of human-wildlife conflicts that could occur. This would provide big game with a secure environment from disturbance, especially during winter. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection. Off-road 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.

Maintaining the integrity of the Shamrock Hills Wildlife Habitat Management Area (18,400 acres) to protect nesting raptors and short-grass/big sagebrush obligate species would have beneficial impacts for these wildlife and their habitats. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Off-road 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.

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 and could be mitigated on a case-by-case basis. The area would be closed to new oil and gas leasing. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation. Off-road 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.

Management of the Chain Lakes Wildlife Habitat Management ACEC (30,470 acres) would provide benefits to wildlife, waterfowl, and shorebirds. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions, would reduce impacts to wildlife and their habitats, including the unique, alkaline desert wetlands, and could be mitigated on a case-by-case basis. The area would be closed to new oil and gas leasing. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection. Off-road 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. The Chain Lakes Wildlife Habitat Management ACEC would be managed as a vacant allotment. This would allow grazing to be used when necessary to meet the upland and wetland/riparian objectives and wildlife life history requirements.

Management of the Laramie Peak Wildlife Habitat Management ACEC (18,940 acres) would provide benefits to wildlife by allowing protection of crucial winter range habitats for mule deer, elk, and big horn sheep. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing would reduce impacts to wildlife habitats and could be mitigated on a case-by-case basis. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection. Off-road 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.

Plans of operation for locatable (except casual use) and material minerals, regardless of acreage, would address wildlife habitat disturbances and mitigation activities on a case-by-case basis.

Management of the Red Rim-Daley ACEC (15,980 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. Plans of operation, regardless of acreage, for locatable (except casual use) would address wildlife habitat impacts and mitigation activities on a case-by-case basis, which would reduce impacts to wildlife. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection.

Management of the Shirley Mountain Bat Cave as an ACEC (520 acres) would provide protection to the hibernaculum for the several bat species found within the cave system. Timber harvesting would not be allowed within one-half mile of the bat cave complex, which would allow the riparian area to remain undisturbed, protecting habitat values important to bat species. Withdrawals of these lands from public land tenure adjustments would ensure that they are retained in public ownership and managed to benefit wildlife habitat. Land tenure adjustments to block-up public lands would be pursued and would be beneficial to wildlife habitat protection. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions, would reduce impacts to bats and their habitats, and could be mitigated on a case-by-case basis. The area would be closed to new oil and gas leasing. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation. Closure to locatable mineral entry and mineral material sales also would occur, which would benefit wildlife species. Seasonal closure of Cave Creek Cave to human use from November 1 to March 31 would protect the existing bat hibernaculum. Off-road 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.

Management of the Laramie Plains Lakes ACEC (1,291 acres) would provide not only for benefits to potential crucial habitat for the endangered Wyoming toad but also for protection to habitats for big game, migratory waterfowl, and shorebirds. Withdrawals of these lands from public land tenure adjustments would ensure that they are retained in public ownership and managed to benefit wildlife habitat. Land tenure adjustments to block-up public lands and easements would be actively pursued and would be beneficial to wildlife habitat protection. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions would reduce impacts to potential Wyoming toad habitat and other wildlife habitats and could be mitigated on a case-by-case basis. The area would be closed to new oil and gas leasing. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Off-road 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. Livestock grazing would be managed to meet ACEC objectives, which would maintain and enhance potential Wyoming toad habitat.

Management of Historic Trails ACEC (41,000 acres) on wildlife and fish management would benefit wildlife habitat by closing areas within one-quarter mile of contributing portions of the trail to locatable mineral entry and mineral material sales. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions would reduce disturbance to wildlife and their habitats and could be mitigated on a case-by-case basis.

Management of the Blowout Penstemon ACEC (4,020 acres) would provide benefits to habitat for the endangered blowout penstemon, as well as upland and riparian habitats used by big game, Greater sage-

grouse, and other wildlife species. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions, would reduce impacts to habitat and could be mitigated on a case-by-case basis. Land tenure adjustments to block-up public lands and easements would be actively pursued and would be beneficial to wildlife habitat protection. Off-road 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. 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.

Management of the Upper Muddy Creek Watershed/Grizzly ACEC (27,533 acres) would provide benefits to fish and wildlife by pursuing expansion of reintroduction efforts for native warmwater and coldwater fishes into adjacent habitats and promoting the enhancement of seasonal and crucial winter range habitats for big game in this area. Intensive management of surface disturbing and other disruptive activities associated with existing oil and gas leases, and other authorized actions, would reduce impacts to habitat and could be mitigated on a case-by-case basis. There would be an NSO on new oil and gas leases within ¼ mile of intermittent and perennial streams, which would eliminate adverse alteration of riparian habitats resulting from these activities that might alter the suitability of fish habitats. Surface disturbance would be avoided within one-quarter 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. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands and easements would be actively pursued and to increase the effectiveness of fish and wildlife habitat management efforts. Plans of operation for locatable (except casual use) and material minerals, regardless of acreage, would address wildlife habitat disturbances and mitigation activities on a case-by-case basis. 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 be the same as the remainder of the RMPPA, except Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Land tenure adjustments to block-up public lands and easements would be actively pursued and would be beneficial to wildlife habitat protection. Minerals development would be restricted to a maximum of four surface locations per section. Drilling of multiple well bores from a single well pad would reduce impacts to prairie dogs by reducing the number of surface locations and surface area disturbance. This reduces stress to prairie dogs and affords greater protection to the complexes from habitat loss and alteration. Surface disturbing and other disruptive activities would not be allowed within 164 feet of identified white-tailed prairie dog towns. In addition, aboveground facilities would not be allowed within one-quarter mile of prairie dog towns unless they are equipped with anti-raptor perching devices. These would minimize disturbance and potential predation to prairie dogs.

Management of the High Savery Dam and Reservoir ACEC (520 acres) would be similar to those of Alternative 1, except that this area would be closed to locatable mineral entry and mineral material sales, which would reduce disturbance to fish and wildlife and their habitat. Managing this area as a vacant

allotment would allow grazing to be used when necessary to meet the upland and wetland/riparian objectives and wildlife life history requirements. The area would be closed to land tenure adjustments, which would ensure these areas remain as public wildlife habitat.

Impacts of the Continental Divide National Scenic Trail SRMA on wildlife and fish management would be negligible.

Impacts of the North Platte River SRMA (3,550 acres, including the one-quarter mile area on either side of the river) on wildlife and fish management would be the same as those of Alternative 1, except that surface disturbing and other disruptive activities would be intensively managed within one-half mile of the river corridor, which would minimize disturbance to wildlife and their habitat.

Impacts of the Rawlins OHV SRMA (480 acres) on wildlife and fish management on wildlife and fish management would be negligible.

Impacts of NNLs on wildlife and fish management would be the same as those of Alternative 1.

Impacts of the Encampment River Proposed WSR on wildlife and fish management would be the same as those of Alternative 1.

Transportation and Access Management

Impacts from Transportation and Access Management under this alternative would be the same as under Alternative 1.

Vegetation Management

Vegetation management would emphasize achieving DPC objectives, which would incorporate consideration of wildlife and fish habitat requirements, thus increasing the suitability of the habitat for use by wildlife and fish. There would be a fivefold increase in vegetation acres treated (11,800 acres annually) under this alternative. The size of the treatments would be smaller and more numerous, with an emphasis on edge effect and mosaic pattern application. This would result in habitat alteration that would benefit the highest population of wildlife species. The proportion of early and mid-seral condition classes of vegetation would increase; however, the amount of late-seral condition classes would be higher than desired to benefit wildlife.

Noxious and invasive weeds would expand and would need to be controlled to prevent their spread into native plant communities. This 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.

All other impacts would be the same as Alternative 1.

Visual Resource Management

Impacts under this alternative would be same as those described under Alternative 1.

Water Quality, Watershed, and Soils Management

Injection of waters produced from CBNG development in the Colorado River Basin would preserve natural hydrological conditions, thereby maintaining the highly variable environment in which several

sensitive fishes have evolved. The discharge of waters produced from CBNG development in the North Platte River drainage would have impacts to fish habitats similar to those described under Alternative 1.

The management of wetland/riparian areas toward their DPC would improve habitats for various fish and wildlife species dependent on these areas by incorporating habitat requirements into DPC objectives.

By restricting water development projects that would lead to depletions in the Colorado River system, natural hydrologic conditions would be preserved, which would maintain the quantity of fish habitats at their present levels.

The exclusion of surface disturbing and other disruptive activities within 100-year flood plains, 500 feet from perennial waters, springs, wells, and wetland/riparian areas, and 100 feet from the inner gorge of ephemeral channels would act to preserve habitats for various fish and wildlife species occurring in or downstream of these areas.

The protection afforded the Encampment River Watershed would act to preserve habitats for various fish and wildlife species that use this area.

Wild Horse Management

Impacts under this alternative would be the same as under Alternative 1, except there would be an increase in AML of 95 horses in the Lost Creek HMA. This would increase competition with wildlife for water, forage, and habitat requirements in this area. Increase in wild horse populations would further exasperate riparian/wetland habitat degradation, thereby reducing the suitability of these habitats for wildlife and fish species.

Wildlife and Fish Management

The elimination of animal damage control by APHIS on public lands would have localized impacts on predator/prey relationships from a reduction in the removal of targeted species (e.g., mountain lions, coyotes, prairie dogs) and benefit populations of targeted predators and prey species.

The disturbance zone for active raptor nests would be increased to 1.5 miles from three-quarters to 1 mile. This would incrementally decrease disturbance to nesting raptors. There would be an NSO within one-quarter mile of active raptor nests. Species-specific timing restrictions would be altered to better reflect the individual species' requirements that would increase protection for burrowing owls and goshawks during critical periods. An NSO would be applied within one-half mile of bald eagle communal roost sites. There would be a timing restriction on surface disturbing and other disruptive activities in bald eagles communal winter roost sites between November 1 and April 1. There would also be a timing restriction on surface disturbing and other disruptive activities in bald eagles communal roost sites between February 1st and July 15th. No disturbance would be allowed within raptor concentration areas on new leases; thus, no impacts would occur to the raptors from mineral development actions on new leases. Existing leases within RCAs would be intensively managed to minimize disturbance to raptors from minerals development. These restrictions would reduce disturbance to raptors.

There would be NSO for surface disturbing and other disruptive activities within one-quarter mile from the perimeter of Columbian sharp-tailed and Greater sage-grouse leks. Human activity would be avoided with one-quarter mile of this perimeter between 6:00 p.m. to 9:00 a.m. from March 1 to May 20. In addition, surface disturbing activities within 2 mile of Greater sage-grouse leks and 1 mile of Columbian sharp-tailed grouse leks would not be allowed between March 1 and July 15. Within the Rawlins to Baggs geographic area, the buffers around leks are expanded to 4 miles for Greater sage-grouse and 2

miles for Columbian sharp-tailed grouse. Once nesting habitat is identified in the RMPPA, the distances (buffers) would be revised to reflect actual nesting habitat boundaries, and those areas would all be protected. These restrictions would better reflect breeding and nesting periods, which would reduce potential disturbance and habitat loss, and increase reproductive success of grouse. No surface disturbing and other disruptive activities would be allowed within grouse winter concentration areas from November 15 to March 14. There would be no high profile structures within 1 mile of active grouse leks or one-quarter mile of white-tailed prairie dog towns. There would be an NSO of 164 feet from the perimeter of prairie dog towns. These restrictions would reduce habitat alteration, predation, and disturbance to grouse and prairie dogs.

There would be an NSO for identified big game parturition areas and T&E habitat that would protect these areas from disturbance. Development activities within migration/transition ranges would be managed on a case-by-case basis before authorization to prevent the loss of and/or reduce stress to big game species.

Surface disturbing and other disruptive activities associated with development are potentially disruptive to wintering big game species would not be allowed between November 15 and April 30. This would reduce the stress to big game during these critical times. Crucial winter range would be protected from surface disturbing and other disruptive activities during critical time periods; 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. On occasion, exceptions are granted based on a site-specific analysis, to allow for activities in these areas that would not impact big game species.

Proposals for conducting yearlong surface disturbing and other disruptive activities in seasonally sensitive habitats would not be considered. This would benefit various wildlife species by protecting them from disturbances during critical periods of their annual cycle. During these critical time periods, wildlife depends on the ability to use limited habitats to fulfill their life history requirements.

All fences would be modified to meet BLM standard and more guzzlers/water developments would be constructed. This would allow for easier migration of big game and more reliable water sources in wildlife habitat areas, and reduce injury or entanglement of big game.

The management of wetland/riparian areas to achieve their DPC rating would improve habitat conditions for various fish and wildlife species. Establishment of DPC for wetland/riparian areas would consider the set of habitat conditions necessary to support desired fish and wildlife species.

The use of BMPs for neotropical migratory birds, other migratory birds, and waterfowl 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 26).

Exclusion of surface disturbing and other disruptive activities from identified 100-year flood plains, areas within 500 feet of perennial waters, springs, wells, and wetlands and areas 100 feet from the inner gorge of ephemeral drainages would maintain the functionality of aquatic ecosystems for various fish and amphibian species.

Under this alternative, road crossings would be designed to simulate natural stream processes (Appendix 26) and would be designed to allow for the unimpeded movement of aquatic species and hydrologic connectivity of stream systems.

Under this alternative, impacts associated with habitat alteration, habitat fragmentation, and spread of exotic fishes resulting from the construction of impoundments on streams known to support populations of native fishes would not occur.

Summary

Under Alternative 3, the greatest amount of protection for wildlife and fish species, associated habitats, and sensitive life cycles.

Moderate impacts would result from vegetation management in riparian wetland areas to meet DPC, livestock management, minerals management, OHV activities, and wild horse use. Fire and fuels management would displace wildlife but would provide natural disturbance regimes to maintain diversity.

4.19.4 Impacts Under Alternative 4: Preferred Alternative

Fire and Fuels Management

Under Alternative 4, there would be about 212,000 acres of disturbance from fire and fuels management. In addition, there would be a greater emphasis on the use of wildland fire for resource benefit. The use of wildland fire for resource benefit would provide benefits to wildlife habitats by increasing the influence of fire in natural ecological processes.

Forest Resource Management

A reduction in timber harvest activities on 6,700 acres of riparian areas and steep slopes would reduce disturbance to fish and wildlife from these activities. All other activities would have the same impacts as Alternative 1.

Lands and Realty Management

Types and acreage of disturbance from lands and realty management to wildlife habitat management would be the same as Alternative 1, except Critical habitat for grouse leks would be protected. In addition, construction activities restricted to designated ROW corridors and additional intensive management practices would reduce displacement or mortality of wildlife and loss or alteration of habitat.

Livestock Grazing Management

Under Alternative 4, about 920 acres would be disturbed during the 20-year planning period. Wildlife habitat objectives would be considered for all surface disturbing and disruptive activities. Priority would be given to meeting Standards for Healthy Rangelands (BLM 1997) and to meeting desired plant community. Livestock grazing management and Standards of Healthy Rangelands (BLM 1997) would emphasize achieving DPC objectives, improving range conditions, and achieving rangeland standards. These actions would incorporate consideration of wildlife and fish habitat requirements, thus increasing the suitability of the habitat for use by wildlife and fish.

The establishment of vacant allotments would increase the flexibility afforded to livestock grazing systems and would allow for sensitive fish and wildlife habitats in other areas to receive rest if needed to accomplish habitat objectives as identified by BLM.

Herding of domestic sheep in areas where BLM standard fence is inadequate to control use would result in more dispersed use of vegetative resources. This would reduce impacts on wildlife and fish habitats associated with localized sheep grazing.

Minerals Management

Impacts under this alternative are similar to those described under Alternative 1, except that the acreages available for oil and gas development activities are different. Surface disturbing activities would be intensively managed. Leases would be issued with stipulations to protect wildlife and fish species sensitive life cycles and their associated habitat.

A combination of 853,690 acres of federal oil and gas leasable lands open to leasing consideration and subject to standard lease stipulations and 3,279,670 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations, such as seasonal restrictions, would cause some impacts to wildlife species. Species displacement can be short term and long term. These activities primarily affect big sagebrush, short grass, saltbush steppe, and greasewood habitat types, which are all common in the RMPPA. Big game, raptors, grouse, mountain plover, prairie dogs, and other sagebrush-obligate species are the principal wildlife species affected.

A combination of 377,590 acres of federal oil and gas leasable lands open to leasing consideration and subject to lease stipulations such as NSO and 76,950 acres of federal oil and gas leasable lands closed to leasing should benefit wildlife species. NSOs would protect species that are dependent on specific habitat types. In addition, approximately 28,724 acres would be closed to locatable mineral entry under proposed withdrawals, which would benefit wildlife species in these areas.

Off-Highway Vehicle Management

Impacts to wildlife species associated habitat from OHV management would be the same as Alternative 3.

Special Management Areas

All WSAs would be closed to motorized vehicle traffic (except Adobe Town [34,220 acres] would be restricted to designated roads and vehicle routes), which would reduce disturbance and stress to wildlife and eliminate alteration of habitats from vehicle use.

Intensive management of surface disturbing and other disruptive activities within the Como Bluff NNL (1,690 acres) would have minimal impacts to wildlife and fish habitats. Impacts would be addressed on a case-by-case basis and appropriate mitigation actions would be taken. However, opening the area to mineral material sales could have an impact on wildlife habitat, although it would be minor and would be mitigated. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection.

Seasonal closure of the Sand Hills ACEC and JO Ranch Expansion area (12,700 acres total) to motorized vehicles, limiting access to designated roads and vehicle routes, and closing the area to over-the-snow vehicles use would significantly benefit big game and other wildlife species by reducing the amount of human-wildlife conflicts that could occur. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing would reduce impacts to wildlife habitats and could be mitigated on a case-by-case basis. This would provide big game with a secure environment from disturbance, especially during winter.

Livestock grazing in the Sand Hills/JO Ranch ACEC would emphasize enhancing the unique vegetation community and its value as crucial winter range for wildlife species. AMR for wildland fire would emphasize suppression, as well as the use of fuel breaks along existing roads and vehicle routes, to minimize the size and impact of wildland fire on the unique vegetation community and crucial winter range.

Maintaining the integrity of the Jep Canyon Wildlife Habitat Management Area (13,810 acres) to protect crucial winter habitat for elk and nesting raptor pairs would have beneficial impacts for wildlife and their habitats. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing would reduce impacts to wildlife habitats and could be mitigated on a case-by-case basis. Limiting access to designated roads and vehicle routes and closing the area to over-the-snow vehicles use would significantly benefit big game and other wildlife species by reducing the amount of human-wildlife conflicts that could occur. This would provide big game with a secure environment from disturbance, especially during winter. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection.

Maintaining the integrity of the Shamrock Hills Wildlife Habitat Management Area (18,400 acres) to protect nesting raptors and short-grass/big sagebrush obligate species would have beneficial impacts for these wildlife and their habitats. However, the area would be opened to mineral material disposal. Surface disturbing and other disruptive activities associated with this activity would result in increased human presence, possible habitat fragmentation and harassment of wildlife.

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 and could be mitigated on a case-by-case basis. The area would be closed to new oil and gas leasing. Once existing leases expire, there would be no new disturbance to wildlife or their habitat, except from reclamation.

Management of the Chain Lakes Wildlife Habitat Management Area (30,470 acres) would include other compatible multiple uses and would provide benefits to wildlife, waterfowl, and shorebirds. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions would reduce impacts to wildlife and their habitats, including the unique, alkaline desert wetlands, and could be mitigated on a case-by-case basis. The Chain Lakes Wildlife Habitat Management Area would be managed as a vacant allotment. This would allow grazing to be used when necessary to meet the upland and wetland/riparian objectives and wildlife life history requirements.

Management of the Laramie Peak Wildlife Habitat Management Area (18,940 acres) would include other compatible multiple uses and would provide benefits to wildlife by promoting the protection of crucial winter range habitats for mule deer, elk, and big horn sheep. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing would reduce impacts to wildlife habitats and could be mitigated on a case-by-case basis. Land tenure adjustments to block-up public lands would be beneficial to wildlife habitat protection.

Management of the Red Rim-Daley Area (15,980 acres) would include other compatible multiple uses and would provide benefits to wildlife by promoting the protection of crucial winter range habitat for pronghorn, as well as seasonal habitat for Greater sage-grouse, mule deer, and other wildlife. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions would reduce impacts to wildlife and their habitats, and could be mitigated on a case-by-case basis.

Management of the Shirley Mountain Bat Cave as an ACEC (240 acres) would provide protection to the hibernaculum for the several bat species found within the cave system. Timber harvesting would not be allowed within one-quarter mile of the bat cave complex, which would allow the riparian area to remain undisturbed, protecting habitat values important to bat species. Closure of these lands from public land tenure adjustments would ensure that they are retained in public ownership and managed to benefit wildlife habitat. Land tenure adjustments to block-up public lands would be pursued and would be beneficial to wildlife habitat protection. In addition, closure to locatable mineral entry and mineral

material sales would occur, which would benefit wildlife species. Seasonal closure of Cave Creek Cave to human use from October 15 to April 30 would protect the existing bat hibernaculum.

Management of the Laramie Plains Lakes ACEC (1,600 acres) would include other compatible multiple uses and would provide not only for benefits to potential crucial habitat for the endangered Wyoming toad but also for protection to habitats for big game, migratory waterfowl, and shorebirds. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions would reduce impacts to potential Wyoming toad habitat and other wildlife habitats and could be mitigated on a case-by-case basis. Closure of these lands from public land tenure adjustments would ensure that they are retained in public ownership and managed to benefit wildlife habitat. Public lands would be open to mineral materials disposals with adequate consideration to not degrade potential Wyoming toad habitat. Off-road vehicle travel for "necessary tasks" would not be allowed. Although exceptions might be authorized on a case-by-case basis, these would be done following an environmental analysis; therefore, wildlife species should benefit.

Management of Historic Trails Area (contributing segments within 41,000 acres of federal land) on wildlife and fish management would benefit wildlife habitat by closing areas within one-quarter mile of contributing portions of the trail to mineral material sales, thereby reducing disturbance to wildlife and their habitat.

Management of the Blowout Penstemon ACEC (4,020 acres) would provide benefits to habitat for the endangered blowout penstemon, as well as upland and riparian habitats used by big game, Greater sage-grouse, and other wildlife species. Closure to locatable mineral entry and mineral material sales would reduce disturbance to wildlife and loss or alteration of their habitat. Intensive management of surface disturbing and other disruptive activities associated with oil and gas leasing and other authorized actions, would reduce impacts to habitat and could be mitigated on a case-by-case basis. Land tenure adjustments to block-up public lands, and easements, would be actively pursued, and would be beneficial to wildlife habitat protection. Off-road 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. 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.

Management of the Upper Muddy Creek Watershed/Grizzly area (70,780 acres) would include other compatible multiple uses, and would provide benefits to fish and wildlife by pursuing expansion of reintroduction efforts for native warmwater and coldwater fishes into adjacent habitats and promoting the enhancement of seasonal and crucial winter range habitats for big game in this area. Public lands would be open to mineral materials disposals with adequate consideration to not degrade BLM sensitive fishes habitat. Perennial stream channels would be avoided within 500 feet and ephemeral channels would be avoided within 100 feet for surface disturbing and other disruptive activities, which would provide protection to the fish and wildlife habitat.

Management of the White-tailed Prairie Dog areas would be the same as the remainder of the RMPPA. Current stipulations would adequately protect white-tailed prairie dogs and their habitat.

Impacts to the High Savery Dam and Reservoir area (530 acres) would be similar to those of Alternative 1, except that these areas would be closed to locatable mineral entry and mineral material sales, which would benefit wildlife species. Managing this area as a vacant allotment would be a significant benefit for wildlife habitat. Land tenure adjustments consistent with the current MOU would be considered if beneficial to wildlife habitat protection.

Impacts of the Continental Divide National Scenic Trail SRMA on wildlife and fish management would be negligible.

Impacts of the North Platte River SRMA (5,060 acres) on wildlife and fish management would be the same as those of Alternative 1.

Impacts of the Rawlins OHV SRMA (480 acres) on wildlife and fish management on wildlife and fish management would be negligible.

Impacts of the Encampment River Proposed WSR on wildlife and fish management would be the same as those of Alternative 1.

Transportation and Access Management

Under Alternative 4, easements would be pursued for transportation and access around WSAs, some SMAs, and HMAs, which would increase human use in these areas and would increase displacement of wildlife.

Vegetation Management

Vegetation management would emphasize achieving DPC objectives, which would incorporate consideration of wildlife and fish habitat requirements, thus increasing the suitability of the habitat for use by wildlife and fish. Management for DPC objectives in riparian areas would result in a mixture of herbaceous and multi-aged woody species, which would improve habitats for 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.

Noxious and invasive weeds would expand and need to be controlled to prevent their spread into native plant communities. This 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 meet wildlife habitat objectives.

Visual Resource Management

Impacts under this alternative would be the same as those described under Alternative 1.

Water Quality, Watershed, and Soils Management

Impacts under this alternative would be similar to those described in Alternative 1, except that not allowing surface discharge in the Colorado River Basin would preserve natural hydrologic conditions that support the diversity of native cold and warm water fishes. Protections afforded to the Encampment River Watershed would act to preserve current fish habitat conditions.

Wild Horse Management

Impacts under this alternative would be the same as under Alternative 1, except there would be an increase in AML of 95 horses in the Lost Creek HMA. This would increase competition with wildlife for water, forage, and habitat requirements in this area. Increase in wild horse populations would further exasperate riparian/wetland habitat degradation thereby reducing the suitability of these habitats for wildlife and fish species.

Wildlife and Fish Management

Under this alternative, the seasonal restrictions for active raptor nests changes from February 1 through July 31 to February 1 through September 15. However, species-specific timing restrictions would also be altered to better reflect the individual species' requirements, which would increase protection for burrowing owls and goshawks during critical periods. Intensive management actions within RCAs would reduce physical disturbance of raptor habitat and disturbance of the birds. Raptor nesting restrictions would be applied within a buffer of three-quarters to 1 mile depending on the species affected. Surface disturbing and other disruptive activities would not be authorized within 825 feet of active raptor nests, and within 1200 feet of active ferruginous hawk nests, which would reduce disturbance to most nesting raptors, increasing nesting success.

Surface disturbing and other disruptive activities associated with development are potentially disruptive to wintering big game species would not be allowed between November 15 and April 30. This would reduce the stress to big game during these critical times. Crucial winter range would be protected from surface disturbing and other disruptive activities during critical time periods; 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. On occasion, exceptions are granted based on a site-specific analysis, to allow for activities in these areas that would not impact big game species.

Proposals for conducting year-long surface disturbing and other disruptive activities in seasonally sensitive habitats would not be considered. This would benefit various wildlife species by protecting them from disturbances during critical periods of their annual cycle. During these critical time periods, wildlife depend on the ability to use limited habitats to fulfill their life history requirements.

Although rare, development activities would not be allowed within identified big game parturition areas between May 1 and June 30, which would eliminate disturbance of these species during this period.

Modification of fences that have been identified as impacting the migrations of big game to BLM standards would help to minimize the rate of injury and entanglement of these species. Although any new fences constructed within these corridors would be designed to BLM standards, they would still restrict movement of these species.

Surface disturbing and disruptive activities would be prohibited within one-quarter mile of occupied Greater sage-grouse leks (Map 3-13). In addition, this area would be an avoidance area for all human activity from 6:00 p.m. to 9:00 a.m. daily from March 1 to May 20. The actual area to be avoided, usually within one-quarter to one-half mile of the lek, and appropriate seasonal limitations would be determined on a case-by-case basis. Seasonal limitations on surface disturbing and other disruptive activities from March 15 to July 15 would apply up to 2 miles from Greater sage-grouse leks (nesting and early brood-rearing habitat) on a case-by-case basis (Map 3-13). Nesting and early brood-rearing habitats would be protected from habitat degradation, and measures would be taken to improve habitat quality within 2 miles from Greater sage-grouse leks on an as needed basis.

Disruptive activities would be prohibited in Greater sage-grouse winter concentration areas (Map 3-13) from November 15 to April 30.

The use of BMPs for neotropical migratory birds, other migratory birds, and waterfowl 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 26).

The management of wetland/riparian areas to achieve their DPC rating would improve habitat conditions for various fish and wildlife species. Establishment of DPC for wetland/riparian areas would consider the set of habitat conditions necessary to support desired fish and wildlife species.

Avoiding surface disturbing and other disruptive activities in identified 100-year flood plains, areas within 500 feet of perennial waters, springs, wells, and wetlands and areas 100 feet from the inner gorge of ephemeral drainages would help to maintain the functionality of aquatic ecosystems for various fish and amphibian species.

Under this alternative, road crossings would be designed to simulate natural stream processes (Appendix 26) and would be designed to allow for the unimpeded movement of aquatic species and hydrologic connectivity of stream systems.

Attempts to minimize the impacts of impoundments 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.

Summary

Under Alternative 4 moderate impacts would result from livestock management, minerals management, OHV activities, wild horse use.

Increased numbers of SMAs would benefit wildlife. Vegetation management in riparian and wetland areas to meet DPC would result in long-term benefits to wildlife, especially big game. In addition, fire and fuels management would displace wildlife, but provide natural disturbance regimes to maintain diversity.

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 defines 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 Non-Federal) 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*

Cumulative impact analysis is required because the environmental conditions are the result of many different factors that act together. The real effect of any single action cannot be determined by considering that action in isolation but must be determined by considering the likely result of that action when acting in conjunction with many others. The cumulative impact analysis for this Draft EIS evaluates the potential impacts associated with the Rawlins RMP management alternatives, in combination with the potential impacts associated with other relevant activities that have occurred, are occurring, or whose occurrence is considered likely in the vicinity of the RMPPA. Effects of past 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

This cumulative assessment is a programmatic, broad scale, qualitative assessment. BLM makes decisions about management of resources in a tiered process. Beginning with planning-level decisions, each subsequent level of decisions is based in part on higher-level decisions and information used in higher level decision making. Note that the planning-level decisions that BLM will make regarding the Rawlins RMPPA are programmatic decisions based on analysis that can only be conducted on a broad scale because of the nature of available information. Analysis of planning level decisions is very speculative with respect to projecting specific activities. Subsequent tiered documents would generally contain a greater level of detail and are also subject to NEPA assessment and compliance. Subsequent tiered Activity Plans are more definitive than plans found in an RMP; however, they are broader in scope than a project level decision document. Activity Plan analyses are generally more localized and less speculative than the RMP analyses. Project-level plans contain specific proposed actions, and site or area-specific analysis is conducted. For example, individual oil and gas wells or groups of wells in an established field are analyzed for localized or site-specific effects based on APDs. An APD provides the site-specific detail of industry's proposal, including the type of development that would occur under the oil and gas lease. A NEPA document presents effects analysis for the proposed well(s). A documented project decision allows the wells to be drilled and completed with site-specific mitigation.

A cumulative impact analysis is based on numerous assumptions. CEQ guidance limits cumulative impact analysis to important issues of national, regional, or local significance. Therefore, this cumulative impact assessment focuses only on actions and impacts that would potentially be significant. Criteria determining the significance of cumulative impacts are the same as presented for each resource above. Therefore, not all issues identified for direct or indirect impact assessment in this EIS 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 agencies of federal, state, and local government are the primary sources of information regarding past, present, and reasonably foreseeable future actions. Actions undertaken by private persons and entities are assumed to be captured in the information made available by such agencies.

It is important to understand that many of the reasonably foreseeable development and reasonably foreseeable actions covered in the Assumptions for Analysis Section are already "cumulative figures" for development within the RMPPA. As an example, the oil and gas figures include well numbers and surface disturbance for all related activities regardless of mineral ownership.

The potential cumulative impacts are described for each potentially 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. Evaluation of potential impacts considers incremental impacts that might occur from the proposed project, while also considering impacts from past, present, and reasonably foreseeable actions (RFA) within each of CIAA. RFAs are those future action activities that have been committed to or that are known proposals, which could take place within the 20-year planning period. RFA scenarios are projections made only for the prediction of future impacts; they are not actual planning decisions or resource commitments. Projections, which have been developed for analytical purposes only, are based on current conditions and trends and represent a best professional estimate of RFAs. Unforeseen changes in such factors as economics, demand, and federal, state, and local laws and policies could result in different outcomes than those projected for this analysis.

The CIAAs are described in each of the resource sections below. CIAAs 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 fire, 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.

Presentation of impacts to some resource topics presented above have been combined below as a result of the commonalities in potential impacts or minor potential for cumulative impacts.

4.20.2 Projects and Activities Considered

After review of available information, the following general types of activities were identified as having the greatest likelihood to generate potential cumulative impacts when added to activities associated with the Rawlins RMP management alternatives:

- BLM land management plans and activities outside the RMPPA boundary
- Regional oil and gas development activities (e.g., exploration, production, and pipeline development)
- Regional recreation activities (e.g., big game hunting, OHV use, dispersed recreation)
- Economic development activities in Albany, Carbon, Laramie, Fremont, and Sweetwater counties.

As shown from the impact assessment regarding mineral management presented earlier in this chapter, oil and gas development presents the highest likelihood for significant impacts. Decisions about managing oil and gas resources on public lands administered by BLM are made at two general levels. RMP level decisions include leasing decisions that result in issuance of oil and gas leases with the expectation that some exploration or development activity might be proposed some time in the future. Specific information for such actions are speculative. Project-level decisions encompass exploration and development decisions that result in more specific information such as spatial and temporal aspects of ground disturbance with wells, roads, and associated infrastructure.

Tables 4-5 and 4-6 lists existing and reasonably foreseeable oil and gas development, along with the number of producing wells and remaining wells that could still be developed for each of the projects, should development reach the ultimate level analyzed in its corresponding NEPA document. These numbers represent potential development based on the NEPA-approved totals. It is likely that these projects would not actually drill all the wells that are approved. For example, according to the Green River RMP and Final EIS (the RMP for the RMPPA to the west of the RMPPA), many existing wells will cease to produce based on historic records, with more than 70 percent of existing wells being plugged and abandoned by year 2010. However, it is anticipated that these would be replaced by new wells. In addition, the reasonably foreseeable development for oil and gas within the RMPPA takes into account the past well abandonment rates as well as new development in determining the level of surface

disturbance anticipated during the life of the plan. Other RFAs that would create the potential for cumulative impacts are listed in Table 4-6.

Table 4-5. 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
Riley Ridge	1/25/84	23	224
Burley	6/7/94	31	16
Jonah II Field	4/27/98	129	321
La Barge Coordinated Activity Plan Area	8/16/91	1,135	445
Soda Unit	4/12/89	3	18
Castle Creek	10/24/83	8	10
Moxa Arch	3/7/97	947	1,227
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	23
Creston Blue Gap	10/4/94	181	94
Dripping Rock/Cedar Break[1]	4/3/85	24	34
Sierra Madre	9/21/87	35	11
Hay Reservoir	6/24/92	28	0
Jack Morrow Hills	Pending	46	205
Continental Divide/ Wamsutter II	5/24/00	864	1,366
Pinedale Anticline	7/27/00	85	616
South Baggs	8/8/00	12	38
Bitter Creek Shallow Gas Project Area	Pending	14	0
Pacific Rim Shallow Gas	Pending	0	150
Copper Ridge	Pending	0	89
Vermillion Basin	8/15/02	0	56
Jonah Infill	Pending	0	1,250
Desolation Flats	7/27/04	21	364
South Piney	Pending	0	210
Lower Bush Creek	Pending	0	22
Seminoe Road	Pending	0	0
Atlantic Rim	Pending	0	0
Atlantic Rim Coalbed Natural Gas Exploration Pods	Ongoing	44	156
Wolverine/Shell	Ongoing	0	1
Little Monument	Pending	0	31
Total	–	4,770	8,254

[1]Superseded by the Desolation Flats project

Table 4-6. 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 112 million tons per year reaching a maximum of 4.2 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 6.6 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.
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 CO2 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, WY, 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.
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, UT.
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 big horn 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.
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.
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, WY (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, CO (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, WY. The proposed pipeline will be 24" in diameter and will follow an existing CIG pipeline.

Title	Description
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, Ribbon Forest). 15,476 acres of Research Natural Areas (Platte Canyon, Battle Mountain, Savage Run, LaBonte Canyon, 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 million board feet (MMBF) per year Allowable Sale Quantity (ASQ). Clearcutting 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.
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 Power River Basin.
U.S. Fish and Wildlife Service 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.

4.20.3 Impacts by Resource

Air Resources

The potential impacts from the air emissions described in Section 4.2 are analyzed based on 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 methane and conventional oil and gas development on existing and new leases within and outside the RMPPA. Wildland fires and prescribed burns that occurred within the CIAA would 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 State-wide 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 State-wide 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 4-7. (For further details, refer to Appendix 4).

Table 4-7. Summary of Emission Increases as Estimated by the Wyoming State-wide Emission Inventory and the BLM Emission Inventory

Air Pollutant	Emissions (tons per year)					
	Wyoming State-wide RFD[1]		BLM Sources[2]			
			RMPPA Alternatives			
	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	1047	1,132	699	934
$PM_{2.5}$	195	<0.1	397	429	275	368

[1] Reasonable Foreseeable Development (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 (Tables A4-5 through A4-7 in the AQTSD, Appendix 4)

Particulate emissions estimated for the RMPPA (Tables A4-5 through A4-7 in Appendix 4) are much higher than the Wyoming State-wide 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 State-wide 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, BLM concludes that increases in concentrations of carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), PM_{10}, and $PM_{2.5}$ in the RMPPA would not cause any exceedance 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 the Desolation Flats project (BLM 2003b) estimate potential impacts to visibility, emissions described in Section 4.2

might contribute to significant impacts to visibility (Table 4-8). The sources modeled for Desolation Flats have some similarities to the Rawlins RMPPA analysis.

Table 4-8. 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 – PM_{10} concentrations .002-.4% of increments – NO_2 concentration .4% of increment – SO_2 concentration .005–.07% of increments
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 very sensitive lakes – 46% of LAC for Upper Frozen Lake – 32% of LAC for Pothole A-8 – 32% of LAC for Upper Slide Lake

It would be inappropriate to infer RMPPA impacts directly from impacts estimated for the Desolation Flats project as a result of differences in such components as emission inventories. However, results of the quantitative analysis using modeling performed for the Desolation Flats EIS suggest that RMPPA activities could contribute to significant impact 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 Forest Service voluntary guideline (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.

BLM has chosen to describe potential air quality impacts in the Rawlins Resource Management Plan qualitatively. In the near future (about 2006), 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 portions of adjacent viewsheds (maximum of 5 miles) of national historic trails that extend outside the RMPPA. This CIAA was identified because cultural resource management actions are specific to activities that would detract from the visual quality. Effects to cultural resources within the RMPPA are presented in Section 4.3 above.

Potential impacts to cultural resources would result primarily from surface disturbing and disruptive activities (within and outside the RMPPA) that result in erosion or vibration from traffic and/or machinery, soil compaction, and landscape alteration. However, impacts to cultural resources would usually be mitigated by legal protections afforded to them through restrictions on surface disturbing and disruptive activities, and through consultation processes with the State Historic Preservation Officer (SHPO) and with Native American tribal representatives. Vegetation treatments would benefit cultural resources in the long term by improving diversity of the vegetative community, soil stability, and therefore reducing erosion. However, short-term impacts to cultural resources would increase from vegetation removal and increase potential for soil erosion.

The majority of cumulative effects on cultural resources would also result from surface disturbing and disruptive activities on private, state, and other federal lands from mineral development and associated wells, roads, pipelines and facilities. In addition, livestock grazing improvements and dispersed recreation would impact cultural resources. Portions of each historic trail's physical integrity could also be affected by improved accessibility that result from increased oil and gas activity. However, it is anticipated that impacts to historic trails would be less than significant as a result of the protections afforded these resources by the NHPA.

Oil and gas development would cause the greatest amount of impact to cultural resources from construction of roads, pipelines, and well pads. Unanticipated subsurface discoveries (cultural resources discovered during project construction activities) occasionally occur from surface disturbing and disruptive actions. Unanticipated discoveries result in the irretrievable loss of some or occasionally all of the cultural resource involved. This potential loss would continue to occur under all the alternatives.

Impacts that occur on nonfederal lands with no federal involvement will continue to occur within the RMPPA. These development actions result in the damage or loss of some cultural resources through surface disturbing and disruptive or other construction activities. In addition, surface disturbing and disruptive activities that occur on properties adjacent to federal lands, especially within the checkerboard

landownership areas, potentially introduce visual intrusions to those sites where the setting contributes to the NRHP eligibility. This has resulted in a cumulative loss of the integrity of the setting of these sites and a fragmentation of larger sites such as the historic trails.

Under Alternatives 1 and 4, 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 any other alternative.

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.

Potential impacts to paleontological resources would result from surface disturbing and disruptive actions. Under all RMP alternatives, impacts to paleontological resources would not be considered significant because of the policies associated with the paleontological resource management program, which require identification and mitigation of paleontological resources before surface disturbing and disruptive activities.

Activities such as vegetation treatments, habitat enhancements, and oil and gas development activity on private and state lands would likely result in significant impacts to paleontological resources attributed to a lack of legal protections afforded these resources and the amount of acreage these lands occupy within the RMPPA (about 5,310,000 acres or 47 percent of the RMPPA). These activities would increase the potential for surface disturbing and disruptive activities from traffic or machinery, soil compaction, erosion, and landscape alteration causing substantial direct and indirect damage or destruction to potentially important paleontological resources.

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 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.

Because of the protections afforded paleontological resources, there are no substantial differences in the potential of cumulative impacts under any of the RMP alternatives.

Fire Management

The CIAA used to analyze cumulative impacts regarding fire management is limited to the RMPPA. As a result of noncontinuous fuels, low historic fire incidence, and significant fuel breaks (e.g., highways, farmland, 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.

Potential impacts to fire management would result primarily from restrictions placed on vegetative treatments that would limit the reintroduction of wildland fire into fire-dependent ecosystems. Additional impacts would result from the spread of noxious and invasive weeds, and the dominance of older seral stages of vegetative communities. This is especially true near WUI areas.

Cumulative impacts on fire management would also result from increased development activities occurring within the RMPPA. As mineral development and other construction activities such as recreation facilities and urban development increase throughout the RMPPA, so do the potential for wildfire occurrence and the need for fire suppression activities. In addition, as increased development and associated infrastructure (e.g., power lines, compressors, pipelines, fuel tanks) occurs within the RMPPA, a corresponding need for increased fire suppression will also be needed within WUIs.

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 wildfires and wildland-urban interface situations, thereby minimizing potential cumulative impacts on fire management.

Forest Management

The CIAA used to analyze cumulative impacts regarding forest management includes the entire RMPPA, including USFS within and intersecting the RMPPA (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.

Potential impacts to forest management would result primarily from surface disturbing and disruptive activities. Under all RMP alternatives, impacts to forest management would not be considered significant. However, varying degrees of disturbance would occur depending on the level of development projected for each alternative. Land use restrictions and VRM classification would also impact forest management' however, the effects are not considered to be significant.

Resource development impacts on forestland might result from the removal of forested surface for roads and other surface infrastructure. Such activities would result in lands being removed from potential timber harvest production for the life of the mining. These impacts would be similar for leasable, locatable, and common variety minerals. However, such forms of mineral development are predominately located in nonforested to lightly forested areas of the RMPPA. Mineral resource development activity can also benefit forest management by providing opportunities for increased accessibility to potential harvest or management areas. The recommendation of 27,963 acres for wilderness designation within Huston Park and Encampment River Wilderness Areas would impact forest management by removing these areas from timber harvest production.

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. 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 reality 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 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 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 NSO areas and listed as avoidance or exclusion areas for ROWs.

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.

Potential cumulative impacts to livestock grazing operations would occur from a combination of activities and land uses occurring within the CIAA. Such impacts would result primarily from surface disturbing and disruptive activities, human disturbance, and the presence of grazing wildlife and wild horses. These activities result in livestock displacement and direct removal and indirect degradation of forage. Reclamation efforts and vegetation treatments would reduce impacts 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 areas, 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 in a reduction in available forage and AUMs. Impacts would be greater in areas with large populations of big game and wild horses. These impacts could result in substantial rangeland degradation and thereby jeopardize compliance with the Standards for Healthy Rangelands (BLM 1997) on some allotments. If livestock grazing is considered to be a factor in violating the standards, the responsible livestock operator might be required to alter grazing practices.

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. 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 (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.

Cumulative impacts to livestock grazing operations would be considered significant under Alternatives 1, 3, and 4 because of substantial forage removal and/or 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 flexibility in livestock management under Alternative 2. Under Alternative 1, surface disturbing and disruptive activities and other uses combined with minimal efforts to control noxious and invasive weeds would result in a loss of AUMs. 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. Under Alternative 4, surface disturbing and disruptive activities and other uses combined with an increase in the number of wild horses allowed in the Lost Creek HMA would cause a loss of 2,445 permitted winter sheep AUMs.

Minerals Management

The CIAA for minerals management is composed of the RMPPA area because activities and resources occurring within the RMPPA are not expected to affect mineral resources outside the RMPPA. Effects to mineral management on public lands administered by BLM within the RMPPA are described above in Section 4.8.

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, withdrawal lands from locatable mineral entry, and close areas to salable minerals development. None of the RMP alternatives would result in significant impacts to mineral resources.

As detailed in Table 1-1, about 1,011,230 acres of federal mineral estate will not be covered by RMP decisions as a result of management of the land surface by other federal agencies such as the USFS, Bureau of Reclamation, 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, have no known oil and gas potential, or require site-specific analysis. Surface use restrictions on lands available for lease within the forest include NSO, controlled surface use, and timing limitations similar to those of BLM. Although these restrictions are in place on 27 percent of the forest and the remainder of USFS lands are either designated wilderness or require site-specific analysis, minimal cumulative effects on mineral resources and development are expected because the majority of the land within the forest area has low to no potential and is still available for development.

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, no cumulative effects to mineral resources or development are expected from these lands as a result of the case-by-case nature in which BLM coordinates with other federal agencies for use of its federal mineral estate.

Another 1,247,130 acres of private and state land containing federal mineral estate is covered by RMP decisions; however, decisions are included for the federal mineral estate only, and surface land and resource uses and values are still under the jurisdiction of private and state entities. No cumulative effects to mineral resources or development are expected on these lands because BLM will coordinate with private and state entities on a case-by-case basis for use of its federal mineral estate.

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. This level of mineral resource development might increase from well numbers projected in the RFD as a result of BLM's ability to develop its federal mineral estate on lands with other federal agency surface use jurisdiction; however, well projections are unknown as a result of the case-by-case nature in which BLM coordinates with these agencies. Given this consideration, 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.

The projects and activities considered are not anticipated to cause a substantial reduction in the development of locatable and common variety minerals or cause the costs of development and extraction to escalate to the point where the economics of mineral development would be marginal. Therefore, no cumulatively significant impacts to coal, locatable, or common variety minerals are anticipated.

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 actions. These impacts would primarily result from oil and gas development that would detract from certain types of recreational experiences through increased roads, industrial traffic, noise, and scenery degradation associated with industrial development. Short-term impacts would result from vegetation treatment by creating temporary closures and displacing recreational users from denuded areas. However, vegetation treatment would improve range condition, aesthetics and wildlife habitat in the long-term resulting in recreational benefits.

Cumulative impacts to recreation would potentially occur as a result of increased recreational demand and from a mixture of land uses that result in conflicts for unconfined dispersed recreational opportunities. Such impacts are a result of increased recreational activity occurring within and outside the RMPPA and because of conflicts generated from approved developments. Development activities would alter recreational settings, resulting in the degradation of some recreational experiences, caused by increased visual impacts, noise, and concerns of public health and safety. In areas in which development occurs, some hunting opportunities could also be diminished as a result of the displacement or loss of game animals. Development and restrictions could reduce recreational opportunities for some users by limiting certain types of recreational activities; however, the same restrictions, such as road closures, could also enhance the experience of other recreationalists seeking solitude or primitive opportunities.

Under Alternative 2, cumulative impacts on recreation would increase because of increased development activities and fewer restrictions placed on sensitive resources. Cumulative impacts on recreation would also increase under Alternative 2 in regard to public health and safety concerns as a result of additional roads and associated conflicts between users. Indirect significant cumulative impacts to recreation would potentially occur because of reduction in, or substantial impacts to, wildlife habitat creating a long-term reduction in recreation opportunities. Under Alternative 3, impacts on recreation would be less than those of Alternative 2 because of less development activities, increased land resource protections, and decreases in oil and gas development. Most of the identified impacts under Alternative 3 would benefit recreation management and primitive types of recreation.

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 4.9 above.

Potential impacts to OHV use would result primarily from resource development occurring within the RMPPA, which increases the amount of roads available for OHV use. However, this could also result in the generation of additional roads in areas that previously had only primitive vehicle routes in open country, which are preferred to improved roads by many OHV users. Possible long-term significant impacts would result from conflicts between commercial and OHV use of these roads. Potential short- and long-term impacts to OHV use would also occur from land use restrictions within the RMPPA established to protect sensitive resources.

The majority of cumulative effects on OHV use within the CIAA would also result from surface disturbing and disruptive activities on private, state, and other federal lands that eliminate, reduce, or alter opportunities for OHV use or compromise public health and safety. Oil and gas development would cause the greatest amount of effects on OHVs through the addition of roads within the CIAA. In addition to roads other impacts from surface disturbing and disruptive activities include the construction of pipelines, towers, fences, transmission lines, and communication sites. 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 from riparian management and wildlife conservation plans.

Under all RMP alternatives, the potential for cumulative impacts to OHV management would be similar because of similarities in management prescriptions between alternatives (open to OHV use or restricted to roads and vehicle routes). The greatest potential for cumulative impacts to OHV management would occur under Alternative 2 because of increased surface disturbance activities generating more improved roads. Under Alternative 3, impacts to OHV management would increase because of greater amounts of the RMPPA having OHV use restrictions.

Socioeconomic

The CIROI boundary for socioeconomics extends beyond the RMPPA and is made up of Albany, Laramie, Carbon, and Sweetwater counties. The effects of BLM actions on Albany, Carbon, Laramie, and Sweetwater socioeconomics within these counties is presented in Section 4.12 above.

The greatest potential for cumulative socioeconomic impacts is associated with oil and gas development throughout the Southwest Wyoming on federal, state, and public lands. For instance, the impacts of oil and gas development for the RMPPA discussed above considered only those directly tied to activities on federal lands with the field office. However, 55 percent of the potential drilling locations are located on

state and private lands. Analysis of the cumulative impacts of all potential oil and gas activities within the RMPPA region is summarized in Table 4-9.

Table 4-9. Cumulative Economic Impacts of Oil and Gas Development Within the RMPPA

Alternatives /Activities	Net Present Value 2004-2023 (7%)			Employment	
	Average Wells Drilled Per Year/Annual Value of Production	Mineral Tax Revenues	Total Earnings	Average Jobs Supported Per Year	Average Earnings Per Job
Preferred Alternative—Federal					
Oil and Gas Drilling	189		$751,536,828	1,552	$31,384
Oil and Gas Production	$9,012,715,994	$2,038,594,925	$521,288,628	1,332	$37,985
Total Impacts			$1,272,825,457	2,884	$34,684
Preferred Alternative—State and Private					
Oil and Gas Drilling	250		$658,905,199	1,982	$31,385
Oil and Gas Production	$10,791,278,574	$1,340,664,386	$624,159,333	1,595	$37,985
Total Impacts			$1,283,064,533	3,576	$34,685
Preferred Alternative—Cumulative Impacts					
Oil and Gas Drilling	438		$1,410,442,027	3,534	$33,960
Oil and Gas Production	$19,803,994,568	$3,379,259,310	$1,145,447,962	2,927	$37,985
Total Impacts			$2,555,889,989	6,461	$35,972

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As shown in Table 4-9, expected oil and gas activity within the RMPPA will increase mineral tax revenues, total earnings, and employment. If oil and gas development occurs at expected rates within the RMPPA and throughout southwest Wyoming, it is likely that significant socioeconomic impacts will occur. The pace and timing of mineral development activities is dependent on various factors beyond the management decisions of BLM, including national and international energy demand and prices, production factors within the RMPPA and business strategies of operators. Because the pace of development in the RMPPA is unknown, actual cumulative impacts might vary if the rate of production changes during the study period.

Potential socioeconomic impacts include changes in employment and income; changes in tax revenue to local, state, and federal government entities; and changes in demand for housing and government services. Because of the temporary nature of oil and gas activities, it is also likely that some communities within the study area will be affected by the “boom and bust” cycle. This can often cause hardships for areas that must improve or expand infrastructure for large, temporary increases in population.

Many of the cumulative socioeconomic impacts associated with oil and gas development are already occurring in the region and would be perpetuated in the future with increased oil and gas development. For instance, increased development is generating employment opportunities in Southwest Wyoming, and it is likely that individuals from outside the area will fill a percentage of those jobs in the future. This is because a recent increase in natural gas drilling activity throughout Wyoming and the region has caused the demand for skilled workers to exceed supply. Consequently, it is likely that changes in population will occur in certain parts of the study area as a result of oil and gas development.

Increasing employment from oil and gas development throughout Southwestern Wyoming is likely to impact communities such as Rock Springs and Rawlins as a result of the concentration of oil and gas services companies in these two communities. These larger communities tend to have excess capacity in infrastructure to absorb significant increases in population. For instance, development activities, like those expected throughout Southwest Wyoming would help to reverse the losses in population in the late 1990s. Other communities and unincorporated areas might also be impacted as new individuals move into the area and might not be able to fully absorb changes in population as it occurs. If these increases occur in the short term, smaller communities might realize impacts of a boom and bust cycle associated with mineral development activities. This can significantly impact the demand for government services, which can be overutilized or underutilized during these cycles.

Increased oil and gas development throughout the region is expected to provide positive benefits to local governments in the form of increased mineral tax revenues. 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.

In addition, these overall socioeconomic effects could alter the attitudes and opinions of local area residents. This includes increases in existing conflicts between conservation minded individuals and groups and the pro-development community. 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. These attitudes and opinions would generally remain the same. Consequently, some local residents will support further development activities, whereas others will be dissatisfied if development activities were to reduce hunting opportunities or degrades recreational activities. In addition, others might be dissatisfied if areas within the RMPPA are not left in an undisturbed state.

Increased oil and gas development throughout the region would likely cause a change in population trends in the western portion of the study area. This will likely cause impacts to custom and culture as some areas are “industrialized” to support more oil and gas operations. Communities such as Rock Springs and Rawlins, which have developed around mineral extraction industries, would likely support these activities. However, other communities that have been more agriculturally based would experience changes in custom and culture as population changes to support this alternative activity. Population changes will likely bring new individuals to the area that 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 Management Areas

The CIAA boundary for SMAs includes the entire RMPPA because activities and resources occurring outside the RMPPA are not expected to affect SMA 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 SMAs 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 as an SMA is adequate to protect relevant and important values.

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 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 SMAs 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.

SMAs designated for the management of wildlife, including Wildlife Habitat Management Areas, 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 SMA.

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 SMAs. Cumulative impacts could include degradation of visual resources, soils, watershed resources, and vegetation caused by these development activities within and surrounding these SMAs. 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 SMA, 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 SMAs under these alternatives and the least amount of projected development activities. Adverse cumulative effects would be the greatest under Alternative 2 because it removes SMA designations on three SMAs within the RMPPA and allows the greatest amount of development activities with the least amount of restrictions.

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 primarily from surface disturbing and disruptive actions. Under all RMP alternatives, impacts to these communities would not be considered

significant; however, varying degrees of disturbance would occur depending on the level of development activity projected for each alternative. Such disturbances as roads and operational pads could potentially exist throughout the planning period; however, reclamation efforts would greatly reduce impacts to vegetation communities.

The majority of cumulative effects on vegetation within the CIAA would also result from surface disturbing and disruptive activities on private, state, and other federal lands that remove vegetation such as mineral development and associated wells, roads, pipelines, and facilities, livestock grazing improvements, and dispersed recreation. Vegetation treatments in the form of prescribed burns might also affect vegetative resources; however, those treatments proposed by WGFD would be for the benefit of wildlife (and thus likely vegetation). All effects would depend on the amount and timing of activities and whether the amount of activity within the CIAA outpaces the success of reclamation and revegetation efforts in disturbed areas, if reclamation efforts are initiated. Impacts are not likely to be significant because of the varied spacing of activities and reclamation and revegetation efforts. However, they are likely to be long term, even with successful reclamation, because most of the native shrub communities (e.g., sagebrush) that would be impacted require in excess of 20 years to reestablish to predisturbance conditions.

Oil and gas development would cause the greatest amount of effects to vegetation resources through removal of vegetation by construction of roads, pipelines, and well pads. Areas of intense development would cause more severe localized impacts to vegetative resources. Overall, the amount of disturbance is negligible compared with the amount of total vegetative resources within the CIAA because the majority of affected vegetation types are common and widely distributed throughout the region. Reclamation of construction impacts in areas not needed for long-term operation (i.e., roads and operational pads) and of abandoned well sites and roads would begin to increase during the planning period leading to some reduction of overall disturbance. The implementation of BLM's Mitigation Guidelines, restrictions on surface use, continued implementation of Standards for Healthy Rangelands (BLM 1997) and desired plant community objectives, and monitoring efforts would provide protection to vegetative resources on federal lands, and possibly lands with federal subsurface minerals, and help reduce overall effects. Special status plants species, under the ESA and Wyoming BLM sensitive species guidance, would be protected on federal lands by site-specific mitigation including exclusion or avoidance of all surface disturbing and disruptive activities; however, protection of these species on private and state lands might not occur, resulting in potentially significant impacts to these species.

Effects on vegetation from livestock grazing improvements or other possible surface disturbing and disruptive activities are considered minor compared with those of oil and gas development and would therefore only result in localized, short-term adverse effects to vegetative resources. Effects from vegetation treatments in the form of prescribed burns 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 and multiseral plan community.

The differences in the projected amount of surface disturbance among the RMP alternatives (about 7,160 acres) do not affect the overall analysis of cumulative effects on vegetative resources within the CIAA.

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 for ROWs under the lands and realty program. Impacts would be lessened under all other alternatives because of fewer restrictions on seasonal access and road development.

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.

Potential impacts to VRM would result primarily from surface disturbance activities that would cause visual intrusions not consistent with VRM designation. Impacts from vegetation treatments and fire management also pose potential impacts to visual resource management; however, if effectively mitigated, restoration efforts would greatly reduce these impacts resulting in only short-term impacts.

The majority of cumulative effects on visual resources would also result from surface disturbance activities. Potential cumulative actions that could affect visual resource management include oil and gas development, wind energy projects, power and pipeline projects, and communication towers. Actions on private lands and in the checkerboard and intermixed land ownership areas could also potentially result in cumulative visual impacts to VRM classifications because of BLMs lack of authority on these lands.

Under Alternative 3 and 4, the greatest potential for cumulative impacts to visual resources exists because of increased designations of VRM Class II and because of greater emphasis being placed on cultural resources. The potential for cumulative impacts on VRM under Alternative 2 increases because of development opportunities, however, because the majority of the RMPPA is designated as Class III and IV under this alternative, impacts from development would not be significant.

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: Water Quality and Depletions 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 draft 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. Cumulative impacts would occur from all activities that disturb soils; remove vegetation; and cause soil compaction or channel overland flows, such as road and well pad construction, livestock trampling, and recreational use. Such disturbances result in accelerated soil erosion and runoff, which increase sediment, salt, and nutrient loads to local channels and lead to channel destabilization.

Conventional oil and gas and CBNG development activities would be the primary cause of surface disturbance and related impacts to soil resources, water quality, and watershed health. Increases in these activities combined with increases in recreation and continuation existing livestock grazing practices would in some locations degrade water quality beyond the designated use of receiving water bodies, thereby resulting in significant impacts. Appropriate mitigation and project design during site-specific analysis could minimize offsite sedimentation, but would be dependent on design and maintenance. 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 and disruptive 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. Although existing and future activities on these lands is not well known, it is assumed that surface disturbing and disruptive activities (e.g., mineral development and general construction) would occur. However, private landowners are not required to implement the same level of mitigation and protection measures as BLM, which could increase impacts to soils and watershed resources. Specifically, discharging produced waters into ephemeral drainages or not adequately considering water treatment options in the North Platte or White-Yampa subregions could result in significant impacts.

Mineral development activities and construction of livestock water developments would deplete water from the Colorado River and Platte River drainages. Recovery programs or interagency agreements designed to protect endangered and/or threatened species outside the RMPPA would mitigate this. These depletions would change the nature of flows, which could alter stream dynamics and cause overall degradation of the riparian corridor. Furthermore, wildlife and fish species not identified under ESA for protection could be impacted by changes in flow in these systems.

Impacts to groundwater quality would depend on the quality and maintenance of wells and the overall level of activity. 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 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. 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 will be used to evaluate this potential, and decisions will be made to protect surface waters as appropriate.

Impacts from surface disturbing and disruptive activities, water developments, and surface discharges from CBNG development would result in degradation of water quality beyond the designated use of receiving water bodies in the White-Yampa subregion and potentially in the North Platte subregion (depending on development strategies). These significant impacts would occur under all alternatives. Impacts from all surface disturbing and disruptive activities would result in significant impacts to soils under all alternatives because soil loss (locally and regionally) would exceed natural levels by more than 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 under Alternative 1 and 2 and more impacts than under Alternative 3. This is attributed to surface disturbing and disruptive activities and water disposal alternatives.

Wild Horses

The CIAA used to analyze cumulative impacts on wild horses includes the HMAs within the RMPPA and those HMA's that are adjacent to and comprise the meta-populations of RFO (Map 4-2). The HMAs included in the CIAA that makeup 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 also increase human presence (e.g., recreation and increased travel) would also cause impacts to wild horses.

The majority of cumulative effects on wild horses within the CIAA would also result from surface disturbing and disruptive activities on private, state, and other 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 adaptability of wild horses and the small amount of vegetation actually removed by development activities. Impacts stemming from competition with livestock and wildlife over forage and water resources are expected to be mitigated by the Standards for Healthy Rangelands (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 and could be easily mitigated. Impacts would be significant in portions of the Adobe Town HMA and would require reevaluation of the suitability of those portions 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.

Wildlife and Fish

CIAAs for effects to wildlife and fish vary by species. The CIAAs for big horn sheep, elk, mule deer, and pronghorn are composed of the HMAs for each species that either falls 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 all composed of the RMPPA. Effects of BLM actions on wildlife and fish administered by BLM within the RMPPA are presented in 4.19 above.

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 minerals development, OHV use, and livestock grazing that could result in the loss, alteration, and fragmentation of habitats and displacement of wildlife. Alternative 2 would result in the greatest effects to wildlife attributed to the greatest amount of development with the least amount of protections. Alternative 3 would result in the least impacts attributed to the least amount of development and the greatest level of protection.

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 and grazing improvements and others (e.g., geophysical exploration) on private, state, and other federal lands within the RMPPA. Effects could result in habitat fragmentation and animal displacement (short term or long term), depending on the amount, location, and timing of activities. Vegetation treatments in the form of prescribed burns might also affect wildlife resources, particularly Greater sage-grouse. 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 and could result in increasing 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, birthing, nesting, and early rearing of young). Impacts to wildlife could be potentially significant if activities are concentrated in areas of sensitive wildlife habitat, and/or increased development and surface disturbance alter existing migration corridors to the extent that access to important habitat areas is greatly reduced.

Effects from vegetation treatments in the form of prescribed burns would include a short-term increase of early successional species and a short-term decrease in vegetation production. Long-term effects, however, would benefit most wildlife through an increase in grass species and vegetation production from conversion of high-density sagebrush to sagebrush/grass communities.

Big Horn Sheep

Approximately 40,120 acres of big horn crucial winter range and 920 acres of parturition area are present on private and state lands (with federal mineral estate) within the RMPPA. Additional big horn crucial winter range and parturition areas are located on private and state lands (without federal mineral estate) and USFS lands; however, acreages are unknown at present. Potential significant effects to these habitats from activities on these lands would be likely because they are not afforded the same protections as habitat on BLM lands.

Elk

Approximately 287,550 acres of elk crucial winter range and 21,370 acres of elk parturition area are present on private and state lands (with federal mineral estate) within the RMPPA. Additional elk crucial winter range and parturition areas are located on private and state lands (without federal mineral estates) and USFS lands; however, acreages are unknown at present. Crucial winter range and birthing habitat are important areas to the viability of the elk herds. Persistent disturbance in elk sensitive habitats shifts the areas of use, weakens the tendency of elk to return to the disturbed area, and results in selection of habitat with equal or more marginal quality and security occurs. If animals return to disturbed habitat, populations can be lower and use of the habitat can be unpredictable.

Potential significant effects to these habitats from activities on these 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 Wildlife Habitat Management Areas 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; however, the majority of these corridors are located in areas of existing long-term disturbance (such as I-80) so minimal additional impacts would occur.

Pronghorn

Approximately 653,070 acres of pronghorn crucial winter range is present on private and state lands (with federal mineral estate) within the RMPPA. Additional pronghorn crucial winter range is located on private and state lands (without federal mineral estates); however, acreages are unknown at present.

Although few published studies exist on pronghorn antelope reactions to roads and/or disruptive human activities, roads, fences, and pipelines are known to fragment habitat and can impede or block antelope movement. The density of which these occur could have a large effect on antelope migration and use of habitat. Mineral development would cause the greatest amount of effects to pronghorn antelope through habitat fragmentation by the proliferation of roads, pipelines, and wells. Road proliferation would continue to occur with oil and gas projects on all lands in antelope habitat, which would potentially reduce or eliminate migration corridors throughout antelope crucial winter range in the CIAA. Depending on the timing of activities and location of surface disturbance within the CIAA, the potential exists for disruption of crucial winter range continuity and migration corridors between key habitats. This would likely affect pronghorn antelope populations; however, it is unknown whether effects would be significant given the lack of information on pronghorn reactions to human activity.

Mule Deer

Approximately 540,200 acres of mule deer crucial winter range is present on private and state lands (with federal mineral estate) within the RMPPA. Additional mule deer crucial winter range is located on private and state lands (without federal mineral estates); however, acreages are unknown at present.

Mineral development would cause the greatest amount of effects to mule deer habitats on all lands within the CIAA through direct loss of habitat and animal displacement. Depending on the timing of activities and location of surface disturbance within the CIAA, the potential exists for disruption of crucial winter range continuity and migration corridors between key habitats. This would likely affect pronghorn antelope populations; however, it is unknown whether effects would be significant.

4.21 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Section 102(2)C or NEPA requires a discussion of any irreversible or irretrievable commitments of resources, which would be involved in the proposal should it be implemented. An irretrievable commitment of a resource is one in which the resource or its use is lost for a time period (e.g., extraction of any locatable mineral ore or oil and gas). An irreversible commitment of a resource is one that cannot be reversed (e.g., the extinction of a species or disturbance to protected cultural resources).

Implementation of the RMP would result in an irreversible or irretrievable commitment of resources. This would be from surface disturbing and disruptive activities associated with mineral extraction and energy development permanently altering soil and damaging cultural and paleontological resources. Slight increases in sediment, salinity, and nonpoint source pollution might result in an irretrievable degradation of water quality from these activities. Wildlife dependent on the affected habitats might be displaced and populations might be reduced as carrying capacity of the range is reduced. Irreversible and irretrievable losses of wildlife habitat indirectly reduce the amount of suitable Special Status Species habitat. However, management prescriptions and mitigation prescribed under the 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, particularly near communities. Stand-replacing fires might cause an irreversible loss to some key ecosystem components.

An irretrievable commitment of nonrenewable fossil fuels (i.e., oil, gas, and coal) would occur from extraction of potential wells developed during the next 20 years (Alternative 1, 8,945; Alternative 2, 9,198; Alternative 3, 8,632; and Alternative 4, 8,822). Mineral and energy development would result in an irreversible loss of vegetation resources and crucial mule deer, elk, big horn sheep, and pronghorn habitat within minerals and energy development categories as development occurs. Lands occupied by mineral extraction would permanently lose habitat values and reduce carrying capacity for wildlife resources.

4.22 UNAVOIDABLE ADVERSE IMPACTS

Section 102(C) of NEPA requires disclosure of any adverse environmental effects that cannot be avoided should the proposal be implemented. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which no mitigation measures exist. Some unavoidable adverse impacts would occur as a result of implementing 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 mandate would result in unavoidable adverse impacts. Although these impacts are mitigated to the extent possible, unavoidable damage is inevitable. Permanent conversion of vegetation resources to other uses such as transportation and mineral and energy development reduces the quantity of vegetation resources. Energy and mineral resources extraction on public lands potentially creates visual intrusions, soil erosion, and compaction problems. Portions of the resource area with more intense recreational use would continue to experience scarring, increased soil erosion, and loss of vegetation. Although these impacts are unavoidable, they are concentrated in areas already disturbed, which reduce the spread of impacts to more remote or less frequented areas.

Because large portions of the crucial big game habitats coincide with the known areas of oil and gas potential, impacts to habitats would be unavoidable under current BLM policy to foster oil and gas

development. However, permanent oil and gas well sites and their associated infrastructure would be mitigated to the extent possible to minimize fragmentation and avoid the most significant wildlife habitat values. Competition is anticipated for habitat resources between wildlife, livestock, and wild horses and burros. The extent of the impacts would vary by season and drought cycle. Although there might be short-term periods of significant impacts, long-term management will ensure that these uses are compatible to the extent possible.

Inadvertent damage to or loss of cultural resources from increased visitation and 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 user types, such as recreationists who seek more primitive types of recreation and motorized vehicle users who share recreational areas, are unavoidable adverse impacts. As recreation demand increases, recreational use would disperse to other areas of the RMPPA, which could create conflicts with previous uses of those areas. Under alternatives in which mineral development is expected to be higher, recreation use would be transferred from those areas, which will increase the extent and frequency of conflict between these incompatible user groups.

Numerous land use restrictions imposed throughout the RMPPA to protect sensitive resources and other important values, by their nature, would impact 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 the protection 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" is defined as anticipated to occur within 1 to 5 years of implementation of the activity. "Long term" is defined as following the first 5 years of implementation but within the life of the RMP (projected to be 20 years).

Management actions would result in various short-term effects, such as increased localized soil erosion, fugitive dust emissions, vegetation damage, and decreased visual resource quality. Surface disturbing and disruptive activities, including mineral and energy development, dispersed recreation, livestock grazing, infrastructure development, and human use would result in the greatest potential for impacts to long-term productivity. Management actions and best management practices minimize the effect of short-term uses and reverse the change during the long term. However, BLM lands are managed to foster multiple uses and some long-term productivity impacts might occur regardless of management approach.

The short-term effects of oil and gas development decrease the area and productivity of potential crucial deer and elk and Special Status Species habitats. Development of additional roads associated with oil and gas development would cause the greatest impacts. However, permanent oil and gas well sites and their associated infrastructure would be mitigated to the extent possible to minimize fragmentation and avoid the most significant wildlife habitat values. In addition, management actions to improve soil, water, riparian, vegetation, and habitat resources would improve the productivity of wildlife and Special Status Species habitats throughout the RMPPA.

Long-term impacts to soil structure and vegetation would occur in areas where concentrated recreational use is directed. However, concentrating recreational use to certain areas would limit the adverse impacts from extending to other areas of the RMPPA. Maximizing short-term use of forage resources without an increase in woodland harvest or vegetation treatments would result in a long-term continued build-up of large fuels, which would result in uncharacteristically intense wildland fires and longer return-fire intervals. However, increases in short-term woodland product harvest (e.g., pole/post, dead and down fuel collection) as well as forest harvests would reduce the long-term intensity and size of wildland fires.