Appendix CC

Forest Service Biological Evaluation and Wildlife Specialist Report

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Biological Evaluation and Wildlife Specialist Report

for the

Greater Sage-Grouse Land Use Plan Amendment for the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Salmon-Challis, and Sawtooth National Forest Plans and the Curlew National Grassland Plan

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ACRONYMS

ACEC	area of critical environmental concern
BLM	Bureau of Land Management
BMP	best management practice
COT	Conservation Objectives Team
CHZ	core habitat zone
db	decibel
EIS	environmental impact statement
FEIS	final environmental impact statement
FSM	Forest Service Manual
GHMA	general habitat management areas
GHZ	general habitat zone
GRSG	Greater Sage-Grouse
IM	Instruction Memorandum
IHMA	important habitat management area
IHZ	important habitat zone
kV	kilovolt
LUP	land use plan
LUPA	land use plan amendment
MZ	Management Zone
MIS	Management Indicator Species
NEPA	National Environmental Policy Act
NTT	National Technical Team
NSO	no surface occupancy
PHMA	priority habitat management area
RDF	required design feature
ROW	right-of-way
SFA	sagebrush focal area
SAS	sagebrush-associated species
SUA	special use authorization
USFWS	United States Fish and Wildlife Service
UDWR	Utah Division of Wildlife Resources
WAFWA	Western Association of Fish and Wildlife Agencies

INTRODUCTION

The purpose of this report is to identify the likely effects of the Greater Sage-Grouse (GRSG) Land Use Plan Amendment (LUPA) for the Caribou-Targhee, Beaverhead-Deerlodge, Boise, Salmon-Challis, and Sawtooth National Forests and the Curlew National Grassland. Specifically, the effects it would have on Forest Service Region 4 sensitive species and management indicator species (MIS) on National Forest System lands in the Idaho and Southwestern Montana Sub-region.

Sensitive species for Region 4 are listed on the Regional Forester's sensitive species list and comprise plants, birds, mammals, amphibians, and fish. The National Forest Management Act directs National Forests to identify MIS based on five criteria (36 CFR 219.19 (a)(1)) that include endangered and threatened plant and animal species identified on State and Federal lists; species commonly hunted, fished, or trapped; non-game species of special interest; species with special habitat needs that may be influenced significantly by planned management programs; additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.MIS are often selected because they are sensitive to habitat changes. By monitoring and assessing populations of MIS, managers examine the outcome of implementing land management plans. This report contains sections on the project history, purpose and need, description of the alternatives, and description of the analysis area, followed by the biological evaluation for Region 4 sensitive species and the report for MIS species in the analysis area. Species listed as threatened or endangered by the US Fish and Wildlife Service (USFWS) are addressed in the biological assessment prepared for this project.

PROJECT HISTORY

GRSG has emerged as a significant conservation concern over the last 10 years. The species is a candidate species for listing under the Endangered Species Act, implying that listing is "warranted, but precluded due to higher priorities" because of two primary factors: the large-scale loss and fragmentation of habitats across the species range and a lack of regulatory mechanisms in place to ensure the conservation of the species.

The primary threats to GRSG habitat are summarized in the listing decision. The two dominant threats are related to infrastructure associated with energy development in the eastern portion of the species' range and the conversion of sagebrush communities to annual grasslands, resulting in large uncharacteristic wildfires in the western portion of the species range (USFWS 2010).

The Bureau of Land Management (BLM) manages approximately half of the GRSG habitats, whereas the Forest Service manages approximately 8 percent of species habitat in the western US, most of which is on national forests in the Intermountain Region. The Forest Service manages approximately 9 million acres of sagebrush habitats, about 7.5 million acres of which is in the Intermountain Region. Most habitats on Forest Service-administered lands contribute to summer GRSG brood-rearing habitats, although some forests and grasslands do contribute important breeding, nesting, and winter habitat.

In 2011 and 2012, the USFWS submitted letters to the BLM and Forest Service recommending

that the agencies amend land management plans to provide adequate regulatory mechanisms to conserve the species. Originally, this recommendation identified 10 National Forests viewed as high priority to ensure appropriate regulatory mechanisms to conserve the species. Following scoping and discussion, the Forest Service added an additional 10 forest plans that would be considered for amendment. The Forest Service is participating in several joint environmental impact statements (EISs) with the BLM to develop records of decision that will be used as a basis for amending land management plans, including Forest Plans (http://fsweb.r4.fs.fed.us/unit/nr/sagegrouse/index.shtml).

Because the BLM manages most occupied GRSG habitat remaining on federal lands, that agency is leading the effort to amend or revise land management plans, with the Forest Service as a cooperating agency. The purpose is to provide direction in land management plans that conserve and protect GRSG habitat and to provide assurances to the USFWS that adequate regulatory mechanisms are in place to ensure the conservation of the species.

EISs will be completed for seven GRSG planning sub-regions: eastern Montana and portions of North and South Dakota, Idaho and southwest Montana, Oregon, Wyoming, northwest Colorado, Utah, and Nevada and northern California. The Forest Service is participating in six of these EISs (excluding eastern Montana and the Dakotas and some of the areas in Wyoming). The EISs will include joint agency signatures, but separate records of decision.

This biological evaluation and wildlife specialist report is prepared to address National Forest System-administered lands in support of the Idaho and Southwestern Montana Sub-regional GRSG EIS. All managers of National Forests covered by that EIS are planning to amend their respective land and resource management plans for the GRSG.

Table 2 outlines Idaho and southwestern Montana National Forests MIS, their presence in the analysis area, and anticipated effects of implementing an action alternative.

PURPOSE AND NEED

The purpose of the LUPA is to identify and incorporate appropriate measures into Land Use Plans (LUPs) to conserve, enhance, or restore GRSG habitat by reducing, eliminating, or minimizing threats to that habitat. The need to create this amendment arose when the inadequacy of regulatory mechanisms was identified as a significant threat in the 2010 USFWS finding on the petition to list the GRSG. The USFWS identified conservation measures in Forest Service and BLM LUPs as the principal regulatory mechanisms for habitat conservation. Therefore, the LUPAs will focus on areas affected by threats to GRSG habitat identified by the USFWS in the March 2010 listing decision (USFWS 2010).

DESCRIPTION OF THE ALTERNATIVES

The BLM and Forest Service developed a range of alternatives that are specifically structured to identify and incorporate appropriate conservation measures in land management plans to conserve, enhance or restore GRSG habitat by reducing, eliminating, or minimizing threats to that habitat. There are currently seven alternatives to consider under this analysis; a brief

description of each is provided below. The No Action Alternative is Alternative A, while the Preferred Alternative is Alternative G. For a full description of all the alternatives please refer to chapter 2 of the Final Environmental Impact Statement (FEIS).

Summaries of the alternatives presented in the FEIS are provided below.

Alternative A

The No Action Alternative (Alternative A) represents the continuation of current management direction in the BLM Field Offices and Forest Service LUPs and associated program-specific plans or amendments developed between 1976 and 2009; it proposes no new plan or management actions. Existing GRSG-related management direction is provided in the following:

- BLM WO Instruction Memorandum (IM) 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures
- Forest Service WO 2600 Memo, Interim Conservation Recommendations for Greater Sage-Grouse and Greater Sage-Grouse Habitat
- BLM WO IM 2013-128, Sage-Grouse Conservation in Fire Operations and Fuels Management
- Forest Service WO letter 5100, Sage-Grouse Conservation Methods 2013
- Idaho BLM IM 2013-036, Greater Sage-Grouse Habitat and Wildland Fire Objectives
- Idaho BLM Information Bulletin 2013-036, Interim Framework for Evaluating Proposed Activities Within Greater Sage-Grouse Preliminary Priority and Preliminary General Habitats on BLM-administered land in Idaho

Alternative A is required by Council on Environmental Quality regulations and provides a baseline for comparing the other alternatives (CEQ 1981).

The LUPs and their associated amendments, activity and implementation level plans, and other management decision documents collectively provide a varying range of goals, objectives, plan decisions, and allocations for resources and resource uses that reflect the issues at the time of their development. Direction contained in existing statutes, regulations, and policies would also continue to be implemented and may at times supplement existing LUPs.

Under the No Action Alternative, goals and objectives for BLM-administered and National Forest System lands and mineral estate would not change, and priority habitat management areas (PHMAs) and general habitat management areas (GHMAs) would not be designated. Appropriate and allowable uses and restrictions pertaining to such activities as mineral leasing and development, recreation, utility construction, or other BLM- or Forest Service-authorized actions and livestock grazing would also remain the same. The BLM and Forest Service would not modify existing or establish additional criteria to guide the identification of site-specific use levels for implementation activities. Existing Areas of Critical Environmental Concern (ACECs) would continue to be managed, but no new ACECs would be designated. Management for GRSG would occur largely on a case-by-case basis, and management would not be consistent across the planning area.

Elements Common to Alternatives B, C, D, E, F, and the Proposed Plan

Each action alternative is composed of several integral parts, as follows:

- A description of the GRSG habitat designations
- Goals, objectives, and management actions to be applied to those designations
- Required design features (RDFs), stipulations or best management practices (BMPs) associated with various management action

Allowable uses and management actions from existing LUPs that remain valid and do not require amending have been carried forward to all of the proposed alternatives. All action alternatives include direction contained in IM 2013-128 - Sage-Grouse Conservation in Fire Operations and Fuels Management, Forest Service Washington Office letter 5100, dated July 3, 2013, Sage-Grouse Conservation Methods 2013, and also a monitoring strategy.

Although each action alternative emphasizes a slightly different mix of resources and resource uses, all five action alternatives, and portions of Alternative A, strive to achieve the follow goals:

- Conserve, enhance, and restore the sagebrush ecosystem on which GRSG populations depend in an effort to maintain or increase their abundance and distribution, in cooperation with other conservation partners
- Protect GRSG habitats from disturbances that will reduce distributions or abundance of GRSG

Monitoring Strategy

Monitoring strategies for GRSG habitat and populations must be collaborative, as habitat occurs across jurisdictional boundaries (52 percent BLM, 31 percent private, 8 percent Forest Service, 5 percent state, 4 percent tribal and other federal; 75 FR 13910), and because state fish and wildlife agencies have primary responsibility for population level management of wildlife, including population monitoring on all lands (including federal). Therefore, population monitoring will continue to be conducted in partnership with state fish and wildlife agencies.

The BLM and Forest Service are finalizing a monitoring framework that will be included in the Proposed LUP Amendment/FEIS (see Appendix E of the FEIS). The monitoring framework will describe the process that the BLM and Forest Service will use to monitor implementation and effectiveness of LUP direction. It will include the following:

- Methods, data standards, and intervals of monitoring at broad and mid scales
- Consistent indicators to measure descriptions for each of the scales (see habitat assessment framework and assessment, inventory, and monitoring core indicators)
- Analysis and reporting methods
- The incorporation of monitoring results into adaptive management

The need for fine- and site-scale specific habitat monitoring may vary by area, depending on existing conditions, habitat variability, threats, and land health. Indicators at the fine- and site-scales will be consistent with the habitat assessment framework; however, the values for the indicators could be adjusted for regional conditions.

Adaptive Management

The BLM and the Forest Service will adjust management decisions and direction through an adaptive management process. This is a decision process that promotes flexible resource management decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps with adjusting resource management directions as part of an iterative learning process.

Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. In relation to the BLM and Forest Service's National Greater Sage-Grouse Planning Strategy, adaptive management will help ensure GRSG conservation measures presented in this EIS contain the needed level of certainty for effectiveness. If principles of adaptive management are incorporated into the conservation measure in the plan (to ameliorate threats to a species), then there is a greater likelihood that a conservation measure or plan will be effective in reducing threats to that species. Adaptive management is a component of each action alternative, though the guidance for adaptive management varies by alternative.

GRSG Habitat Management Area Definitions

Although each action alternative designates GRSG habitats in slightly different ways, the resulting habitat management areas can be defined by the following broad category definitions:

- **Priority Habitat Management Areas** (PHMAs, analogous to core habitat zones [CHZs])—Areas identified by the Forest Service, in coordination with respective state wildlife agencies, as having the highest conservation value to maintaining sustainable greater GRSG populations. These are breeding, late brood-rearing, and winter concentration areas.
- **Important Habitat Management Areas** (IHMAs, analogous to important habitat zones [IHZs])—High value habitat and populations that provide a management buffer for the PHMA and sagebrush focal management areas and connect patches of PHMA and sagebrush focal management areas. The areas encompass areas of generally moderate to high conservation value habitat or populations and, in some conservation areas, include areas beyond those identified by the USFWS as necessary to maintain redundant, representative, and resilient populations. The areas are typically adjacent to PHMA and sagebrush focal management areas but generally reflect somewhat lower greater GRSG population status or reduced habitat value, due to disturbance, habitat fragmentation, or other factors. No IHMA are designated in the southwestern Montana conservation area.
- **General Habitat Management Areas** (GHMAs, analogous to general habitat zones [GHZs])—Areas identified by the Forest Service, in coordination with respective state wildlife agencies, as those outside of PHMA and sagebrush focal management areas and occupied by greater GRSG seasonally or year-round.
- **Sagebrush Focal Areas** (SFAs, Proposed Plan only)—A subset of PHMA, identified by the USFWS, which are considered most vital to the species' persistence and therefore have the strongest levels of protection.

Delineated GRSG Management Areas

Due to differences in state-level mapping in Idaho and Montana, there is no consistent designation of specific GRSG seasonal habitat or vegetation across the sub-region. Each of the action alternatives identifies GRSG management areas, but the criteria and acreage of such management areas vary between the alternatives (refer to the FEIS).

Required Design Features

RDFs are a suite of features that would establish the minimum specifications for certain activities (for example, water developments, fluid mineral development, and fire and fuels management) to help mitigate adverse impacts. RDFs are incorporated under each action alternative, though they vary by alternative. In general, RDFs are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some features may not apply to some projects (e.g., a resource is not present on a given site) or may require slight variations (e.g., a larger or smaller protective area). All variations in design features would require appropriate analysis and disclosure as part of future project authorizations. Additional mitigation measures may be identified and required during individual project development and environmental review, and it is not possible to list them all at the planning level.

The BLM Proposed Plan incorporates RDFs, but the Forest Service Proposed Plan incorporates similar specifications as guidelines.

Alternative B

The BLM and Forest Service management actions, in concert with other state and federal agencies and private landowners, play a critical role in the future trends of GRSG populations. The BLM National Policy Team, as part of the National Greater Sage-Grouse Planning Strategy, established the National Technical Team (NTT) in August 2011. The NTT's mission was to develop and describe conservation measures to be considered while new or revised range-wide and long-term regulatory mechanisms were developed through LUPAs to conserve, enhance, and restore the portions of GRSG habitat on BLM-administered and National Forest System lands.

The BLM and Forest Service used GRSG conservation measures in A Report on National Greater Sage-Grouse Conservation Measures, also referred to as the NTT Report (NTT 2011) to form management direction under Alternative B.

Conservation measures under Alternative B are focused on PHMA, areas that have the highest conservation value to maintaining or increasing GRSG populations, and on Great Basin-wide concerns for GRSG. GHMA are also identified, encompassing seasonal or year-round habitat.

In summary, management under Alternative B would focus on restrictions on resource uses and protection for and enhancement of existing sagebrush habitat. The BLM and Forest Service would apply a three percent surface disturbance cap to anthropogenic disturbances (not including fire) in PHMA.

Alternative C

During scoping for this LUPA/EIS, individuals and conservation groups submitted management direction recommendations for protecting and conserving GRSG and habitat range-wide. The recommendations, in conjunction with resource allocation opportunities and internal sub-regional BLM and Forest Service input, were reviewed in order to develop BLM and Forest Service management direction for GRSG under Alternative C. Management actions in Alternative C are applied to PHMA, which encompasses all occupied habitat. Like Alternative B, it includes a 3 percent surface disturbance cap on anthropogenic disturbances (not including fire) in PHMA.

Management under Alternative C would focus on complete removal of livestock grazing from all occupied GRSG habitat on BLM-administered and National Forest System lands to conserve and enhance GRSG habitat. Other management actions are identifying occupied habitats and BLM ACECs as right-of-way (ROW) exclusion areas and closing all occupied habitat to fluid mineral leasing. Under Alternative C, the BLM would designate 39 new ACECs. Other management would be similar to Alternative A.

Alternative D

Alternative D was the Idaho/southwestern Montana sub-regional alternative for the Draft EIS. It describes conservation measures to conserve, enhance, and restore GRSG habitat on BLM-administered and National Forest System lands, while balancing resources and resource use among competing human interests, land uses, the conservation of natural and cultural resource values, and sustaining and enhancing ecological integrity across the landscape, including plant, wildlife, and fish habitat.

This alternative incorporates local adjustments to the NTT report (2011) and habitat boundaries. It would provide a balanced level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses. Conservation measures under Alternative D apply to three GRSG management areas: PHMA, GHMA, and IHMA. PHMA contain the most important and relatively intact habitats and potential restoration areas for conserving GRSG; IHMA have some level of development or disturbance that reduces the effective character for GRSG but still provides better quality habitat than GHMA; GHMA represent the remaining occupied or potentially occupied habitat outside of PHMA and IHMA.

Under Alternative D, habitat restoration and vegetation management would be similar to Alternative B, though with additional measures to prioritize vegetation rehabilitation, incorporate design features that would improve the success of rehabilitation projects, and strategically plan for wildfire suppression. Under Alternative D, the BLM and Forest Service would require no net unmitigated loss of PHMA instead of a disturbance cap.

Alternative E

Alternative E is divided into Alternative E1 and Alternative E2, which are detailed below. *Alternative E1 is applicable to NFS lands located in the States of Idaho and western Montana. Alternative E2 focuses on a portion of the Sawtooth NF that extends into northeastern Utah.*

Alternative E1

The Idaho Governor's Alternative provides the basis for Alternative E in this EIS and was developed from recommendations from the State of Idaho's GRSG Task Force. It provides recommendations and policies to aid the state in developing a conservation plan specifically adapted to Idaho GRSG populations (Idaho Sage-Grouse Task Force 2012).

Lands in Montana would be managed under Alternative A for this alternative; occupied habitat in Idaho would be delineated into three management categories: core habitat zone (CHZ), important habitat zone (IHZ), and general habitat zone (GHZ). The three proposed zones represent a management continuum that includes at one end, a relatively restrictive approach aimed at providing a high level of protection to the most important CHZ, and on the other end, a relatively flexible approach for GHZ, allowing for more multiple-use activities. While the IHZ contemplates greater management flexibility than in the CHZ, the overall quality and ecological importance of most of the habitat in this theme is more closely aligned with the habitat in the CHZ than in the GHZ. For the portion of the sub-region in Utah, PHMA and GHMA would be delineated, with the same definitions as under Alternative B.

Alternative E focuses primarily on management for the threats of wildfire, invasive species, and large infrastructure projects and secondarily on management to address threats of domestic livestock grazing management and related infrastructure, West Nile Virus, and recreation. It recommends an adaptive management approach and implementing triggers or thresholds that adjust zone criteria. There is a 5 percent disturbance cap associated with fluid mineral development under Alternative E.

Habitat restoration and vegetation management under Alternative E would focus on prioritizing conifer removal and restoring sagebrush and perennial grasslands. Native vegetation would be used for restoration to the extent practicable. In addition, invasive species would be controlled for three years after wildfire treatments. Alternative E provides guidance to reduce wildfire response time, create fuel breaks, and improve the wildfire suppression baseline. Targeted grazing would be allowed in all habitat management zones to reduce fine fuels and mitigate for the risk of wildfire. This alternative emphasizes the need for livestock permittees to achieve the Idaho Rangeland Health Standards, while achieving flexibility and management predictability through the use of the state's adaptive management plan.

Alternative E2

This applies to the portion of the Sawtooth National Forest in Utah and is based on the State of Utah's Conservation Plan for Greater Sage-Grouse in Utah. The alternative is designed to address the threats facing the GRSG while balancing the economic and social needs of the residents of Utah. The State of Utah's Conservation Plan for Greater Sage-Grouse in Utah does not use the terms priority habitat or general habitat; however, to allow for consistency in this

document, GRSG habitat in the management areas are referred to as PHMA; GRSG habitat outside of management areas are referred to as GHMA.

Under Alternative E2, management of activities in GRSG management areas would be based on the following hierarchical protocol:

- Avoidance of disturbance to habitat or GRSG by an activity as the preferred option
- Minimization of disturbance if the disturbance cannot be avoided in GRSG habitat, with mitigation for the effects of the minimization decisions
- Mitigation of the disturbance from an activity in GRSG habitat is required if a disturbance cannot be avoided

In addition to avoidance of disturbance, emphasis would be placed on expanding GRSG habitat by aggressively treating areas where there are encroaching conifers or invasive species. This alternative includes a general limit on new permanent disturbance of 5 percent of habitat on state or federally managed lands. Fire would count toward the disturbance threshold, but vegetation treatments would not. Under Alternative E2, occupied habitat outside of the state-identified GRSG management areas would not receive any management protection.

Alternative F

Similar to Alternative C, Alternative F was derived from individual and conservation group scoping comments. This alternative contains a mixture of management actions from A Report on National Greater Sage-Grouse Conservation Measures and additional restrictions on resource uses and increased resource protection. As such, Alternative F provides greater restrictions on allowable uses and less resource management flexibility than Alternative B. Conservation measures in Alternative F are focused on PHMA, GHMA, and preliminary restoration management areas. Alternative F also proposes that the BLM and Forest Service designate a system of ACECs and sagebrush conservation areas to serve as refugia for GRSG and other species. Alternative F includes a 3 percent surface disturbance cap, including fire, in PHMA.

BLM and Forest Service Proposed Plans

There are two Proposed Plans, one for the BLM and one for the Forest Service. Largely, they are the same. There are minor differences between the plans, primarily due to land management planning terminology. For the full details of each agency's Proposed Plan, please refer to Chapter 2 of the FEIS

The Proposed Plans represent a management strategy to address GRSG, their habitat and associated threats in the Idaho and Southwestern Montana Sub-region. The Proposed Plan has been developed through a coordinated partnership of BLM, Forest Service, the States of Idaho and Montana, and the USFWS.

The Proposed Plans incorporate appropriate conservation measures to conserve, enhance, and restore GRSG habitat by reducing, eliminating, or minimizing threats to that habitat. The Proposed Plans are also consistent with the objectives described in the USFWS Conservation Objectives Team (COT) Report (USFWS 2013) to "Conserve GRSG so that it is no longer in danger of extinction or likely to become in danger of extinction in the foreseeable future…" through "maintaining viable, connected, and well-distributed populations and habitats across [the

range of GRSG], through threat amelioration, conservation of key habitats, and restoration activities."

To achieve these objectives the Forest Service Proposed Plan includes a combination of desired conditions, objectives, guidelines, and standards, as follows:

- Vegetation/habitat management direction to be applied during project development and implementation
- Land allocation decisions
- Delineation of five conservation areas (refer to the FEIS) to support evaluation of the adaptive management strategy and 3 percent anthropogenic disturbance cap
- Delineation of PMHA, IMHA, and GMHA, with associated program management direction
- A mitigation framework and strategy
- Development of a Fire and Invasives Assessment Tool assessment
- Associated monitoring to support these decisions

Conservation measures in the Proposed Plans for lands in Idaho would apply to PHMA, IHMA, and GHMA; in Montana, only PHMA and GHMA are designated.

Similar to Alternative B, the BLM and Forest Service would apply a 3 percent surface disturbance cap on anthropogenic disturbances in PHMA but would count only those disturbances from lands, minerals, and roads activities.

The Proposed Plans also would establish SFA, a subset of PHMA, identified by the USFWS. These are considered most vital to the species persistence and so have the strongest levels of protection. For example, in SFA there would be no surface occupancy (NSO) and no waivers, exceptions, or modifications for fluid mineral leasing.

DESCRIPTION OF THE ANALYSIS AREA

The distribution of GRSG is closely aligned with the distribution of sagebrush-dominated landscapes (Schroeder et al. 1999). In this sub-region, large expanses of sagebrush still occur in portions of southwestern and south-central Idaho, in association with the Great Basin Core population shared with Nevada, Oregon, and Utah, as well as in portions of the Snake-Salmon-Beaverhead population north of the Snake River.

The Idaho and Southwestern Montana Sub-region includes BLM-administered and National Forest System lands in Idaho and southwestern Montana, excluding the Idaho panhandle. This Biological Evaluation and Wildlife Specialist Report addresses only the National Forest System lands. The specific National Forests in the planning area are Boise, Caribou-Targhee, Curlew National Grassland, Salmon-Challis, and Sawtooth in Idaho and Beaverhead-Deerlodge in southwest Montana. The Idaho and Southwestern Montana Sub-region also includes the portion of the Sawtooth National Forest in Box Elder County, Utah.

The vast majority of the Idaho and Southwestern Montana Sub-region lies in Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) IV; a small

portion of southeastern Idaho is in MZ II and is associated with the Wyoming Basin population. Within the sub-region, GRSG occupy all or portions of ten populations described in Connelly et al. (2004). The Great Basin Core and Wyoming Basin populations encompass portions of adjacent states. Habitat mapping has been coordinated across state boundaries.

BIOLOGICAL EVALUATION

This Wildlife and Sensitive Plant Specialists Report addresses sensitive species that meet the following criteria:

- Species that are known to occur on any of the National Forest system lands listed above, based on confirmed sightings
- Species that may occur on any of the National Forest system lands listed above, based on reliable unconfirmed sightings
- Species that may occur on any of the National Forest system lands listed above, based on the presence of potential habitat

Forest Service Policy —The Forest Service has developed policy regarding the designation of plant and animal species (Forest Service Manual [FSM] 2670; Supplement 2600-94-2). The Regional Forester's sensitive species list contains taxa only when they meet one or more of the following three criteria:

- The species is declining in numbers or occurrences and evidence indicates it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend
- The species' habitat is declining and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline
- The species' population or habitat is stable but limited

Forest Service Objectives—Under FSM 2672.41, the objectives for completing biological evaluations for proposed Forest Service programs or activities are as follows:

To ensure that Forest Service actions do not contribute to loss of viability of any native or desired nonnative plant or contribute to animal species or trends toward federal listing of any species listed as sensitive by Forest Service Region 2

- To comply with the requirements of the Endangered Species Act, actions of federal agencies should not jeopardize or adversely modify critical habitat of federally listed species
- To provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision=making process and to enhance opportunities for mitigation

FSM 2670.22 #2 includes the following objective for sensitive species: “Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System Lands.” FSM 2600, Section 2671.44 (Supplement 2600-94-2) provides direction on the review of actions and programs authorized, funded, or implemented by the Forest Service relative to the requirements of the Endangered Species Act.

SPECIES CONSIDERED IN THE ANALYSIS

The following sensitive species list is composed of plants, birds, mammals, amphibians, fish, and plants. Region 4 conducted a review of sensitive species in the Boise National Forest, Sawtooth National Forest, Caribou-Targhee National Forest, Salmon-Challis National Forest and Curlew National Grassland, and Region 1 sensitive species occurring in the Beaverhead-Deerlodge National Forest. The point was to identify the species that may overlap with the range of the GRSG or be affected by activities associated with the planning EIS and subsequent Region 4 or Region 1 plan amendments for the GRSG. Occurrence and known or potential habitat information was obtained from the Boise, Sawtooth, Caribou-Targhee, Salmon-Challis, and Beaverhead-Deerlodge National Forests, the Curlew National Grassland, and NatureServe (2015).

Table 1 lists Forest Service sensitive species known or suspected to exist on the aforementioned National Forests. Threatened, endangered, proposed, and candidate species are addressed separately in the biological assessment prepared for this project. All of the species in Table 1 were considered in this analysis and compared to the five criteria listed below. These criteria were used to identify species that would experience no impact from the action alternatives and could therefore be eliminated from detailed analysis. These numerical categories are referred to as Evaluation Criteria in Table 1:

1. Analysis area is outside species’ range
2. PHMA for the species does not exist in GRSG habitat (sagebrush-steppe) or is outside the elevation range of the GRSG
3. The type or intensity of the activity in the proposed action is expected to have no impact on these species or their habitat
4. Individual animals may be accidental, dispersing, migrating, happenstance, vagrant, nomadic, or opportunistic visitors to the habitats impacted by the proposal, but no affiliation or dependence on the habitats has been shown
5. The associated conservation design or mitigations eliminate any potential for impact on the species

Species in Table 2 are likely to occur in or near the analysis area or with potential habitat in or near the analysis area that may be affected (negatively or positively, directly, indirectly, or cumulatively) by an action alternative; in which case, a more detailed analysis of the project effects was conducted.

Table 1. Forest Service Region 4 sensitive species occurring or potentially occurring on the Boise National Forest, Sawtooth National Forest, Caribou-Targhee National Forest, Salmon-Challis National Forest or Curlew National Grassland and Region 1 sensitive species occurring in the Beaverhead-Deerlodge National Forest that may be influenced by an action alternative and are further analyzed in this document

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
FOREST SERVICE REGIONAL FORESTER'S SENSITIVE SPECIES				
MAMMALS				
Bighorn sheep *Ovis canadensis*	Rugged canyons, foothills, and mountainous terrain at elevations ranging from 1,450-10,500 feet. Key habitat features are steep, rugged "escape" terrain and grasses and forbs for forage. Uses the Lima Tendoy landscape in PHMA and GHMA habitat (southwest portion of the Beaverhead-Deerlodge National Forest near the Idaho border) as part of winter range.	Y	Not excluded	See detailed analysis below
Fisher *Martes pennanti*	Forested stands with high canopy cover and riparian corridors; in Idaho and Montana, moderately moist forest habitats at low or mid elevations are IHMA.	N	2	No impact
Gray wolf *Canis lupus*	Habitat generalist occurring in parts of Idaho, with a mosaic of dry and mesic conifer and subalpine forest, as well as grassland and shrubland that support big game (elk, moose, and deer).	Y	4	No impact
Great Basin pocket mouse *Perognathus parvus*	Occupied habitats in Montana are arid and sometimes sparsely vegetated: grassland-shrubland with less than 40 percent cover, stabilized sand hills, and landscapes with sandy soils, more than 28 percent sagebrush cover, and 12-78 inches of shrub height.	Y	Not excluded	See detailed analysis below
North American wolverine *Gulo gulo luscus*	Remote habitats in subalpine and montane forests.	N	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Northern bog lemming *Synaptomys borealis*	Primarily in sedge or alder-willow bogs on the edge of spruce-fir or lodgepole pine forest.	N	2	No impact
Pygmy rabbit *Brachylagus idahoensis*	Tall clumps of big sage with shrub canopy cover > 21 percent and loose, crumbly soil generally deeper than 14 inches for burrows.	Y	Not excluded	See detailed analysis below
Southern Idaho ground squirrel *Spermophilus brunneus endemicus*	Lower elevation shrub-steppe (big sagebrush, bitterbrush, native forbs and bunch-grasses) habitat, 2,200-3,200 feet.	N	2, 3[1]	No impact
Spotted bat *Euderma maculatum*	Mostly in open arid habitats dominated by Utah juniper and sagebrush, sometimes intermixed with limber pine or Douglas-fir or in grassy meadows in ponderosa pine savannah.	Y	Not excluded	See detailed analysis below
Townsend's western big-eared bat *Corynorhinus townsendii*	Roosts in caves, old mines, canyons with cliffs, and buildings in Douglas-fir and lodgepole pine forests, ponderosa pine woodlands, Utah juniper-sagebrush scrub, and cottonwood bottomland.	Y	Not excluded	See detailed analysis below
BIRDS				

[1]This species is not documented on the Boise National Forest. Surveys in non-forest portions of the Emmett Ranger District on the National Forest have not identified habitat or individuals. Nearest populations to the National Forest are 5 air miles from the administration boundary. Therefore, there is little-to-no potential for effects from the action.

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Bald eagle *Haliaeetus leucocephalus*	Nests in large conifers or cottonwoods near large rivers or water bodies and prefers fish for prey.	Y	4	No impact
Black-backed woodpecker *Picoides arcticus*	Forested areas with abundant wood-boring insects, resulting from fires or high-density and unburned, old forest with high levels of snags and logs.	N	2	No impact
Boreal owl *Aegolius funereus*	In Idaho: High-elevation spruce-fir, mixed conifer and aspen forests.	N	2	No impact
Columbian sharp-tailed grouse *Tympanuchus phasianellus columbianus*	Low elevation native shrub-grasslands with grass and forbs and insects for broods. Abundant grass composition important during all life stages. Shrubs (serviceberry, chokecherry, bitterbrush, bitter cherry, hawthorn, and aspen) are important winter food.	Y	Not excluded	See detailed Analysis below
Common loon *Gavia immer*	Nests in extreme eastern Idaho in shallow-watered natural lakes (5,000-9,000 feet) that are without rapidly fluctuating water levels, human disturbance, turbid water, and no protective cover.	N	2	No impact
Flammulated owl *Otus flammeolus*	In Idaho: Mid-elevation, old growth, or mature stands of open ponderosa pine, Douglas-fir, or stands dominated by both species.	N	2	No impact
Great gray owl *Strix nebulosa*	Mature forest that provide suitable nesting sites and foraging areas (seedling forests, meadows, and open riparian habitats adjacent to meadows), and large-diameter trees or snags.	N	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
GRSG (C[2]) *Centrocercus urophasianus*	Sagebrush/grassland vegetation with abundant native grass, forbs, and insects.	Y	Not excluded	See detailed analysis below
Harlequin duck *Histrionicus histrionicus*	Uses riparian habitats for feeding, nesting, and cover; breeds near swiftly flowing, clear, forested, or well-vegetated undisturbed mountain streams.	N	2	No impact
Mountain quail *Oreortyx pictus*	Brushy slopes and shrub-dominated communities in interior Douglas-fir, interior ponderosa pine, and chokecherry/serviceberry/rose (2,300 to >9,850 feet); in Idaho: associated with riparian shrub habitats. Overlaps with GRSG range but uses steeper terrain and different cover type (dense, tall shrubs vs. sagebrush) than GRSG.	N	2	No impact
Northern goshawk *Accipiter gentilis*	Uses a variety of forest ages, structural conditions, and successional stages and are associated with shrubland and grassland habitats; prefers transitional zones for hunting.	N	2	No impact
Peregrine falcon *Falco peregrinus anatum*	Nest sites on cliffs with a wide view, low disturbance, and abundance of prey; all forest vegetation types within 10 miles of suitable cliffs.	Y	4	No impact

[2] C = Candidate species: species that warrant listing as federally endangered or threatened, but that are not yet proposed for listing under an official rule.

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Three-toed woodpecker *Picoides tridactylus*	Mature stands with bark beetles, disease, and heart rot and recent stand-replacing burns with abundant wood-boring insects.	N	2	No impact
Trumpeter swan *Cygnus buccinator*	Lakes and ponds and adjacent marshes containing room to take off (~328 feet), shallow, unpolluted water with sufficient emergent vegetation and invertebrates, appropriate nest sites (i.e., muskrat lodges), and areas with little human disturbance.	N	2	No impact
White-headed woodpecker *Picoides albolarvatus*	In Idaho: Open and mature ponderosa pine and mixed ponderosa pine/Douglas-fir forests with large-diameter (>20 inches diameter at breast height) live ponderosa pines and snags.	N	2	No impact
Yellow-billed cuckoo (C) *Coccyzus americanus*	Large blocks of cottonwood gallery riparian habitat with a dense understory of foliage; generally local and uncommon in scattered drainages.	N	2	No impact
REPTILES AND AMPHIBIANS				
Boreal toad *Anaxyrus boreas*	Wetlands at elevations from 7,380-11,811 feet.	Y	Not excluded	See detailed analysis below

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Columbia spotted frog *Rana luteiventris*	Permanent water (marshy edges of ponds or lakes, in algae-grown overflow pools of streams) or in wet areas with emergent vegetation; may move considerable distances (mixed conifer and subalpine forests, grasslands, and shrublands) from permanent water during rainy periods after breeding.	Y	3[3]	No impact
Western toad *Bufo boreas*	Largely terrestrial and found in a variety of habitats, from valley bottoms to high elevations; breeds in lakes, ponds, and occasionally in slow-flowing streams.	Y	Not excluded	See detailed analysis below
FISH				
Big Lost River whitefish *Prosopium williamsoni*	Cold mountain lakes and fast, clear, or silty streams with large pools in the Big Lost River drainage of the Salmon-Challis National Forest.	Y	3	No impact

[3]Subsequent review of the alternatives indicates that this species will experience no effects on its habitat or populations. None of the alternatives is expected to impact any of the identified limiting factors for this species or its life requirements. Based on these factors, the Columbia spotted frog is not analyzed in additional detail.

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Bonneville cutthroat trout *Oncorhynchus clarkia utah*	The Bonneville cutthroat trout is endemic to the Bonneville Basin. While some stream populations survive, this subspecies evolved primarily in a lake environment. It is distributed throughout the southern portion of the Caribou portion of the Caribou-Targhee National Forest in the Soda Springs, Montpelier, and Westside Ranger Districts with very little overlap of winter habitat for the GRSG.	N	2, 3	No impact
Northern leatherside chub *Lepidomeda copei*	Endemic to streams in the northeastern portions of the Bonneville Basin and a few drainages in the upper Snake River Basin in Idaho.	Y	3	No impact
Westslope cutthroat trout *Oncorhynchus clarki pleuriticus*	Relatively cold and nutrient poor waters of the Columbia River Basin.	Y	3	No impact
Wood River sculpin *Cottus leiopomus*	Clean clear streams with clean rock or gravel bottoms and cool water with high oxygen content; occurs only in the Big and Little Wood River and Camas Creek subbasins in the Ketchum and Fairfield Ranger Districts of the Sawtooth National Forest.	Y	3	No impact
Yellowstone cutthroat trout *Oncorhynchus clarkii bouveri*	Clear cold streams, rivers, and lakes.	Y	3	No impact
PLANTS				

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Adoxa moschatellina Musk-root	Vernally moist places in mountains at the bottom of undisturbed, open rock slides in areas of cold air drainage. 4,400-7,000 feet in Montana. Circumboreal with US occurrences in Alaska, Colorado, IA, IL, MN, Montana, New Mexico, NY, South Dakota, Utah, WI, and Wyoming. In Montana documented from Carbon, Granite, Jefferson, Madison, Meagher, Park, and Stillwater Counties.	N	2	No impact
Agastache cusickii Cusick's horse-mint	Within rolling sagebrush hills primarily on steep, loose talus slopes with little vegetation cover below limestone outcrops, often in chutes. Woody dominants are limber pine, Douglas-fir, mountain mahogany, big sagebrush, and gooseberry; 6,500-9,500 feet in Montana. Documented from Idaho, Montana, Nevada, and Oregon.	Y	Not excluded	See detailed analysis below
Agoseris lackschewitzii Pink agoseris	Wet meadows with soil saturated through the growing season and in ecotones between wet meadows and forest; 6,950-9,450 feet in Montana. Occurs in Idaho, Montana, Washington, Wyoming, Alberta, and British Columbia.	Y	Not excluded	See detailed analysis below
Allium acuminatum Tapertip onion	Dry open forests and grasslands in the montane zone, 2,600-8,000 feet. Documented from Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming, and British Columbia.	Y	Not excluded	See detailed analysis below
A. parvum Small onion	Dry open forests, woodlands, or grasslands on warm slopes in the montane zone; 4,000-6,500 feet in Montana. Documented from California, Idaho, Montana, Nevada, Oregon, and Utah.	Y	Not excluded	See detailed analysis below

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
A. tolmiei var. *persimile* Tolmie's onion	Mixed semiarid shrub and grasslands in swales, ephemeral watercourses, or seep areas with basaltic soils; 3,000-5,000 feet. Idaho endemic.	Y	Not excluded	See detailed analysis below
Androsace chamaejasme ssp. *carinata* Sweet-flowered rock jasmine	Rock crevices and mountain slopes. 9,500-10,800 feet Colorado, New Mexico, Utah, and Wyoming.	N	2	No impact
Antennaria densifolia Dense-leaved pussy-toes	Limestone talus near or above timberline; 9,148 feet in Montana. Documented from Alaska and Montana and northwestern Canada. In Montana, documented from Deer Lodge and Granite Counties.	N	2	No impact
Astragalus amnis-amissi Lost River milkvetch	In Douglas-fir, mountain mahogany, and sagebrush[4] mostly in moist shaded areas in cracks in ledges and similar sites on or near vertical limestone cliffs and in talus at base of cliffs; 6,300-6,600 feet. Endemic to east-central Idaho.	Y	2	No impact
A. anserinus Goose Creek milkvetch	In sagebrush, rabbitbrush, and juniper on barren slopes composed of white tuffaceous sand; 5,000-5,200 feet Nevada, Idaho, and Utah.	Y	Not Excluded	See detailed analysis below

[4]Although Lost River milkvetch sometimes occurs in sagebrush, its habitat is on near vertical limestone cliffs and in talus at base of cliffs, which do not constitute GRSG habitat.

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
A. aquilonius Lemhi milkvetch	Within the sagebrush-steppe zones at lower elevations on shale, gravel banks, clay washes of gullied clay bluffs, steep eroded canyon banks, and sand bars. Endemic to east-central Idaho, with documented occurrences in Custer, Butte, and Lemhi Counties.	Y	Not excluded	See detailed analysis below
A. diversifolius var. *diversifolius* Meadow milkvetch	Sagebrush valleys or closed drainage basins in moist, often alkaline, meadows and swales; 4,400-6,620 feet. Endemic to central Idaho and northern Utah, with one historic occurrence from western Wyoming. In Idaho, distributed primarily in Custer and Lemhi Counties.	Y	Not excluded	See detailed analysis below
A. jejunus var. *jejunus* Starveling milkvetch	Sagebrush and pinyon-juniper on dry, barren ridges, summits, bluffs, hilltops, and river terraces on tuff, shale, sandstone, cobble, or clays; 5,700-7,310. Colorado, Idaho, Nevada, Utah, and Wyoming.	Y	Not excluded	See detailed analysis below
A. paysonii Payson's milkvetch	In open areas in the timber belt in open sites, such as burned areas, on decomposed granite, silty, and ashy soils; 5,500-9,300 feet in Wyoming and Idaho.	N	2	No impact
A. scaphoides Bitterroot milkvetch	Sagebrush grassland, generally with a dense cover of sagebrush on silty soils, with a moderate to high content of coarse material, often along drainages between rocky steep upper slopes and nearly level benches; 5,300-7,160 feet. Distribution limited to Lemhi County, Idaho, and Beaverhead County, Montana.	Y	Not excluded	See detailed analysis below
A. vexilliflexus var. *nubilus* White cloud milkvetch	Subalpine and alpine areas on dry open ridges and associated slopes in White Cloud Range; 8,700-9,500 feet. Endemic to White Cloud Peaks and Boulder Mountains in Custer County, Idaho.	N	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Balsamorhiza macrophylla Large-leaved balsamroot	Sagebrush and grasslands in the montane zone, most often on open, east-facing slopes (8-15 percent), with loamy soils, in a sagebrush-forb community; 7,400-7,920 feet. Documented from Idaho, Montana, Utah, and Wyoming.	Y	Not excluded	See detailed analysis below
Boechera fecunda Sapphire rockcress	Moderate to steep slopes with periodic natural erosion, warm aspects, and sparse vegetation. In Beaverhead and Silver Bow Counties, grows in mountain mahogany-juniper, limber pine woodland, very open Douglas-fir forest, sagebrush, and sparse bluebunch wheatgrass grasslands, on soils derived exclusively from calcareous sediments; 4,200-7,960 feet. Montana endemic.	Y	Not excluded	See detailed analysis below
Botrychium crenulatum Dainty moonwort	Stream bottoms, seeps, marsh edges, wet swales, alpine meadows, and grassy roadsides, often on soils of reprecipitated calcium; 2,000-7,500 feet in Montana. Documented from Arizona, California, Idaho Montana, Nevada, Oregon, Utah, Washington, Wyoming, British Columbia, and Alberta.	Y	Not excluded	See detailed analysis below
B. hesperium Western moonwort	Valley and montane zones along roadsides and in dry to moist gravelly and lightly disturbed grasslands, meadows, and mid-succession gravel bars; 2,000-9,500 feet in Montana. Documented from Alaska, Arizona, Colorado, Idaho, Montana, Oregon, Utah, Washington, Wyoming, and Canada.	Y	Not excluded	See detailed analysis below
B. lineare Slender moonwort	Moist to dry meadows, bogs, swamps, roadside ditches, dry fields, and forests in a variety of areas ranging from limestone cliffs and gravelly beaches to forest understory. Most occurrences are montane at 4,900-9,800 feet but is known from sea level to 10,000 feet. Occurs in Alaska, California, Colorado, South Dakota, Montana, Utah, Washington, Wyoming, and Canada. In Idaho documented from one possibly extirpated occurrence in Upper Priest Lake area.	Y	Not excluded	See detailed analysis below

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
B. paradoxum Peculiar moonwort	Montane and subalpine zones in mesic meadows in sagebrush and spruce lodgepole pine forests, with rough fescue, Virginia strawberry, and potentilla; 2,500-9,500 feet in Montana. Documented from California, Colorado, Idaho, Montana, Oregon, Utah, Washington, Wyoming, and Canada.	Y	Not excluded	See detailed analysis below
B. simplex Little grape fern	Diverse habitats across its range, including pastures, meadows, orchards, prairies, wetlands, fens, roadsides, and sand dunes, most of which are temporarily wet to permanently saturated, in full sun to low light understory conditions; 4,000-6,000 feet. Broadly distributed across the United States and Canada, with low abundance in many states and provinces in its range. Documented from Idaho and Montana.	Y	Not excluded	See detailed analysis below
Bryum calobryoides Beautiful Bryum	Montane to subalpine in bogs, meadows, and damp cliff sides on substrates that range from basic to acidic rock and moist soils; 5,000 feet and above. California, Colorado, Idaho, Montana, Oregon, Washington, and Canada.	Y	Not excluded	See detailed analysis below
Carex idahoa Idaho sedge	Moist alkaline meadows, often in sub-irrigated soils associated with low-gradient streams or springs and seeps, often in ecotones between wet meadow and sagebrush steppe; 4,500-8,420 feet. Documented from California, Idaho, Montana, Oregon, and Utah.	Y	Not excluded	See detailed analysis below
C. incurviformis Seaside sedge	Alpine and subalpine moist tundra, wet rock ledges, and mossy hummocks. Elevation 10,000 to 12,200 feet. Documented from Alaska, California, Colorado, Idaho, Montana, Wyoming, and Canada.	N	2	No impact
Castilleja christii Christ's Indian Paintbrush	Grassy subalpine meadows along mountain slopes and crests in loamy gravel, mainly in areas where snow drifts remain into early summer; 9,000-9,100 feet. Endemic to Harrison Mountain, Idaho.	N	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
C. covilleana Coville Indian paintbrush	Stony soil of slopes and summits in the montane and subalpine zones in bluebunch wheatgrass and Idaho fescue grasslands; 4,600-8,700 feet. Distribution limited to Idaho and Montana.	N	2, 3	No impact
Chrysothamnus parryi ssp. *montanus* Centennial rabbitbrush	Beaverhead Conglomerate rock outcrops, slump gravels, and relatively stable talus of southeast to southwest exposures; 8,800-9,800 feet. Endemic to Red Conglomerate Peaks of Idaho-Montana state line.	N	2	No impact
Collomia debilis var. *camporum* Flexible alpine collomia	Talus slopes. Documented from the North Fork of the Salmon River drainage in Idaho. Also in Montana.	N	2, 3	No impact
Cymopterus davisii Davis's wavewing	Subalpine and alpine areas on grassy slopes in gravelly disturbed sites or rock outcrops on granite and quartzite substrates. Endemic to Idaho.	Y	2	No impact
C. douglassii Douglass's biscuitroot	Alpine areas on open slopes, ridges, and summits in calcareous or dolomitic substrates and subalpine areas in open coniferous woodlands, above 9,000 feet, Idaho endemic, documented from Custer and Lemhi Counties.	Y	2	No impact
Douglasia idahoensis Idaho douglasia BOI, SAW	Whitebark pine and subalpine fir forests on north and east open gravelly soils and unstable slopes and ridges; 7,200-9,000 feet. Endemic to central Idaho.	N	2	No impact
Draba globosa (*D. densifolia* var. *apiculata*) Rockcress draba	Alpine zone in fell fields and sparsely vegetated meadows, on dry rocky ridges, at the base of talus slopes, on rocky outcrops, and among granitic boulders and talus; 9,186-9,842 feet. Colorado, Idaho, Montana, Utah, and Wyoming.	Y	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
D. trichocarpa Stanley's whitlow-grass	Steep exposed rocky slopes and rock outcroppings on granitic parent material, with low vegetation cover, typically in mountain big sage habitat[5]; 6,000-7,000 feet. Endemic to Stanley Basin in Custer County, central Idaho.	Y	2	No impact
Drosera anglica English sundew	With sphagnum moss in wet organic soils of fens and bogs in the montane zone. Approximately 7,000 feet on Beaverhead-Deerlodge National Forest. Scattered distribution over broad range. In United States, documented from Alaska, California, Colorado, Hawaii, Idaho, Maine, Michigan, Minnesota, Montana, New Jersey, Oregon, Washington, Wisconsin, and Wyoming.	N	2	No impact
Eleocharis rostellata Beaked spikerush	Wet, often alkaline soils, associated with warm springs or fens in the valley and foothills zones; 2,700-6,100 feet. Scattered distribution over broad range that encompasses much of the United States, three Canadian provinces, northern Mexico, the Greater Antilles, and the Andes. In United States, documented from 39 states (including Idaho and Montana).	Y	Not excluded	See detailed analysis below
Epipactis gigantea Giant helleborine	Streambanks, lake margins, fens with springs and seeps, often near thermal waters; 2,500-6,000 feet in Montana. Also documented from Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, Wyoming, and British Columbia.	Y	Not excluded	See detailed analysis below

[5] Although Stanley's whitlow-grass typically occurs in mountain big sage vegetation, its habitat consists of steep exposed rocky slopes and rock outcroppings, which do not constitute GRSG habitat.

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Erigeron asperugineus Idaho fleebane	Windswept rocky or gravelly slopes and ridges in alpine zones, often on limestone-derived soils, always with sparse vegetation; 6,000-10,000 feet. Idaho, Montana, and Nevada.	Y	2	No impact
Eriogonum brevicaule var. *desertorum* Desert buckwheat	Mixed grassland, saltbush, and sagebrush communities and in pinyon-juniper woodlands on gravelly or silty to clayey flats, slopes, and ridges; 4,900-9,700 feet. Documented from Nevada and Utah.	Y	Not excluded	No impact
E. capistratum var. *welshii* Welsh buckwheat	Rocky volcanic slopes and gravelly clay or sedimentary barren flats with minimal vegetation consisting of scattered sagebrush and grasses; 6,000-8,000 feet. Idaho endemic.	Y	Not excluded	See detailed analysis below
E. meledonum Guardian buckwheat	Rocky outcroppings and unstable scree slopes on granitic parent materials, with low vegetation. Typically surrounded by mountain big sage habitat[6]; 6,200 feet. Narrow endemic to Sawtooth Valley in central Idaho.	Y	2	No impact
Eupatorium occidentale Western Joepye weed	Cliff crevices and rocky outcrops and slopes in the montane and lower subalpine zones; 4,920-9,350 feet. California, Idaho, Montana, Nevada, Oregon, Utah, and Washington.	N	2, 3	No impact
Gentianopsis simplex Hiker's gentian	Fens, meadows, and seeps, usually in areas of crystalline parent material, in the montane and subalpine zones; 4,460-8,400 feet. California, Idaho, Montana, Nevada, Oregon, and Wyoming.	Y	Not excluded	See detailed analysis below

[6]Although guardian buckwheat occurs in areas that are usually surrounded by mountain big sage vegetation, its habitat consists of rock outcroppings and unstable scree slopes, which do not constitute GRSG habitat.

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Haplopappus macronema var. *macronema* Discoid goldenweed	Rocky, open, or sparsely wooded slopes (often coarse talus) in or near alpine zone; 6,840-8,900 feet. California, Colorado, Idaho, Montana, Nevada, Oregon, and Utah.	N	2, 3	No impact
Juncus hallii Hall's rush	Moist to dry meadows and slopes from valley to montane zones; 4,000-8,860 feet. Colorado, Idaho, Montana, Utah, and Wyoming.	Y	Not excluded	See detailed analysis below
Lewisia sacajaweana Sacajawea's Bitterroot	Subalpine on sparsely vegetated upper slopes and ridgetops on fractured bedrock and granitic soils near late snow banks; 5,400-9,500 feet. Endemic to mountains of central Idaho.	N	2, 3	No impact
Mimulus primuloides Primrose monkeyflower	Fens, sphagnum bogs, and wet meadows in montane and subalpine zone; 6,750-8,440 feet. Arizona, California, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Washington.	Y	Not excluded	See detailed analysis below
Noccaea idahoensis var. *aileeniae* (=*Thlaspi aileeniae*) Idaho pennycress	In sagebrush-fescue flats on loose bare sandy soil, on steep slopes among small rocks in the openings between sagebrush, and on alluvial terraces; 6,000-11,000 feet. Endemic to intermountain valleys of central Idaho.	Y	Not excluded	See detailed analysis below
Oxytropis besseyi var. *salmonensis* Challis crazyweed	Sagebrush and salt desert shrub in sandy washes or open slopes of rocky volcanic soil; 5,400-6,750 feet. Idaho endemic.	Y	Not excluded	See detailed analysis below
Oxytropis podocarpa Stalked-pod crazyweed	Gravely ridges and slopes often on limestone in alpine zone; 7,300-8,200 feet. Alaska, Colorado, Montana, Wyoming, and Canada.	N	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Phlox kelseyi var. *missoulensis* Missoula phlox	Open, exposed, limestone-derived slopes in the foothills to exposed ridges in the subalpine zone; 3,600-8,100 feet.	N	2	No impact
Penstemon compactus Cache beardtongue	Subalpine in rocky limestone open areas; 7,870-9,850 feet. Idaho and Utah.	N	2	No impact
P. idahoensis Idaho penstemon	Most commonly in Utah juniper communities restricted to tuffaceous outcrops of the Salt Lake Formation, on gentle to steep slopes, usually of south to southwest aspects; 4,900-5,710 feet. Idaho, Nevada, and Utah.	Y	Not excluded	See detailed analysis below
P. lemhiensis Lemhi penstemon	Mountain big sagebrush, grassland, and openings in Douglas-fir, lodgepole pine, and ponderosa pine forests, with big sagebrush and bunchgrasses on moderate to steep, east- to southwest-facing slopes. Some populations grow partially or entirely on road banks; 4,150-8,200 feet. Regional endemic of Idaho and Montana.	Y	Not excluded	See detailed analysis below
Phacelia minutissima Least phacelia	Sagebrush and lower montane forests in ephemerally moist areas, often near late snow banks, typically in meadows, springs, seeps, and along streambanks; 5000-8200 feet. Nevada, Idaho, Oregon, and Washington.	Y	Not excluded	See detailed analysis below
Physaria carinata ssp. *carinata* Keeled bladderpod	Gravelly calcareous slopes in the foothill zone in grassland and sagebrush; 4,000-7,500 feet in Montana. Endemic to carbonate mountain ranges of Idaho, Montana, and Wyoming.	Y	Not excluded	See detailed analysis below

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
P. c. ssp. *pulchella* Beautiful bladderpod	Gravelly calcareous soils of sparsely vegetated foothill slopes in mountain mahogany or limber pine woodlands, poorly developed stony soils of subalpine slopes and ridges, sparse grassland or cushion plant communities, and sagebrush. Usually associated with calcareous parent material but found on both limestone and associated quartzite; 6,300-9,600 feet. Endemic to Beaverhead County, Montana.	Y	Not excluded	See detailed analysis below
P. didymocarpa var. *lyrata* Salmon twin bladderpod	Within basin big sagebrush-bluebunch wheatgrass vegetation on rocky, sparsely vegetated south slopes; 4,050-5,000 feet. Endemic to Lemhi County, Idaho.	Y	Not excluded	See detailed analysis below
Pinus albicaulis Whitebark pine	Harsh cold sites on rocky poorly developed soils that lack fine material, with snowy wind-swept exposures. In association with subalpine fir, lodgepole pine, and Engelmann spruce; 5,900-10,000 feet. California, Idaho, Montana, Nevada, Oregon, Washington, Wyoming, Alberta, and British Columbia.	N	2	No impact
Poa abbreviata ssp. *marshii* Marsh's bluegrass	Alpine and granite talus slopes; 9,000-10,000 feet. California, Nevada, and Idaho.	N	2	No impact
Polygonum douglasii spp. *austiniae* Austin's knotweed	Gravelly, often shale-derived soil on open slopes and banks in montane zone; 4,320-8,520 feet. California, Idaho, Montana, Nevada, Oregon, Washington, Wyoming, Alberta, and British Columbia.	Y	Not excluded	See detailed analysis below
Potentilla cottamii Cottam cinquefoil	Cracks and crevices in quartzite outcrops, often shaded from the midday sun; 7,500 to 10,400 feet.	N	2, 3	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
P. quinquefolia Five-leaf cinquefoil	Montane to alpine zones on dry gravelly soil of exposed ridges and slopes in Idaho fescue grassland. Above 8,500 feet on B-D. Colorado, Idaho, Montana, Oregon, Utah, and Wyoming; also in Canada.	N	2, 3	No impact
Primula alcalina Alkali primrose	Moist to wet alkaline meadows on low, relatively level benches next to creeks and spring headswhere sub-irrigated soils are saturated to the surface throughout the growing season. Soils are alluvial, alkaline, fine textured, and light colored, derived from outwash of predominantly carbonate rocks; 6,300-7,200 feet. Idaho and Montana.	Y	Not excluded	See detailed analysis below
P. incana Mealy primrose	Wet meadow habitats, often calcareous, with relatively stable water tables where soils remain moist to saturated throughout the growing season but are seldom to never inundated; bogs and stream banks; 6,500-8,694 feet. Alaska, Colorado, Idaho, Montana, North Dakota, Utah, Wyoming, and Canada.	Y	Not excluded	See detailed analysis below
Pyrrocoma (=*Haplopappus*) *insecticruris* Bugleg goldenweed	Grassland and sagebrush communities in vernally wet meadows and flats, with shallow basalt soils. Grassland/sagebrush communities; 4,500-7,500 feet. Endemic to Idaho.	Y	Not excluded	See detailed analysis below
Saussurea weberi Weber's saw-wort	Moist meadows in the alpine zone; 9,400 feet. Regional endemic of southwest Montana, northwest Wyoming, and central Colorado.	N	2	No impact
Saxifraga tempestiva Storm saxifrage	Vernally moist open soil in meadows and on rock ledges in subalpine and alpine zones; 7,920-9,900 feet. Endemic to western Montana.	N	2	No impact

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Scheuchzeria palustris Pod grass	Valley and montane zones in wet organic soil of fens, usually with sphagnum. Surrounding vegetation is coniferous forest; 2,500-7,000 feet. In Montana. Circum-boreal species with broad range in United States, including Idaho and Montana.	N	2	No impact
Thalictrum alpinum Alpine meadowrue	Moist valley, montane, and lower subalpine areas, often in moist alkaline meadows, sometimes along stream channels on variable substrates, including peat, marl, calcareous silt, silty clay, or clay loam; 4,855-8,280 feet. Circumpolar distribution. In United States, documented from Alaska, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Wyoming.	Y	Not excluded	See detailed analysis below
Thelypodium repandum Wavy-leaf thelypody	Within the shrub-steppe zone, on moderate to steep, unstable, generally south-facing slopes of rocky, gravelly, to cindery substrate derived from Challis volcanic and metamorphic rock with extensive bare ground and sparse vegetation (5 to 20 percent cover); 4,900-7,000 feet. Endemic to east-central Idaho.	Y	Not excluded	See detailed analysis below
Trichophorum cespitosum Tufted club-rush	Montane to alpine zones in wet meadows and sphagnum-dominated fens; 2,500-9,500 feet in Montana. Circum-boreal with United States distribution south to Oregon, Idaho, Montana, and Utah.	Y	Not excluded	See detailed analysis below
Trifolium eriocephalum Woolly-head clover	Dry meadows, woods, and margins in the foothill and lower montane zones; 4,500-5,500 feet in Montana, California, Idaho, Montana, Nevada, Oregon, Utah, and Washington.	Y	Not excluded	See detailed analysis below
T. gymnocarpon Holly-leaf clover	Open woods and slopes, usually in dry soil of sagebrush steppe to ponderosa pine forest in the foothills to lower montane zone; 4,800-6,300 feet. Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Wyoming.	Y	Not excluded	See detailed analysis below

SPECIES	HABITAT DESCRIPTION AND RANGE	KNOWN Oregon SUSPECTED TO BE IN ANALYSIS AREA?	EVALUATION CRITERIA	INITIAL BIOLOGICAL DETERMINATION
Veratrum californicum California false-hellebore	Montane and subalpine zone in wet meadows and along streambanks. On B-D, these wetlands are in forest; 6,100-7,360 feet. Arizona, California, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming.	N	2	No impact
Xanthoparmelia idahoensis Idaho range lichen	Mountain rangelands of central Idaho in sagebrush. Documented from widely disjunct localities in Colorado, Idaho, and Alberta.	Y	Not excluded	See detailed analysis below

Table 3. Species analyzed in detail because they may be affected by one of the action alternatives

Species	Category	Habitat Affinity	Species Group
MAMMALS			
Bighorn sheep *Ovis canadensis*	R1 Sensitive	CF, DF, SHR, MS, GRA, S	Sagebrush-associated species
Great Basin pocket mouse *Perognathus parvus*	R1 Sensitive	GRA, SHR, S	Sagebrush-associated species
Pygmy rabbit *Brachylagus idahoensis*	R1 & R4 Sensitive	S	Sagebrush-associated species
Spotted bat *Euderma maculatum*	R1 & R4 Sensitive	DF, FM, PP, S	Sagebrush-associated species
Townsend's western big-eared bat *Corynorhinus townsendii*	R1 and R4 Sensitive	DF, PP, S	Sagebrush-associated species
BIRDS			
Columbian sharp-tailed grouse *Tympanuchus phasianellus*	R4 Sensitive	SHR, GRA, MS, S, RIP	Sagebrush-associated species
GRSG *Centrocercus urophasianus*	R1 and R4 Sensitive	MS, S	Sagebrush-associated species
REPTILES AND AMPHIBIANS			
Boreal toad *Anaxyrus boreas*	R4 Sensitive	WET, WST, T	Sagebrush-associated species
Western toad *Bufo boreas*	R1 Sensitive	WAT,WET, WST, T	Sagebrush-associated species
PLANTS			
Agastache cusickii Cusick's horse-mint	R1 Sensitive	C, MS, S	Plants

Species	Category	Habitat Affinity	Species Group
Agoseris lackschewitzii Pink agoseris	R4 Sensitive	M	Plants
Allium acuminatum Tapertip onion	R1 Sensitive	C, GRA	Plants
A. parvum Small onion	R1 Sensitive	C, GRA	Plants
A. tolmiei var. *persimile* Tolmie's onion	R4 Sensitive	SP in SHR and GRA	Plants
Astragalus anserinus Goose Creek milkvetch	R4 Sensitive	S, SHR, P/J	Plants
A. aquilonius Lemhi milkvetch	R4 Sensitive	DR, R in S	Plants
A. diversifolius var. *diversifolius* Meadow milkvetch	R4 Sensitive	M and SP in S	Plants
A. jejunus var. *jejunus* Starveling milkvetch	R4 Sensitive	S, P/J	Plants
A. scaphoides Bitterroot milkvetch	R1 Sensitive	S, GRA	Plants
Balsamorhiza macrophylla Large-leaved balsamroot	R1 Sensitive	S, GRA	Plants
Boechera fecunda Sapphire rockcress	R1 Sensitive	SHR, P/J, C, S, GRA	Plants
Botrychium crenulatum Dainty moonwort	R1 and R4 Sensitive	SP, M	Plants
B. hesperium Western moonwort	R1 Sensitive	GRA, M, R	Plants

Species	Category	Habitat Affinity	Species Group
B. lineare Slender moonwort	R4 Sensitive	M, SP, R	Plants
B. paradoxum Peculiar moonwort	R1 and R4 Sensitive	M in S and C	Plants
B. simplex Little grape fern	R4 Sensitive	M, SP	Plants
Bryum calobryoides Beautiful Bryum	R4 Sensitive	M	Plants
Carex idahoa Idaho sedge	R1 Sensitive	M, SP	Plants
Eleocharis rostellata Beaked spikerush	R1 Sensitive	SP	Plants
Epipactis gigantea Giant helleborine	R1 Sensitive	RIP, SP	Plants
Eriogonum brevicaule var. *desertorum* Desert buckwheat	R4 Sensitive	GRA, S, SHR	Plants
E. capistratum var. *welshii* Welsh buckwheat	R4 Sensitive	S, GRA	Plants
Gentianopsis simplex Hiker's gentian	R1 Sensitive	M, SP	Plants
Juncus hallii Hall’s rush	R1 Sensitive	M	Plants
Mimulus primuloides Primrose monkeyflower	R1 Sensitive	M	Plants
Noccaea idahoensis var. *aileeniae* (=Thlaspi aileeniae)	R4 Sensitive	S	Plants

Species	Category	Habitat Affinity	Species Group
Idaho pennycress			
Oxytropis besseyi var. *salmonensis* Challis crazyweed	R4 Sensitive	S, SHR	Plants
Penstemon idahoensis Idaho penstemon	R4 Sensitive	P/J	Plants
P. lemhiensis Lemhi penstemon	R1 and R4 Sensitive	GRA, C, S	Plants
Phacelia minutissima Least phacelia	R4 Sensitive	S, C	Plants
Physaria carinata ssp. *carinata* Keeled bladderpod	R1 Sensitive	GRA, S	Plants
P. c. ssp. *pulchella* Beautiful bladderpod	R1 Sensitive	SHR, C, GRA, S	Plants
P. didymocarpa var. *lyrata* Salmon twin bladderpod	R4 Sensitive	S	Plants
Polygonum douglasii spp. *austiniae* Austin's knotweed	R1 Sensitive	R, SHR, C	Plants
Primula alcalina Alkali primrose	R1 and R4 Sensitive	M	Plants
P. incana Mealy primrose	R1 Sensitive	M	Plants
Pyrrocoma (=*Haplopappus*) *insecticruris* Bugleg goldenweed	R4 Sensitive	GRA, S	Plants
Thalictrum alpinum	R1 Sensitive	M, RIP	Plants

Species	Category	Habitat Affinity	Species Group
Alpine meadowrue			
Thelypodium repandum Wavy-leaf thelypody	R4 Sensitive	S	Plants
Trichophorum cespitosum Tufted club-rush	R1 Sensitive	M	Plants
Trifolium eriocephalum Woolly-head clover	R1 Sensitive	M, C	Plants
T. gymnocarpon Holly-leaf clover	R1 Sensitive	S, PP	Plants
Xanthoparmelia idahoensis Idaho range lichen	R4 Sensitive	S	Plants
Key: C = Coniferous forest; DF= Douglas-fir; DR = ephemeral drainages, washes; FM = Forest meadows; GRA = Grassland; M = Meadows (wet or dry), fens; MS = Mountain shrub; P/J = Pinyon-juniper; PP = Ponderosa pine; R = Rock outcrops, gravel, open talus; RIP = Riparian; SHR = Shrubland; S = Sagebrush; SP = Seeps, springs, swales; T = Terrestrial; WAT = Water; WET = Marshes, shallow ponds; WST = Streams			

I. SPECIES INFORMATION AND EFFECTS ANALYSIS (Direct, Indirect, and Cumulative)

A. Greater Sage-Grouse

Life History

GRSG depend on a variety of semiarid shrub-grassland (shrub-steppe) habitats throughout their life cycle and are considered obligate users of sagebrush (e.g., *Artemisia tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), *A. t.* ssp. *vaseyana* (mountain big sagebrush), and *A. t. tridentata* (basin big sagebrush; Patterson 1952; Braun et al. 1976; Connelly et al. 2000; Connelly et al. 2004; Miller et al. 2011). GRSG also use other sagebrush species (which can be locally important), such as *A. arbuscula* (low sagebrush), *A. nova* (black sagebrush), *A. frigida* (fringed sagebrush), and *A. cana* (silver sagebrush; Schroeder et al. 1999; Connelly et al. 2004). GRSG distribution is strongly correlated with the distribution of sagebrush habitats (Schroeder et al. 1999; Connelly, Rinkes, et al. 2011). GRSG exhibit strong site fidelity (loyalty to a particular area) to seasonal habitats (i.e., breeding, nesting, brood rearing, and wintering areas; Connelly et al. 2004; Connelly, Hagen, et al. 2011). Adult GRSG rarely switch from these habitats once they have been selected, limiting their ability to respond to changes in their local environments (Schroeder et al. 1999; The life history section is referenced from the Greater Sage-Grouse

(*Centrocercus urophasianus*): Conservation Objectives: Final Report (COT) (USFWS 2013; cf. Garton et al. 2011 and Garton et al. 2015).

Based on GIS analysis of the EIS planning area, Table 3 describes the number of acres in each forest, the number of acres of PHMA and GHMA in each forest, and the percentage of the forest considered occupied habitat.

Table 3. Land area supporting GRSG habitat classified asPHMA and GHMA by National Forest in the Planning Area

FOREST NAME	Forest Acres	PHMA	GHMA	Total Occupied	Percent of Forest
Beaverhead-Deerlodge National Forest	2,070,286	162,485	194,581	357,066	17
Boise National Forest	2,204,572	21,287	57,252	78,539	4
Caribou-Targhee National Forest	2,849,127	108,857	179,774	288,631	10
Curlew National Grassland	47,479	39,820	7,083	46,904	99
Salmon-Challis National Forest	4,353,530	348,158	208,487	556,645	13
Sawtooth National Forest	2,110,657	282,062	212,498	494,560	23
Total EIS Area	**13,635,651**	**962,669**	**859,675**	**1,822,344**	**13**

Habitat conditions and population information were largely taken from the USFWS Final COT report (USFWS 2013) and from the BLM draft EIS, Chapter 3.

Garton et al. (2015) published a follow-up report building on the range-wide analysis of Garton et al. (2011). The 2011 book chapter in Knick and Connelly (eds.) 2011 evaluated changes in GRSG populations from roughly 1965 to 2007 examining population trajectories at multiple spatial scales. The more recent manuscript employed the same analytical methods but extends the field survey data to include 2008 through 2013. Garton et al (2015) provides reconstructed estimates for population trajectories across the species' range using for the array of populations examined in 2011.

From 2007 to 2013, data suggests that minimum counts for breeding males range-wide fell from 109,990 to 48,641, a decline of 56%. Using population persistence models consistent with those from Garton et al. (2011), Garton et al. (2015) examines future scenarios for males range-wide (excluding Colorado) and for individual populations at multiple spatial scales. For example, a minimum number of males counted at leks for the entire range-wide distribution, excluding Colorado, were 40,505 birds in 2013 and projected to decline to 19,517 males in 30 years (2030), and 8,154 males in 100 years (2107) based on the scenario examined.

As outlined in past review, many factors potentially contribute to projected declines (Stiver, et al. 2006, NTT 2011, USFWS 1013; e.g. drought, climate change, disease, invasive plants, wildfire,

habitat destruction). Garton et al (2015) suggests that environmental conditions and management actions through 2013 have not reversed the pattern of population declines observed in most populations since the 1970's or 1980's. Alternative A (continue current management) as outlined in this FEIS, most closely reflects the scenario examined in Garton et al (2011) and Garton et al (2015). As noted earlier, the Determinations in this biological evaluation reflect an evaluation of conditions for GRSG and the consequences of management for future populations of GRSG under each of the analyzed alternatives for NFS lands based on requirements for providing environmental conditions to assure the persistence of GRSG habitats within the capability of the unit to support these habitats when GRSG use them. The evaluation for each alternative carefully considers the context provided by the Garton et al (2011) and Garton et al (2015) analysis for those population using NFS lands.

Habitat and Population Condition by Forest

Beaverhead-Deerlodge National Forest

The Beaverhead-Deerlodge National Forest falls within the Southwest Montana sage-grouse population (USFWS 2013). Garton et al. (2011) analyzed this population as four separate smaller populations—Bannack, Wisdom, Red Rock, and Bridges—but did not provide an analysis of the overall population. Telemetry data, however, has demonstrated considerable intermingling between each of these lek complexes, clarifying that these birds represent a single population. Based on current management strategies and threats and known population numbers in this area, Garton et al. (2011) suggested that there was between a 55 and 70 percent probability of the population dropping below 500 birds/200 males by 2037.

There are a total of 162,485 acres of PHMA and 195,581 acres of GHMA in the Beaverhead-Deerlodge National Forest. Habitats on the Beaverhead-Deerlodge NF are primarily used as summer brood-rearing habitat. There are no leks on the Forest, and the majority of winter, nesting and breeding habitat occurs off NFS lands.

Boise National Forest

The Boise National Forest is contained in the Northside Snake River GRSG population. This area has a large amount of publicly managed land, largely BLM and Forest Service. Within the southern portion of this population, wildfires and invasive species continue to reduce the habitat quality. The mountain valley portions of this population appear to have relatively stable habitats. Thus far, energy development is very limited, and there are few wild horses. A recent rate of change analysis indicates this GRSG population has been stable to increasing from 2007 to 2010. Garton et al. (2011) indicated that this population had virtually no chance of declining below 500 in the next 100 years. Population analysis indicates that GRSG have fluctuated around 5,000 males since 1992. Because of the relatively large numbers of birds and stable to increasing populations, it is considered low risk.

Habitat trends were relatively static during the last decade, based on some changes to livestock grazing on adjacent lands. Higher elevation areas are generally intact, though may be at risk of encroachment by Douglas-fir. There are a total of 21,287 acres of PHMA and 57,252 acres of GHMA in the Boise National Forest. Recent wildfires on the Mountain Home Ranger District have resulted in the loss of sagebrush habitats on this portion of the Forest. GRSG habitats on

the Boise NF function primarily as brood-rearing habitat. There are no leks on the Forest, and breeding and winter habitats are primarily located off-Forest.

Caribou-Targhee National Forest

The Caribou-Targhee National Forest includes four different GRSG populations, as described in the COT report (USFWS 2013): Bear Lake, Southside Snake River, Mountain Valleys, and East Central Idaho. Each of these populations differs in its security (very secure to at-risk), population numbers and trends, and quantity and quality of habitats. Most of the habitat contained in the forest is generally intact and provides brood-rearing habitat during the summer and early fall.

The Caribou-Targhee National Forest contains 108,857 acres of PHMA and 179,774 acres of GHMA. Based on current management strategies and threats and known population numbers in this area, Garton et al. (2011), suggested that depending on which population (above) referred to, that in part can be found on the National Forest, there was between a 0 and 100 percent chance of the population dropping below 500 birds/200 males by 2037.

Curlew National Grassland

The Curlew National Grassland includes the Southside Snake River population, as described in the COT report (USFWS 2013). This area contains a large amount of publicly managed land (largely BLM). The area also includes among the least fragmented and largest sagebrush-dominated landscapes in the extant range of GRSG (Knick and Hanser 2011) in Idaho.

However, the northeastern portion of this population is more environmentally similar to areas where sagebrush communities, and sage-grouse populations associated with these, have been extirpated due to extensive wildland fires (Wisdom et al. 2011).

On the Curlew National Grasslands, there are 39,820 acres of PHMA and 7,083 acres of GHMA which are primarily used by GRSG for breeding and nesting habitat. The Grassland is contiguous to sagebrush communities on BLM lands that are used for winter habitat.

Based on current management strategies and threats and known population numbers in this area, in the Northern Great Basin, Garton et al. (2011) suggested that there was a 2% chance of the population dropping below 500 birds/200 males by 2037.

Salmon-Challis National Forest

The Salmon-Challis National Forest is found in the Mountain Valleys GRSG population and is generally used by birds for mid- and late-season brood-rearing habitat. On the Salmon-Challis National Forest, there are 348,158 acres of PHMA and 208,487 acres of GHMA. A recent rate of change analysis indicates this population has been stable to increasing from 2007 to 2010. Garton et al. (2011) indicated that this population had virtually no chance of declining below 500 in the next 100 years. The birds that pertain to this population are part of a larger population that has fluctuated around 5,000 males since 1992. Because of relatively large numbers of birds and stable to increasing populations, this population is considered low risk.

Sage-grouse winter habitats primarily occur off-Forest. Three leks are known to occur on the Forest, but the majority of the breeding, nesting and winter habitat occurs off-Forest for this

population. Sagebrush habitats on the forest provides early and late brood-rearing habitats. Sagebrush habitats in proximity leks, both on and adjacent to the Forest, also may function as nesting habitat.

Sawtooth National Forest

As the Sawtooth National Forest is divided over a large landscape, some of the habitat falls in one of the following different populations: Sawtooth, Southside Snake River, and the Northside Snake River population, as described in the COT report (USFWS 2013).

The Sawtooth population in central Idaho did not have sufficient data to allow analysis by Garton et al. (2011).This area is largely encompassed by the Sawtooth National Recreation Area and includes a high proportion of public land. It declined to one male on one lek in 1986 and was subsequently increased by translocation during the mid-1980s. Overall this population is considered at high risk.

Habitat on the Sawtooth National Forest for the Snake River population generally includes mountain valleys that provide birds with mid- and late-season brood-rearing habitat. A recent rate of change analysis indicates this population has been stable to increasing from 2007 to 2010. Garton et al. (2011) indicated that this population had virtually no chance of declining below 500 in the next 100 years. Sagebrush habitats on the Minadoka Ranger District support a number of sage-grouse leks, and the area functions primarily as nesting and brood-rearing habitat. Some winter habitat may also occur in this area, but the primary winter habitats are off-Forest.

Lastly there is a portion of the forest within the Northern Great Basin population. This area contains a large amount of publicly managed land, largely BLM. The area also includes among the least fragmented and largest sagebrush-dominated landscapes in the extant range of GRSG (Knick and Hanser 2011) in the Great Basin and is connected to the Northern Great Basin PAC to the west (USFWS 2013). Habitats on this unit include breeding, nesting brood-rearing and winter habitats. The NFS lands are considered at high risk from invasive species, wildfire and conifer encroachment. The northern and eastern portions of the population are environmentally similar to areas where GRSG historically occurred and habitat losses can be partially attributed to these threats (Wisdom et al. 2011).

There are 282,062 acres of PHMA and 212,498 acres of GHMA on the Sawtooth National Forest.

Threats by Forest

The COT (USFWS 2013) identifies the primary threats facing GRSG populations, including those found in Idaho. This information provides a the foundation from which we outline the dominant threats to individual populations or subpopulations associated with NFS lands below.

Beaverhead-Deerlodge National Forest

Key threats are generally limited to grazing management, isolated sagebrush control, and conifer expansion into GRSG habitats in localized instances. Habitat conversion due to conifer expansion and some vegetation treatments on the Idaho side of this management zone may also affect this population. Given its size, limited habitat threats, and ties to Idaho's birds, the Southwest Montana population is characterized as being at a low level of risk.

Boise National Forest

Key broad-scale threats to this GRSG population that contains habitat in and next to the Boise National Forest are wildland fire, weeds and invasive annual grasses, potential wind energy development, and grazing. Those threats characterized as localized are sagebrush elimination, agricultural conversion, conifer encroachment (pinyon-juniper), land development for human habitation, and recreation.

Caribou-Targhee National Forest

Key GRSG threats in and around the Caribou-Targhee National Forest are wildfire and subsequent invasion of exotic and annual grasses or weeds, some mining, grazing, and the potential threat of wind energy development.

Curlew National Grassland

Key GRSG threats in and around the Curlew National Grassland are wildfire and invasion of exotic and annual grasses or weeds. Other lesser threats are grazing and a limited spatial area of public ownership, with interspersed private lands largely under cultivation.

Salmon-Challis National Forest

Threats to GRSG and their habitats in and around the Salmon-Challis National Forest are grazing and disturbances from recreation and travel management. Conifer encroachment, infrastructure, and recreation might also threaten the persistence of GRSG in the area.

Sawtooth National Forest

Key threats to GRSG on and around the Sawtooth National Forest are wildfire, invasive species (cheatgrass and other weeds), pinyon-juniper and other conifer encroachment, grazing, and infrastructure. In addition, at the local scale, threats are sagebrush to agriculture conversion, wind energy development, mining, and ongoing recreation.

Effects Analysis By Alternative

This section evaluates direct, indirect and cumulative effects of implementing each of the alternatives relative to their conservation effectiveness for GRSG on NFS lands. For purposes of this analysis, key threats are evaluated relative to the alternative's efficacy in providing habitats that support viable populations on NFS lands. This analysis synthesizes the understanding developed more broadly in the FEIS and provides a summary of the effects most relevant to our determination.

Evaluating Viability

Forest Service policy based on the National Forest Management Act (NFMA) and associated regulations motivates careful consideration of the conservation status of sensitive species. In this section we briefly outline the legal foundation and the policy which establishes our approach to evaluating the contribution of habitat on NFS land to the overall viability of the

GRSG, and how that evaluation differs among NFS units depending on the inherent capability and suitability of the environment.

The statutory underpinning for evaluating viability of species expressed in 16 U.S.C. §1604(g)(3)(B) requires the Secretary to promulgate regulations that shall include, but not be limited to:

(3) specifying guidelines for land management plans developed to achieve the goals of the Program which –

(B) provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, …

The Department published planning regulations in 1982, under which the land management plans associated with the current amendment for GRSG were written. The 1982 regulations included the viability provision at 36 CFR 219.19:

> Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.

All Forest Plans being considered for amendment to address GRSG conservation and recovery were developed under the 1982 planning regulations. This Biological Evaluation considers management guidance for GRSG on NFS lands in Idaho, and assesses the outcomes of the six alternatives for amendment of plans for each of NFS land management units. NFS units differ in their inherent distribution and quality of GRSG habitat. As a result, GRSG may use National Forest System lands for only a portion of the year (e.g. for summer brood-rearing habitat). In contrast, the Curlew provides breeding, nesting and brood-rearing habitats. Differences among NFS units result largely from the environmental setting, and therefore the inherent capability of the environment to support particular sage brush ecosystems varies.

As outlined in the FEIS, the capability of NFS lands to support self-sustaining populations of GRSG is limited, because not all life history traits are met on NFS lands, and the majority of GRSG habitat occurs off NFS lands. The national forests contain relatively small areas of GRSG habitat, and often the habitat on NFS land only contributes to particular life cycle requisites. This is the case on most of the NFS lands in Idaho.

Consequently, the assessment of whether habitat on NFS land is sufficient to maintain viable populations of GRSG must consider the contribution of habitat on NFS land to GRSG

persistence generally, recognizing the inherent limitations on the ability to meet needs for all GRSG life stages from habitat located exclusively on NFS land. As recognized in the NFMA, the ability of the Forest Service to provide for diversity of animal communities is limited by "the suitability and capability of the specific land area. . . " 16 U.S.C. & 1604(g)(3)(B). Accordingly, this BE considers the contribution of these NFS units to GRSG viability as follows:

- Forest plans provide for management of the environment to provide habitat to meet species' requirements associated with the particular seasons and life history stages supported on National Forest System (NFS) lands;
- Because GRSG spend only a portion of the year on NFS lands in response to the inherent capability and suitability of the lands (e.g. breeding habitat occurs off NFS), there are threats and stressors to species' which occur off of NFS land, and therefore over which the Forest Service has no jurisdiction or control;
- Managing habitats on NFS land to contribute to the support of persistent populations on NFS land is not the same as ensuring species viability over its entire range;

The scale of analysis to assess the contribution of habitat on NFS land to GRSG viability is the planning unit, which is generally considered a national forest.

The six alternatives represent various scenarios for multiple resource management on NFS land with differing outcomes for GRSG. We end our discussion in this Biological Evaluation with a determination regarding the likelihood that the scenario provides conditions to support the ***persistence*** of GRSG on the NFS units ***to meet the associated life cycle requisites*** that land is suitable for and capable of providing, based on the combined outcomes of regulatory restrictions and restoration of habitat.

Alternative A

Infrastructure

Direct and Indirect Effects

Existing LUP direction would apply under Alternative A. There would be no changes to the current National Forest System infrastructure, such as power lines, wind turbines, communications towers, fences, or roads. Permitted ROWs or special use authorizations (SUAs) would continue to allow construction, maintenance, and operation that could result in habitat loss, fragmentation, or degradation of GRSG habitat or result in barriers to migration corridors or seasonal habitats.

Construction and maintenance of infrastructure would continue to lead to higher short-term concentrations of human noise and disturbance, which could cause disruption of nesting activities, abandonment of young or temporary displacement; these could also lead to new infestations of noxious or invasive plants and an increase in edge habitat.

Existing and new power lines, wind turbines, communications towers, fences, and vehicles traveling on associated roads would continue to pose a collision hazard to GRSG or to provide

potential perching and nesting habitat for avian predators, which could result in declines in lek attendance or nest success. Though the proponents of most projects would be forced to mitigate or minimize impacts, this alternative would likely have the greatest impact on the GRSG and its habitat.

Cumulative Effects

The baseline date for the cumulative impacts analysis for GRSG is 2012. The temporal scope of this analysis is a 20-year planning horizon; land use planning documents are generally evaluated on a 5-year cycle. The temporal boundary for cumulative effects analysis for GRSG is the WAFWA MZ IV (Snake River Plain) because all of the Idaho/Montana planning area, with the exception of a small portion of privately held lands in MZ II in the southeastern corner of Idaho is in MZ IV.

Current infrastructure management activities would continue under Alternative A. ROW exclusion or avoidance areas would not be instituted as they would be in Alternatives B, C, D, E1, E2, or F. Therefore, Alternative A's direct and indirect effects of infrastructure management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase the loss and fragmentation of the sagebrush habitat and disturb GRSG in MZ IV (refer to the Cumulative Effects section of the FEIS).

Fire and Fuels

Direct and Indirect Effects

Alternative A would continue to manage wildfire and prescribed burns under current direction, which would have the fewest restrictions for fire and fuels management and a high potential for vegetation disturbance. Prescribed burns could be used in sagebrush habitat where needed to control fuel loading. Policies would not prioritize protection or restoration of mature sagebrush habitat. Increased human activity and noise associated with wildland fire suppression and prescribed fire in areas occupied by GRSG could disrupt nesting, breeding, or foraging behavior. IHMA could be removed or degraded because of the use of heavy equipment or hand tools. Other potential impacts may include injuring or killing eggs or chicks, changing species movement patterns from areas devoid of vegetation, or reducing population viability and increasing the contribution to the need to list the species.

In addition, suppression may initially result in higher rates of juniper encroachment in some areas. In the initial stages of encroachment (phase 1), fuel loadings remain consistent with the sagebrush understory. As juniper encroachment advances (phases 2 and 3) and the understory begins to thin, the depleted understory causes the stands to become resistant to wildfire and further alter fire return intervals. During years of high fire danger, the resulting heavy fuel loadings in these stands can contribute to larger-scale wildfires and confound control efforts due to extreme fire behavior.

Cumulative Effects

Current wildfire suppression and fuels management would continue under Alternative A. Limiting or prohibiting the use of prescribed fire in sagebrush habitats and emphasizing sagebrush protection during wildland fire operations would not be instituted, as they would be

under Alternatives B, C, D, E1, E2 and F. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of the existing sagebrush habitat from wildfire in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants (Annual grasses and invasive plants)

Direct and Indirect Effects

Alternative A would continue the management of invasive weeds under current direction. To reduce the likelihood of invasive weed spread and the extent of current infestations, integrated weed management techniques, including mechanical, manual, chemical, and biological control, are used. Existing coordinated weed management areas would remain in effect, and firefighting vehicles would be washed before deployment. These policies would limit impacts from weed spread as effectively as possible under current resource constraints.

The spread of weeds would continue to pose a substantial threat to the planning area by altering plant community structure and composition, productivity, nutrient cycling, and hydrology, which could result in fragmentation or degradation of existing GRSG habitat. Weeds may cause declines in native plant populations, including sagebrush habitat, through competition or displacement and, in monocultures, eliminate vegetation that GRSG use for food and cover.

Invasives do not provide suitable GRSG habitat, since it depends on a variety of native forbs and the insects associated with them for chick survival. GRSG also depend on sagebrush, which it eats year-round and uses exclusively throughout the winter for food and cover. Along with competitively excluding vegetation essential to GRSG, invasives fragment GRSG habitat or reduce habitat quality. Invasives can also create long-term changes in ecosystem processes, such as fire-cycles (see discussion under Fire and Fuels above).

Current treatments and vegetation management typically focus on vegetation composition and structure for fuels management, habitat management, and productivity manipulation. These operations improve the habitat and forage conditions for ungulates and other grazers, using surface soil stabilization to increase productivity or by removing invasive plants. Management of vegetation resources to protect GRSG would alter vegetative communities by promoting increases in sagebrush height and herbaceous cover and vegetation productivity. Treatments designed to prevent encroachment of shrubs, nonnative species, or woody vegetation would alter the condition of native vegetation communities by changing the density, composition, and frequency of species in plant communities. The intent of these management programs is to improve rangeland conditions and enhance sagebrush ecosystems. Vegetation treatments could negatively impact GRSG and its habitat in the short term from vegetation removal and disturbance but would result in long-term improvements.

Cumulative Effects

Under Alternative A, in MZ IV (refer to the Cumulative Effects section of the FEIS), current mechanical, manual, chemical, and biological control of invasive plants would continue. The short-term negative impacts of these activities on GRSG and its habitats would continue to be outweighed by the long-term beneficial impacts. Therefore, Alternative A’s direct and indirect effects of invasive plants management on GRSG in MZ IV would be largely beneficial. When

combined with the past, present, and reasonably foreseeable future actions, they would not substantially increase impacts on GRSG.

Conifer Encroachment

Direct and Indirect Effects

Expansion of conifer woodlands, especially juniper, displaces shrubs, grasses, and forbs through direct competition for resources; juniper expansion is also associated with increased bare ground and increased potential for erosion. Mature trees may offer perch sites for avian predators. Alternative A does not directly address conifer encroachment; however, habitat restoration and vegetation management policies described above under Invasive Plants and fuels treatments described under Fire and Fuels would likely also reduce juniper encroachment.

Cumulative Effects

Current conifer encroachment, management would continue under Alternative A, and the measures addressing conifer encroachment would not be instituted as they would be in several of the action alternatives. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of the sagebrush habitat from conifer encroachment in MZ IV (refer to the Cumulative Effects section of the FEIS).

Livestock Grazing

Direct and Indirect Effects

Under this alternative, livestock grazing would continue to be managed under current direction. There would be no change in the locations, numbers, timing, or method of livestock grazing in these national forests. Depending on site-specific management, beneficial or adverse impacts of grazing on GRSG or their habitat would continue. Grazing practices can be used as a tool that benefits GRSG by reducing fuel load, protecting intact sagebrush habitat, and increasing habitat extent and continuity. However, grazing at inappropriate intensity, season, or location may alter or degrade sagebrush ecosystems or reduce cover and structure. This could negatively impact lek sites or reduce the suitability of nesting and brood-rearing habitat, which could negatively impact GRSG nesting success. Other potential effects of livestock grazing on GRSG are degradation of meadow/wetland/spring/stream habitat crucial for brood rearing; competition between cattle and GRSG for forbs; occasional trampling of birds or nests or disturbance and temporarily displacement of lekking or nesting GRSG.

Under current direction, the Forest Service may use a number of mechanisms to reduce the potential for negative impacts from grazing on GRSG, if necessary. The only planning-level decision available is to decide where areas would be open and closed to livestock grazing. Future impacts would be eliminated in areas closed to grazing, but past impacts would likely persist for some time, and closing grazing may result in other harmful impacts. Other changes in management would occur at the implementation level during the permit renewal process, which occurs every ten years and for which subsequent National Environmental Policy Act (NEPA) analysis would be conducted. At the implementation level, changes in grazing practices or systems can be considered, which could reduce grazing intensity or change the season of use, for

example. In addition, changes in grazing management in riparian and wet meadows can reduce impacts in these important seasonal habitats.

Cumulative Effects

Under Alternative A, livestock grazing in MZ IV would continue to be managed through existing grazing plans, with methods and guidelines from the existing plans followed to maintain ecological conditions according to Standards for Rangeland Health. Therefore, Alternative A's direct and indirect effects of livestock grazing on GRSG in MZ IV would be largely neutral. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Under Alternative A, all mineral leasing and development and wind energy development would continue to be managed under current direction. As such, this alternative would cause the greatest amount of direct and indirect impacts on GRSG and their habitat. These impacts would be habitat loss, degradation, and fragmentation by roads, pipelines and power lines, higher levels of noise, increased presence of roads and humans, and a larger number of anthropogenic structures in an otherwise open landscape. This could result in lek abandonment, decreased attendance at the leks that do persist, lower nest initiation, poor nest success, decreased yearling survival, and avoidance of important wintering habitat in areas of energy infrastructure.

Cumulative Effects

Management under Alternative A would maintain the current acreage open to energy development. Current energy development would continue under Alternative A. The closure of areas to energy development would not be instituted as they would be under most of the action alternatives. Therefore, Alternative A's direct and indirect effects of energy and locatable minerals development, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of the existing sagebrush habitat from energy and locatable minerals development in MZ IV (refer to the Cumulative Effects section of the FEIS).

Recreation

Direct and Indirect Effects

Under this alternative there would be no changes to the current National Forest System roads, transportation plan, or recreation management. Under current management, travel on Forest Service-administered lands is limited to existing designated roads. There would be minimal seasonal restrictions. In general, the more acres and miles of routes that are designated in an area, the greater the likelihood of habitat fragmentation and disturbance on GRSG. In addition, less restrictive travel conditions usually mean higher concentrations of human use next to motorized routes. This can cause disruption of nesting activities, abandonment of young, and temporary displacement. In addition, impacts from roads may include habitat loss from road construction, noise disturbance from vehicles, and direct mortality from collisions with vehicles. Roads may

also present barriers to migration corridors or seasonal habitats. This alternative has the highest potential to impact GRSG due to the lack of restrictions on activities that cause these effects. Therefore all direct and indirect effects on the species and its habitat would likely cause current trends to continue.

Cumulative Effects

Current recreation management would continue under Alternative A. The limitation on recreational disturbances to GRSG would not be instituted as they would be under the action alternatives. Under Alternative A, the direct and indirect effects from recreation management, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased fragmentation of the existing sagebrush habitat and disturbance to GRSG in MZ IV (refer to the Cumulative Effects section of the FEIS).

Determination

Under the current management direction, existing conservation measures limit some, but not the majority of impacts to GRSG and GRSG habitat. Therefore, Alternative A of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement will likely result in a loss of viability or a trend toward federal listing.

Alternative B

Infrastructure

Direct and Indirect Effects

Under this alternative, all PHMA would be managed as exclusion areas, and GHMA would be managed as an avoidance area for new ROW and SUA projects. It would also include the following in PHMA: collocating new ROWs or SUAs with existing infrastructure; removing, burying, or modifying power lines; collocating new facilities with existing facilities, where possible; using existing roads or realignments to access valid existing rights that are not yet developed; constructing new roads to the absolute minimum standard necessary if valid existing rights could not be accessed via existing roads; and imposing a 3 percent threshold on anthropogenic disturbance in PHMA (including highways, roads, geothermal wells, wind turbines, and associated facilities).

This alternative would benefit GRSG by maximizing connectivity and minimizing loss, fragmentation, degradation, and disturbance of sagebrush habitats in PHMA by power lines, communication towers and roads. GRSG and their habitat outside PHMA would likely experience little change in direct or indirect effects. However, if the 3 percent development threshold were to concentrate new infrastructure development outside PHMA rather than just reducing it in PHMA, the extent of impacts on GRSG and their habitat outside PHMA could increase under Alternative B, relative to Alternative A. Alternative B would reduce the likelihood of collisions addressed in Alternative A. These conservation measures make this alternative more protective than Alternative A, although the general effects would be the same.

Cumulative Effects

Management actions associated with infrastructure management under Alternative B would increase protection of GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative B, in MZ IV, some of the current infrastructure management operations would continue (refer to the Cumulative Effects section of the FEIS); however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Infrastructure management would focus on ROW exclusion or avoidance areas in GRSG habitat. Therefore, Alternative B's direct and indirect effects of infrastructure management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Fire and Fuels

Direct and Indirect Effects

Under Alternative B, suppression would be prioritized in PHMA to protect mature sagebrush habitat. Suppression would be prioritized in GHMA only where fires threaten PHMA. Alternative B does not include any other specific management for wildland fire management in GHMA. Fuels treatments would be designed to protect sagebrush ecosystems by maintaining sagebrush cover, implementing fuel breaks, applying seasonal restrictions, protecting winter range, and requiring use of native seeds. Post-fuels treatments in PHMA would be designed to ensure long-term persistence of seeded areas and native plants and maintain 15 percent canopy cover. Fuels treatments in PHMA would also monitor and control for invasive species, and fuels management BMPs would incorporate invasive plant prevention measures. Overall, these conservation measures would reduce the threat of wildfire to sagebrush, compared to Alternative A; however, in general, the effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

Fire and fuels management under Alternative B would increase protection of GRSG habitat, primarily in PHMA, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the FEIS), current wildfire suppression would continue but would include an additional emphasis on protecting sagebrush habitat during suppression, planning, and staging for maximum protection of GRSG habitat. Fuels treatment would focus on protecting GRSG habitat, primarily in PHMA. Therefore, Alternative B's direct and indirect effects of fire on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Under Alternative B, weed control would continue to be managed under current direction (see Alternative A). However, GRSG vegetation conservation measures under Alternative B would benefit weed control by prioritizing restoration, including reducing invasive plants in PHMA, in order to benefit GRSG habitats. The BLM and Forest Service would require the use of native seeds and would design post-restoration management to ensure the long-term persistence of the

restoration; they would consider changes in climate when determining species for restoration. Invasive species would also be monitored and controlled after fuels treatments and at existing and new range improvements in PHMA. Alternative B incorporates fewer invasive plant management measures in GHMA compared to PHMA. However, many of the same habitat restoration and vegetation management actions would be applied, including prioritizing the use of native seeds. Together, these measures would reduce impacts on GRSG from invasive plants described under Alternative A, although the effects of the treatments would be the same.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants management, including mechanical, manual, chemical, and biological control of invasive plants, would continue. The short-term negative impacts of these activities on GRSG and their habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat, under Alternative B, would provide an added benefit to GRSG habitat. Therefore, Alternative B's direct and indirect effects of invasive plants management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Conifer Encroachment

Direct and Indirect Effects

Like Alternative A, Alternative B does not directly address conifer encroachment; however, the vegetation management conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would also likely reduce juniper encroachment and the general effects on GRSG and their habitat, as described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative B's direct and indirect effects of conifer encroachment management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Livestock Grazing

Direct and Indirect Effects

Alternative B would implement a number of beneficial management actions in PHMA to incorporate GRSG habitat objectives and management considerations into livestock grazing management. These are as follows:

- Completing land health assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Considering retiring vacant allotments

- Improving management of riparian areas and wet meadows
- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Implementing BMPs for West Nile virus
- Removing, modifying, or marking fences

Several management actions to reduce impacts from livestock grazing on GRSG GHMA would be incorporated, including the potential to modify grazing systems to meet seasonal GRSG habitat requirements and management to improve the conditions of riparian areas and wet meadows. Together these efforts would reduce the potential for negative impacts from grazing on GRSG, described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative B would provide an added benefit to GRSG habitat. Therefore, Alternative B's direct and indirect effects of livestock grazing on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Under this Alternative, PHMA would be closed to new fluid mineral leasing, nonenergy leasable mineral leasing, and mineral material sales, and it would be proposed for withdrawal from mineral entry. In addition, mandatory BMPs would be applied as conditions of approval on fluid mineral leases. NSO would be stipulated for leased fluid minerals in PHMA. A 3 percent disturbance cap on activities in PHMA would be applied and numerous conservation measures would be implemented to reduce impacts from mineral exploration and development. These measures would reduce the impacts of energy development on GRSG and their habitat in PHMA, as described under Alternative A.

Alternative B does not include specific management for fluid, salable, locatable, and nonenergy leasable minerals in GHMA or wind energy or solar energy in PHMA or GHMA. As a result, current trends would continue and impacts would be similar to those under Alternative A. Although Alternative B does not directly address wind energy development or industrial solar development, its 3 percent threshold for anthropogenic disturbances (see Infrastructure) would apply to energy development and would limit the extent of all types of energy development in PHMA.

Cumulative Effects

Management actions associated with energy development under Alternative B would increase protection of GRSG habitat, primarily in PHMA, thereby benefiting GRSG rather than removing

or fragmenting habitat. Under Alternative B, in MZ IV, some of the current energy development management would continue but would increase the emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative B's direct and indirect effects on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Recreation

Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to designated roads, so Alternative B conservation measures to limit motorized travel to designated roads, primitive roads, and trails and travel management would not be applicable. Under Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA; there would be limited opportunities for road construction in PHMA, with minimum standards applied and no upgrading of current roads. Although general impacts would be the same as Alternative A, Alternative B is more restrictive. It would likely reduce loss, fragmentation, and disturbance to GRSG leks and nesting habitat by minimizing human use and road construction or upgrades and reducing automotive collisions with individual birds.

Cumulative Effects

Management actions associated with recreation management under Alternative B would increase protection of GRSG habitat, primarily in PHMA, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative B, in MZ IV, some of the current recreation management direction would continue; however, there would be an increased emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative B's direct and indirect effects of recreation management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Determination

Under Alternative B, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative B of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

Alternative C

Infrastructure

Direct and Indirect Effects

Alternative C would have the most protective measures for GRSG. It would extend many of the Alternative B conservation measures to all occupied habitat, which would be managed as an exclusion area for new ROW projects. As a result, management under Alternative C would

encourage consolidation of GRSG habitats, facilitating habitat conservation and management and reduce the impacts of infrastructure on GRSG in a wider area than Alternative B.

Unlike Alternative B, which would permit wind energy siting in PHMA provided a development disturbance threshold of 3 percent were not exceeded, Alternative C would not permit wind energy development siting in all occupied GRSG habitat. This would reduce the effects of wind energy on GRSG, as discussed under Alternative A, more so than Alternative B.

Cumulative Effects

Actions associated with infrastructure management under Alternative C would increase protection of GRSG habitat, thereby benefiting them rather than removing or fragmenting their habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current land and realty operations would continue; however, there would be an increased emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in GRSG habitat. Therefore, Alternative C's direct and indirect effects of infrastructure management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions would not substantially increase impacts on GRSG.

Fire and Fuels

Direct and Indirect Effects

Alternative C is similar to Alternative B, except that it is more protective of GRSG and their habitat. This is because prioritization of suppression would apply to GHMA in addition to PHMA (i.e., all occupied habitat). Alternative C includes measures to manage vegetation for good or better ecological condition, and it focuses fuel breaks on areas of human habitation or significant disturbance. The general effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

The cumulative effect of management actions related to fire and fuels under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, are similar to those described in Alternative B. They would not be substantial, to change the existing population trend, or to remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Alternative C would maintain the direction of Alternative A, along with additional provisions that would limit invasive weed spread in all occupied GRSG habitat. Vegetation management would benefit weed control by prioritizing restoration, including reducing invasive plants, in order to benefit GRSG habitats. In all cases, local native plant ecotype seeds and seedlings would be used. These policies would reduce impacts from invasive plants on GRSG described under Alternative A and have similar impacts associated with treatment; however, they would include

additional conservation measures specific to limiting the spread of invasive plants. In addition, grazing would be eliminated in all occupied GRSG habitat, eliminating the potential for invasive plant spread by livestock. This would make Alternative C more protective of GRSG and their habitat than Alternatives A or B.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants treatments would continue, and the short-term negative impacts of these activities on GRSG and their habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative C would provide an added benefit to GRSG habitat. Therefore, Alternative C's direct and indirect effects of invasive plants management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Conifer Encroachment

Direct and Indirect Effects

Like Alternatives A and B, Alternative C does not directly address conifer encroachment; however, the weed control policies described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would also likely reduce juniper encroachment and the general effects of it on GRSG and their habitat, as described under Alternative A.

Cumulative Effects

Under Alternative C, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments that could reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative C's direct and indirect effects of conifer encroachment management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Livestock Grazing

Direct and Indirect Effects

Under Alternative C, grazing would be eliminated in all occupied GRSG habitat (PHMA and GHMA). This would reduce the potential for both negative and positive grazing-related impacts on GRSG and their habitat discussed under Alternative A. It would be more reductive than any of the other alternatives. No new water developments or range improvements would be constructed in occupied habitat, and only habitat treatments that benefit GRSG would be allowed. Grazing retirement would be allowed and fast tracked.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), livestock grazing would be eliminated in all occupied GRSG habitat, providing a net benefit to GRSG habitat. Therefore, Alternative C's direct and indirect effects of livestock grazing on GRSG in

MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Alternative C would expand several of the protections under Alternative B, including exclusion of new ROWs, to all occupied habitat and would prohibit new exploration permits for unleased fluid minerals (also see Infrastructure section above). Like Alternative B, the conservation measures proposed under Alternative C would reduce many of the impacts of energy and locatable minerals development on GRSG described under Alternative A, but to a larger degree than any of the other alternatives.

Cumulative Effects

Management actions under Alternative C with respect to energy development would increase protection of all occupied habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative C, in MZ IV, some of the current energy development management direction would continue; however, it would include increased emphasis on protecting sagebrush habitat by adding all occupied habitat to existing closures and proposing it for withdrawal. Therefore, Alternative C's direct and indirect effects of energy development on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG (refer to the Cumulative Effects section of the FEIS).

Recreation

Direct and Indirect Effects

Alternative C is similar to Alternative B except that it would apply to all occupied habitat and, therefore, protect a larger area of GRSG habitat than Alternative B from the same types of general recreation impacts described in Alternative A.

Cumulative Effects

Recreation management actions under Alternative C would increase protection of all occupied GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. In MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current recreation management direction would continue; however, it would increase the emphasis on protecting sagebrush habitat. Therefore, Alternative C's direct and indirect effects of recreation management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Determination

Under Alternative C, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative C of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may

impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

Alternative D

Infrastructure

Direct and Indirect Effects

Under Alternative D, PHMA, IHMA, and GHMA would be designated ROW avoidance areas, as opposed to ROW exclusion areas for PHMA under Alternative B or all occupied habitat under Alternative C. New authorizations would be collocated, when possible, in or next to disturbance to avoid disturbing GRSG or their habitat. In PHMA, new authorizations for the following would not be allowed: transmission facilities greater than 50 kilovolts (kV), wind and solar developments, commercial geothermal development, nuclear, gas, or oil developments, airports, ancillary facilities associated with any of the aforementioned development, paved or gravel roads, or landfills. In IMHA, wind and solar development would be restricted where adverse effects could not be mitigated; GHMA would be an avoidance area for wind or solar reauthorization.

New ROWs and SUAs allowed in PHMA and IHMA would not result in a net loss of GRSG habitat in the respective PHMA or IHMA areas. New authorizations or facilities would be sited outside of the 1.86-mile lek avoidance buffer areas unless NEPA analysis suggested a greater or lesser required distance. New power and communications lines in PHMA, IHMA, or GHMA outside of existing ROWs would be required to be buried; existing lines would be evaluated for burying, modifying, or relocating to at least 1.86 miles from occupied leks or winter habitat. These conservation measures would reduce the number of impacts from infrastructure relative to existing management under Alternative A and may provide some additional impact reduction over Alternative B; however, it would not be as protective of GRSG as the measures proposed in Alternative C.

Cumulative Effects

Management actions associated with infrastructure under Alternative D would increase protection of GRSG habitat, rather than removing or fragmenting habitat, thereby benefiting GRSG. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current infrastructure management actions would continue, however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Infrastructure management would focus on ROW exclusion or avoidance areas in GRSG habitat. Therefore, Alternative D’s direct and indirect effects of infrastructure management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Fire and Fuels

Direct and Indirect Effects

Like Alternative B, Alternative D would prioritize fire suppression in PHMA and IHMA, which together equal PHMA. Unlike Alternative B, it would include the following conservation measures in PHMA, IHMA, and GHMA to strategically reduce fire effects: planning and firefighter training in sagebrush management as related to suppression activities; designing and implementing fuels treatments with an emphasis on maintaining, protecting, or expanding GRSG habitats; and considering managing wildfire in conifer encroachment areas for resource benefit. Overall, Alternative D would limit damage to sagebrush habitat areas from wildfire. The general effects of fire suppression and fuels treatments would be similar to those described in Alternative A. Delineating conifer encroachment areas in PHMA, IHMA, and GHMA as areas to manage wildfire for resource benefit could protect GRSG habitat by reducing the extent of suppression-related juniper encroachment and reducing fuel loadings, which can contribute to larger-scale wildfires that confound control efforts due to extreme behavior.

Cumulative Effects

The cumulative effect of management actions under Alternative D, when combined with the past, present, and reasonably foreseeable future actions are similar to the cumulative effects described in Alternative B. They would not be substantial, to change the existing population trend, or to remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Under Alternative D, the direction described under Alternative A would be maintained, making it the same in terms of impacts from invasive plants and associated treatments. Similar to those of Alternative B, vegetation management conservation measures under Alternative D would benefit weed control in the long term by prioritizing restoration, including reducing invasive plants, and monitoring and controlling invasive species after construction and fuels treatments and at new range improvements. Unlike Alternative B, monitoring and controlling invasive species after fuels treatments and at new range improvements would apply to PHMA, IHMA, and GHMA rather than only PHMA.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants treatments would continue and their short-term negative impacts on GRSG and their habitat would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to GRSG. Therefore, Alternative D’s direct and indirect effects of invasive plants management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Conifer Encroachment

Direct and Indirect Effects

Under Alternative D, it would be a priority to implement vegetation rehabilitation projects designed to achieve the greatest improvement in GRSG abundance and distribution, including those that address conifer encroachment, in PHMA, IHMA, and GHMA GRSG habitat. Factors contributing to higher emphasis would include the likelihood of conifer encroachment into GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce conifer encroachment in IMHA and to reduce the impacts of conifer encroachment on GRSG and their habitat that were described under Alternative A. Impacts from treatments associated with this alternative would also be the same as those described for vegetation treatments under Invasive Plants and Fire and Fuels under Alternative A. Alternative D would address conifer encroachment more so than Alternatives A, B, or C and so is more protective of GRSG and their habitat than those alternatives.

Cumulative Effects

Under Alternative D, in MZ IV, conifer encroachment measures for invasive plants having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative D's direct and indirect effects of conifer encroachment management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Livestock Grazing

Direct and Indirect Effects

Management under Alternative D would include the same measures as Alternative B but would expand many of those measures to PMHA, IMHA, and GHMA. It would also manage for vegetation composition (including riparian and lentic areas) and structure consistent with appropriate GRSG seasonal habitat objectives relative to site potential. Alternatives D and F apply the same conservation measures as Alternative B; however, Alternative B largely applies only to PHMA, whereas Alternative D applies to PMHA, IMHA, and GHMA, and Alternative F applies to all occupied habitat. Collectively, the measures proposed under Alternative D would reduce the potential for negative grazing-related impacts on GRSG and their habitat described under Alternative A more so than Alternatives B or E, less than Alternative C, and similar to Alternative F.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to GRSG. Therefore, Alternative D's direct and indirect effects of livestock grazing on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Alternative D would close most PMHA and IMHA to future fluid mineral leasing and nonenergy minerals leasing and development. It would place additional stipulations and seasonal restrictions on existing fluid mineral leases in PMHA, IMHA, and GHMA. In addition, IMHA would be closed to nonenergy minerals leasing. GMHA would generally be available for new fluid or nonenergy minerals leasing, subject to applicable seasonal and daily timing restrictions. An exception would be that 0.6 mile of NSO would be required near occupied and undetermined status leks for future fluid mineral leases. Geophysical exploration would be allowed in PMHA, IMHA, and GHMA, subject to seasonal timing restrictions and other restrictions that may apply. These actions would reduce the impacts of mineral development on GRSG discussed under Alternative A to a level similar to that of Alternative B.

Unlike Alternative B, Alternative D directly addresses solar and wind energy development. Solar and wind energy development would not be allowed in PHMA. In IHMA, wind and solar energy development would be restricted where adverse effects could not be mitigated. Ancillary facilities, such as roads and electric lines, could be authorized, provided mitigation prevents any net loss of GRSG habitat. GHMA would be considered avoidance areas for wind and solar development. These actions could reduce negative impacts associated with energy development on GRSG that occur in IHMA, relative to Alternatives A and B.

Cumulative Effects

Under Alternative D, in MZ IV, some of the current management direction associated with energy development would continue, but additional emphasis on protecting sagebrush would be included. Therefore, Alternative D's direct and indirect effects of energy development on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG (refer to the Cumulative Effects section of the FEIS).

Recreation

Direct and Indirect Effects

Alternative D would apply the following conservation measures to reduce the potential negative impacts of recreation on GRSG in PMHA, IMHA, and GHMA:

- Special Recreation Permits would be analyzed on a case-by-case basis and use would be directed away from sensitive seasons and areas
- Certain developed recreation sites and associated facilities would be designed or designated to direct use away from sensitive areas
- Seasonal restrictions for authorized activities would be incorporated

Alternative D could be more protective of GRSG and their habitat than Alternatives A, B, or C because it includes additional measures.

Cumulative Effects

Alternative D would increase protection of GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current recreation management direction would

continue; however, additional emphasis on protecting sagebrush habitat would be included. Therefore, Alternative D's direct and indirect effects of recreation management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Determination

Under Alternative D, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative D of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

Alternative E1

Infrastructure

Direct and Indirect Effects

Alternative E1 is similar to Alternative B but not as restrictive. Core areas and IMHA would generally be identified as new ROW avoidance areas. Within core habitat, new infrastructure ROWs or SUAs would be collocated with existing infrastructure. In IHMA, new infrastructure could be built if habitat protection criteria were met. General impacts on GRSG and their habitat under Alternative E1 would be the same as those for Alternative A. Because Alternative E1 includes fewer limitations on infrastructure in GRSG habitat than Alternative B, the potential for some infrastructure-related impacts on GRSG may be higher under Alternative E1. However, unlike Alternative B, Alternative E1 does not promote the undergrounding of utilities, so it would not reduce the potential for collisions with GRSG.

While Alternative E1 would reduce the likelihood of impacts from infrastructure compared to existing management under Alternative A, it would not be as protective as Alternative D, which would designate PHMA, IHMA, and GHMA as new ROW avoidance areas, or Alternatives C or F, which would generally manage all occupied habitat as a new ROW exclusion area.

Cumulative Effects

Management actions associated with infrastructure under Alternative E1 would increase protection of GRSG habitat, thereby benefiting them rather than removing or fragmenting their habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current infrastructure management actions would continue; however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Infrastructure management would focus on ROW avoidance areas in GRSG habitat. Therefore, Alternative E1's direct and indirect effects of infrastructure management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Fire and Fuels

Direct and Indirect Effects

Alternative E1 would focus resources to reduce wildfire in sagebrush areas, prioritizing fire suppression and maintaining fuel breaks in core and IMHA. Fuels treatments would protect existing sagebrush ecosystems. Fire response times to core areas and IMHA would be reduced to limit fire damage. This alternative is unique in that adaptive management would be used to account for acres of habitat lost to fire in core areas and IMHA. Specific conservation measures apply to fuels management, habitat recovery and restoration, fire operations and post-fire rehabilitation in areas considered important for GRSG populations. These measures are designed to reduce the threat of wildfire to sagebrush and reduce damage to GRSG habitat, but the general effects of fire suppression and fuels treatments would be similar to those of Alternative A. Alternative E1 would be the most protective in terms of GRSG and their habitat due to the combination of suppression prioritization and adaptive management measures, but it would have short-term negative impacts on GRSG and their habitats similar to Alternatives B, C, and D from fuel break construction and maintenance.

Cumulative Effects

Management under Alternative E1 for fire and fuels would increase protection of GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting their habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the FEIS), current wildfire suppression operations would continue; however, additional emphasis would be on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of fire on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Alternative E1 would maintain the policies described under Alternative A, along with additional measures to protect core habitat, IMHA, and GHMA, which would be managed to prevent invasion. Eradication and control of invasives threatening GRSG habitat would be pursued in core habitat and IMHA; invasives would be monitored and controlled for three years following a fire in these areas. The measures under Alternative E1 would significantly reduce the impacts from invasive plants described in Alternative A. They would be the most protective in terms of controlling invasive plants in GRSG habitat, but the short-term impacts on GRSG habitat from invasive plant treatments (see Alternative A) would be the same and could affect a larger area.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants treatments would continue, and the short-term negative impacts of these activities on GRSG and their habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to GRSG. Therefore, Alternative E1's direct and indirect effects of invasive plants management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG and over the long-term, due to restoration of habitat, would result in habitat improvement.

Conifer Encroachment

Direct and Indirect Effects

Under Alternative E1, the Forest Service would prioritize the removal of conifers, using methods that would minimize disturbance to GRSG and their habitat, to the extent possible, in core habitat and IMHA. Conifer encroachment projects would focus on areas with highest restoration potential, as evidenced by low canopy cover, existing sagebrush understory, and adjacent GRSG populations, and would not be conducted in juniper stands older than 100 years. In addition, as described under Invasive Plants, core habitat and IMHA and GHMA would be managed to prevent invasion. Unlike Alternative D, Alternative E1 contains a specific restoration measure addressing conifer encroachment. However, Alternative D addresses conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. Although treatments associated with these measures could negatively impact GRSG and their habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A), they would benefit GRSG and their habitat in the long term by reducing the impacts from conifer encroachment described in Conifer Encroachment under Alternative A. Negative impacts would be negligible due to the prioritization of removal methods minimizing disturbance.

Cumulative Effects

Under Alternative E1, in MZ IV, conifer encroachment projects would be instituted as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E1's direct and indirect effects of conifer encroachment management to GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Livestock Grazing

Direct and Indirect Effects

Alternative E1 takes a very different approach to livestock grazing than the other alternatives. Management under Alternative E1 would add GRSG guidelines to grazing management plans in core habitat and IHMA. Rangeland health and permit renewal would be assessed in core habitat and IHMA; allotments in core habitat that have declining GRSG populations would be prioritized, followed by allotments in important habitat that contain breeding habitats with decreasing lek counts. If assessments determined that livestock grazing was limiting the achievement of desired habitat characteristics, grazing permits would be adjusted during the renewal process to include measures to achieve desired conditions. These measures would reduce the potential for negative impacts of livestock grazing on GRSG and their habitat (see Livestock Grazing under Alternative A) more so than Alternative A, but less than Alternative C, that would eliminate grazing in all occupied habitat. However, the measures under Alternative E1 are more likely to retain the positive benefits of livestock grazing (see Livestock Grazing under Alternative A) than Alternative C.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to GRSG habitat. Therefore, Alternative E1's direct and indirect effects of livestock grazing on GRSG in MZ IV would be largely beneficial for GRSG. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Alternative E1 would follow much of the current guidance on leasing and development of mineral resources (Alternative A) but would add measures to minimize impacts on GRSG, as follows:

- In core habitat and IHMA, exploration activities associated with oil and gas development that use temporary roads would be permissible if site disturbance were minimized
- In core habitat and IHMA, surface occupancy associated with oil and gas development would not be allowed, unless the surface development would not accelerate or cause declines in GRSG populations
- Surface disturbance from roads associated with fluid mineral development would be limited to 3 percent and 5 percent of suitable habitat per an average of 640 acres in core habitat and IHMA, respectively
- Wind energy development projects would comply with all infrastructure development BMPs and the 2012 USFWS Wind Energy Guidelines.

Impacts on GRSG from energy development would essentially continue as described in Alternative A, although their magnitude and spatial distribution would differ. The negative effects of wind energy on GRSG, as described in Infrastructure and Energy Development under Alternative A, would be reduced as the result of complying with USFWS Wind Energy Guidelines.

Cumulative Effects

Management actions associated with energy development under Alternative E1 would increase protection of GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting its habitat. Under Alternative E1, in MZ IV, some of the current energy development management direction would continue; however, additional emphasis would be placed on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of energy development on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Recreation

Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to designated roads; therefore, Alternative E1 conservation measures to limit motorized travel to designated roads, primitive roads, and trails and travel management would not be applicable. Under Alternative E1, timing and seasonal restrictions would be applied to activities known to disturb nesting GRSG. Although this approach would reduce the impacts of recreation on GRSG described in Alternative A, compared to current management under Alternative A, Alternative E1 would be less protective of GRSG than the other action alternatives.

Cumulative Effects

Management actions associated with recreation management under Alternative E1 would increase protection of GRSG, thereby benefiting GRSG. Under Alternative E1, in MZ IV, some of the current recreation management direction would continue; however, the emphasis would increase on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative E1's direct and indirect effects of recreation management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Determination

Under Alternative E1, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative E1 of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

Alternative E2

This alternative is relevant to the management of GRSG habitats on NFS lands in northeastern Utah.

Infrastructure

Direct and Indirect Effects

For all ROWs and SUAs in PHMA, management stipulations and conditions would focus on mitigating direct disturbance to GRSG during construction. PHMA would be designated as an avoidance area for new ROWs and SUAs, which is less protective of GRSG habitat than Alternatives B, C, or F, but similar to Alternatives D and E1. Similar to Alternatives B, C, and F, Alternative E2 would include a disturbance cap. However, it would apply a 5 percent as opposed to a 3 percent disturbance cap; also, the areas that the caps would apply to and the types of disturbances that contribute toward the caps would differ.

Similar to Alternative D, Alternative E2 directly addresses siting wind energy facilities; however, Alternative E2 would be less restrictive than Alternative D by avoiding rather than excluding wind energy developments in PHMA. It would apply BMPs and industry, state, and federal stipulations in cases where siting in PHMA could not be avoided. Similar to Alternative E1, Alternative E2 would not promote the utility undergrounding. Electrical transmission lines, and where feasible and consistent with federally required electrical separation standards, new

linear transmission features would be sited in existing corridors, or at a minimum, in concert with existing linear features in GRSG habitat. Therefore, in this respect, Alternative E2 would not be as likely to prevent collisions with GRSG as Alternatives B, C, D, or F and, therefore, would not be as protective of GRSG. GRSG habitat outside PHMA would not be managed for to conserve the species. No specific management actions are provided for this habitat.

Cumulative Effects

Management actions associated with infrastructure under Alternative E2 would increase protection of GRSG habitat, rather than removing or fragmenting it, thereby benefiting GRSG. Under Alternative E2, in MZ IV, some of the current infrastructure management actions would continue; however, included would be an additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG (refer to the Cumulative Effects section of the FEIS). Infrastructure management would focus on ROW avoidance areas in GRSG habitat. Therefore, Alternative E2's direct and indirect effects of infrastructure management on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Fire and Fuels

Direct and Indirect Effects

Alternative E2 would implement the following unique strategies to address response to fire and reduce the general effects of fire on GRSG, as discussed under Alternative A:

- Create and implement a statewide fire agency agreement that would eliminate jurisdictional boundaries and allow for immediate response to natural fire in PHMA
- Allow the use of fire-retardant vegetation that would buffer areas of high quality GRSG habitat from catastrophic fire
- Use prescriptive fire with caution in sagebrush habitat and only at higher elevations and in a manner designed prescriptively to benefit GRSG
- Conduct effective research into controlling fire size and protect remaining GRSG areas that are next to high-risk cheatgrass areas
- Focus research efforts on effective reclamation and restoration of landscapes altered by wildfire
- Manage winter habitat to maintain the maximum amount of sagebrush, especially tall sagebrush (80 percent), which would be above the snow and available to GRSG during a severe winter
- Coordinate the needs and efforts related to GRSG with the State of Utah Sage-Grouse Committee that was formed to develop a collaborative process to protect the health and welfare by reducing the size and frequency of catastrophic fires

Similar to Alternative B, Alternative E2 calls for prescriptive grazing to specifically reduce fire size and intensity on all types of landownership, where appropriate. Overall, the protective benefits of Alternative E2 to GRSG and their habitat would likely be most similar to that of Alternative B; however, it would have short-term negative impacts on GRSG and their habitats similar to those described under Alternative A for suppression and prescribed fire.

Cumulative Effects

Management actions under Alternative E2, with respect to fire and fuels management, would increase protection of GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the FEIS), current wildfire suppression operations would continue, but additional emphasis on protecting sagebrush habitat would be included. Therefore, Alternative E2's direct and indirect effects of fire on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Invasive Plants

Direct and Indirect Effects

Alternative E2 directs land managers to aggressively respond to new infestations to keep invasive species from spreading. Every effort would be made to identify and treat new infestations before they become larger problems. Additionally, containing known infestations in or near sagebrush habitats would be a high priority for all land management. Vegetation management tools described above for Fire and Fuels and below for Livestock Grazing would help to reduce the general impacts of invasive plants on GRSG, as described under Alternative A. Alternative E2, like Alternative E1, would be more protective in terms of controlling invasive plants in GRSG habitat than any of the other alternatives; however, the short-term impacts on GRSG habitat associated with invasive plant treatments (see Alternative A) would be the same and could affect a larger area.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plant treatments would continue, and the short-term negative impacts of these activities on GRSG and their habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to GRSG. Therefore, Alternative E2's direct and indirect effects of invasive plants management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Conifer Encroachment

Direct and Indirect Effects

Alternative E2 includes a habitat restoration and vegetation management conservation measure specific to conifer encroachment. It calls for aggressively removing encroaching conifers and other plant species to expand GRSG habitat where possible. Although treatments associated with the measures in Alternative E2 could negatively impact GRSG and their habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A), they would benefit GRSG and their habitat in the long term. This would be by reducing the negative impacts from conifer encroachment described in Conifer Encroachment under Alternative A. In comparison, Alternative D would address conifer encroachment as part of several restoration and

fire suppression conservation measures and over a larger area, which would provide a greater benefit to GRSG and their habitat. Alternative E2 is most similar to Alternative E1, except it does not include a stipulation for prioritizing removal methods minimizing disturbance.

Cumulative Effects

Under Alternative E2, in MZ IV, conifer encroachment projects would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E2's direct and indirect effects of conifer encroachment management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future, actions, it would not substantially increase impacts on GRSG.

Livestock Grazing

Direct and Indirect Effects

Alternative E2 would continue to make GRSG PHMA and GHMA available for livestock grazing. Should site-specific concerns be raised about the effect of grazing on GRSG habitat, and such effects were documented over a sufficiently long time frame, corrective management actions would be addressed through BMPs. Incompatible grazing strategies would be addressed through established rangeland management practices, consistent with the maintenance or enhancement of habitat. GRSG seasonal habitat requirements (leks, nesting, early brood rearing, late brood rearing, and winter) would be considered when managing sagebrush rangelands. Water developments would be designed to enhance mesic habitat for use by GRSG and to maintain adequate vegetation in wet meadows. In PHMA, GRSG stipulations would take precedence over stipulations for other species if conflicts were to occur and if otherwise allowable by law. Livestock fences would be located away from leks, using the NRCS fence standards to reduce bird strikes. New infestations of invasive exotic plants would be addressed aggressively to prevent spreading. Overall, the measures associated with livestock grazing under Alternative E2 would benefit GRSG and their habitat, although less than those proposed under Alternatives B, C, D, or F.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to GRSG. Therefore, Alternative E2's direct and indirect effects of livestock grazing on GRSG in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Under Alternative E2, PHMA would be considered suitable for further coal leasing and underground coal extraction. PHMA and GHMA that is not already withdrawn or proposed for withdrawal would be available for locatable mineral entry. PHMA would be open to mineral

materials and oil and gas leasing and would be an avoidance area for wind energy development, although it would not be precluded.

All of the aforementioned forms of energy development, plus nonenergy leasable mineral lands, solid mineral exploration and geophysical exploration activities, would be subject to the following stipulations, as well as BMPs accepted by industry and state and federal agencies:

- New permanent disturbance, including structures, fences, and buildings, should not be located in the occupied lek itself
- Permanent disturbance should not be allowed within 1 mile of an occupied lek, unless it is not visible to the GRSG using the lek
- Disturbance outside the lek should not produce noise 10 decibels (db) above the ambient (background) level at the edge of the lek during breeding season;
- Time-of-day (when the lek is active) and seasonal stipulations applying to specific habitats would be applied and based on site-specific conditions, in coordination with the local Utah Division of Wildlife Resources (UDWR) biologist
- Disturbance in PHMA would be avoided, if possible, or minimized by locating development in the least important habitat if avoidance in PHMA is not possible; project proponents would have to demonstrate why avoidance would not be possible
- Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area
- Barriers to migration, if applicable, would be avoided

All existing fluid mineral uses are explicitly recognized by this alternative and would not be affected by it. The GRSG conservation measures identified in the associated NEPA documents for each of these projects would continue to be implemented to protect GRSG and its habitat. Provisions of this alternative would not be added to the measures identified for each project.

GRSG habitat outside PHMA would not be managed for the conservation of the species. No specific management actions are provided for this habitat. Similar to Alternative E1, impacts on GRSG from energy development under Alternative E2 would essentially continue as described in Alternative A, although somewhat reduced by the application of BMPs.

Cumulative Effects

Management actions associated with energy development under Alternative E2 would increase protection of GRSG and their habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative E2, in MZ IV, some of the current energy development management direction would continue, but additional emphasis on protecting sagebrush habitat would be included. Therefore, Alternative E2's direct and indirect effects on GRSG in MZ IV from energy development would be largely beneficial for GRSG. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Recreation

Direct and Indirect Effects

Alternative E2 would limit or reduce impacts from recreation by preventing new permanent disturbance, including structures, fences, and buildings, in occupied leks or within 1 mile of an occupied lek, unless it is not visible to the GRSG using the lek. It would limit disturbance outside of leks to no more than 10 db above the ambient level at the edge of the lek during breeding season. Time-of-day (when the lek is active) and seasonal stipulations applying to specific habitats would be applied and based on site-specific conditions, in coordination with the local UDWR biologist.

In PHMA (nesting and brood-rearing areas and winter habitat and other habitat), disturbance would be avoided, if possible, or minimized by locating development in the least important habitat, if avoidance is not possible. Project proponents would have to demonstrate why avoidance would not be possible. Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area, and barriers to migration, if applicable, would be avoided. Alternative E2 could be more protective of GRSG and their habitat than any of the other alternatives. This is because measures to reduce impacts would apply to all recreation as opposed to only SUAs or camping.

Cumulative Effects

Management actions associated with recreation management under Alternative E2 would increase protection of GRSG, thereby benefiting GRSG. Under Alternative E2, in MZ IV, some of the current recreation management would continue; however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Therefore, Alternative E2's direct and indirect effects of recreation management on GRSG in MZ IV would be largely beneficial for GRSG. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Determination

Under Alternative E2, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative E2 of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

Alternative F

Infrastructure

Direct and Indirect Effects

Land uses and realty management under Alternative F would essentially be the same as that under Alternative B; the effects on GRSG and their habitat would be the same.

Cumulative Effects

Refer to Alternative B.

Fire and Fuels

Direct and Indirect Effects

Fire and fuels management under Alternative F would essentially be the same as that under Alternative B; the impacts on GRSG would be the same.

Cumulative Effects

The cumulative effects of fire and fuels management on GRSG and sagebrush habitat in MZ IV would be the same as Alternative B.

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Invasive plants management under Alternative F would essentially be the same as that under Alternative B. Together, these measures would reduce impacts from invasive plants on GRSG habitat, as described under Alternative A, but the effects of the treatments would be the same.

Cumulative Effects

The cumulative effects of invasive plants management on GRSG and sagebrush habitat in MZ IV would be the same as for Alternative B.

Conifer Encroachment

Direct and Indirect Effects

Like Alternatives A and B, Alternative F does not directly address conifer encroachment and would maintain the invasive plant direction described under Alternative A. Although the types of impacts would be the same, the conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts on GRSG habitat from conifer encroachment, relative to Alternative A. Alternative F could provide an additional reduction in the magnitude of impacts on GRSG habitat from conifer encroachment relative to Alternative B. This is because those measures generally would apply throughout occupied GRSG under Alternative F, and they would be limited to PHMA under Alternative B.

Cumulative Effects

The cumulative effects of conifer encroachment management on GRSG and sagebrush habitat in MZ IV would be the same as under Alternative B.

Livestock Grazing

Direct and Indirect Effects

Alternative F would include beneficial management actions similar to those of Alternative B, except they would apply in all GRSG habitats. These are as follows:

- Completion of land health assessments
- Consideration of grazing methods and systems to reduce impacts on GRSG habitat

- Consideration of retiring vacant allotments
- Improved management of riparian areas and wet meadows
- Evaluation of existing introduced perennial grass seedings
- Authorization of new water developments and structural range improvements only when they would be beneficial to GRSG
- BMPs for West Nile Virus
- Fence removal, modification or marking

Together these actions would reduce the potential for negative impacts of grazing on GRSG habitat, described under Alternative A.

Cumulative Effects

Under Alternative F, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative F would provide an added benefit to GRSG. Therefore, Alternative F's direct and indirect effects of livestock grazing on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Energy Development

Direct and Indirect Effects

Under Alternative F wind energy development would be prohibited in PHMA, which would be closed to new fluid mineral leasing, nonenergy leasable mineral leasing, and mineral material sales. PHMA would be proposed for withdrawal from mineral entry; no NSO would be stipulated for leased fluid minerals, and a 3 percent disturbance cap would be applied.

Numerous conservation measures would be implemented to reduce impacts from mineral exploration and development in PHMA. Like Alternative B, Alternative F does not include specific management for locatable or salable or nonenergy minerals in GHMA. Unlike Alternative B, Alternative F directly addresses wind energy and fluid minerals development outside of PHMA: Wind energy would be sited at least 5 miles from active GRSG leks and at least 4 miles from the perimeter of GRSG winter habitat. Areas within 4 miles of active GRSG leks would be closed to new fluid minerals leasing. Alternative F, although similar to Alternative B, would reduce the impacts of energy development on GRSG and their habitat, as described under Alternative A, more so than Alternative B. This is because it addresses siting of wind energy and fluid minerals leasing outside of PHMA more thoroughly than Alternative B.

Cumulative Effects

Management actions associated with energy development under Alternative F would increase protection of GRSG habitat, primarily in PHMA, thereby benefiting GRSG rather than removing or fragmenting their habitat. Under Alternative F, in MZ IV, some of the current energy development management would continue; however, it would include additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative F's direct and indirect effects of energy development on

GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Recreation

Direct and Indirect Effects

Alternative F would follow the same general approach as Alternative A, but, like Alternative B, it would permit in PHMA only recreational SUAs that are neutral or beneficial to GRSG. In addition, in all occupied habitat, camping areas within 4 miles of active leks would be closed seasonally. The general recreational effects of Alternative F would be the same as those for Alternatives A and B, although Alternative F would be somewhat more protective of GRSG than Alternative B due to the seasonal closures.

Cumulative Effects

Management actions associated with recreation management under Alternative F would increase protection of GRSG habitat, thereby benefiting GRSG rather than removing or fragmenting habitat. Under Alternative F, in MZ IV, some of the current recreation management direction would continue, but additional emphasis on protecting sagebrush habitat and preventing GRSG disturbance would be included. Therefore, Alternative F's direct and indirect effects of recreation management on GRSG in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on GRSG.

Determination

Under Alternative F, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative F of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

Proposed Plan Alternative

Infrastructure

Direct and Indirect Effects

Under the Proposed Plan, PHMA and IHMA would be identified as ROW avoidance areas, as opposed to ROW exclusion areas for PHMA under Alternative B or all occupied habitat under Alternative C. PHMA and IHMA would be exclusion areas for wind and solar developments. New ROWs in PHMA would not be allowed except in accordance with the Anthropogenic Disturbance Exception Criteria outlined in the Proposed Plan. Transmission lines in PHMA would be allowed only as incremental upgrades in existing corridors, and perch deterrents would be used to reduce avian predation. In IHMA new ROWs could be considered if in accordance with the IHMA Anthropogenic Disturbance Development Criteria.

The Forest Service would colocate new ROWs with existing infrastructure and would aim to remove, bury, or modify existing power lines in these areas when possible. The Proposed Plan provides for a protective buffer from disturbance around leks in PHMA, IHMA and GHMA, based on the latest science (USGS 2014). The Forest Service would retain management flexibility to route ROWs to minimize overall impacts on GRSG habitat. Existing ROW corridors are preferred for collocating new ROWs but could not be widened more than 50 percent greater than the original footprint. These measures would protect GRSG habitat from fragmentation and disturbance of ROW construction, operations, and maintenance.

Under the Proposed Plan, land tenure adjustments would include retaining lands with GRSG habitat. PHMA and IHMA would be available only for exchanges that increase the extent or provide for connectivity of habitat. Retaining areas with GRSG would reduce the likelihood of habitat conversion to agriculture, urbanization, or other uses that would remove sagebrush habitat.

Cumulative Effects

Under the Proposed Plan, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall benefit to GRSG. Therefore, the Proposed Plan's direct and indirect effects of lands and realty management on GRSG and their habitat in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts.

Fire and Fuels

Direct and Indirect Effects

The Proposed Plan would focus resources to reduce wildfire in sagebrush areas and would maintain fuel breaks in PHMA and IHMA. Landscapes would be prioritized for fire prevention and fuels management in GRSG habitat to minimize the risk of wildfire in PHMA and IHMA. The use of prescribed fire in GRSG habitat would be avoided unless an evaluation of site-specific conditions showed a net benefit to GRSG.

The Proposed Plan includes an adaptive management strategy based on population and habitat triggers for each conservation area. Adaptive management would expand more restrictive management based on specific and measurable triggers relating to habitat and population metrics; for example, grazing may be restricted next to burn areas in order to restore habitat capable of supporting GRSG. Enhanced monitoring would be conducted in restoration areas. These policies are designed to limit the prevalence of wildfire in sagebrush areas and would reduce damage to GRSG habitat more than current management.

Cumulative Effects

Under the Proposed Plan, management actions associated with fire and fuels would increase protection of all GRSG habitats. Though such management could result in some negative impacts on GRSG, their overall effects would be neutral or beneficial. The cumulative effects of fire and fuels management actions under the Proposed Plan, when combined with the past, present, and reasonably foreseeable future actions, are similar to those described in Alternatives

B and D; they would not be substantial, change the existing population trend, or remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants

Direct and Indirect Effects

The Proposed Plan would reduce the impacts from invasive plants in these habitats compared with Alternative A, and monitoring and mitigation components of the Proposed Plan would help to ensure GRSG seasonal habitat objectives are met. Similar to those of Alternative B, vegetation management conservation measures under the Proposed Plan would prioritize restoration, including reducing invasive plants and monitoring and controlling invasive species after management projects. Applicable to all GRSG habitat management areas SFAs, the Proposed Plan contains specific guidelines for invasive annual grass management when GRSG habitat restoration projects are designed and road and roadway maintenance is planned.

Under the Proposed Plan, short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or the use of herbicides, could negatively impact individual sensitive species. Such impacts would be minimal as project level environmental review would be done and would include appropriate avoidance or minimization measures. The use of native seed would be favored in restoration under the Proposed Plan, as it would be under Alternatives B and D. Current Forest Service policy (FSM 2070.3) restricts the use of nonnative seed in restoration and prohibits the use of invasive species.

Cumulative Effects

Under the Proposed Plan, current invasive species management would continue, and the long-term beneficial impacts of improved habitat would continue to outweigh the short-term negative impacts of these activities on GRSG. Additional measures to conserve existing sagebrush habitat and restore degraded sagebrush habitat under the Proposed Plan would provide a further net benefit to GRSG and their habitat in all GRSG habitat management areas and SFAs. Therefore, the Proposed Plan's direct and indirect effects of invasive species management on GRSG in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts.

Conifer Encroachment

Direct and Indirect Effects

Conifer removal can provide immediate benefit to GRSG by restoring habitat quality; conversely, other vegetation management projects aimed at restoring sagebrush may aid GRSG over the long term but may not provide immediate habitat improvement. Under the Proposed Plan, the Forest Service would include treatment programs to reduce the likelihood of conifer encroachment and further improve GRSG abundance and distribution. Conifer removal would facilitate GRSG population and habitat recovery through methods determined appropriate for the terrain at the site-specific level. Thus, the vegetation management tools described in the Proposed Plan would help to reduce encroachment and improve GRSG habitat.

Cumulative Effects

Under the Proposed Plan, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate GRSG habitat conservation measures that directly address conifer encroachment. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on GRSG. Therefore, the Proposed Plan's direct and indirect effects of conifer encroachment management on GRSG and their habitat in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts.

Livestock Grazing

Direct and Indirect Effects

Under current management, 11,073,800 acres of NFS lands are open for livestock grazing on the six National Forests represented in the FEIS area. Essentially all of the sagebrush habitats occupied by GRSG are grazed by domestic livestock. Livestock grazing is managed through existing grazing plans, following their methods and guidelines to maintain ecological conditions according to Standards for Rangeland Health. The standards include maintaining healthy, productive, and diverse populations of native plants and animals. Direct impacts on GRSG have been reduced in some areas due to GRSG-specific management found in some conservation strategies or LUPs.

Range improvements are designed to meet both wildlife and range objectives and include building, modifying, or marking fences to permit wildlife passage and reduce the chance of bird strikes. Modifications may involve moving troughs, adding or changing wildlife escape ramps, or ensuring water is available on the ground for a variety of different wildlife species. Although not directly created to protect GRSG, these approaches would protect and enhance GRSG habitat by reducing the likelihood of surface disturbance in sensitive areas and ensuring brood-rearing habitat is available to GRSG.

Management under the Proposed Plan would add GRSG guidelines to grazing management plans in PHMA and IHMA. Land health assessments would be prioritized in PHMA and IHMA, and management changes would be tailored to specifically address GRSG habitat objectives. When an allotment becomes vacant, voluntary retirement of the allotment or grazing preference would be considered in PHMA if it would benefit GRSG habitat. In SFA, grazing permits would be prioritized for review in GRSG habitat.

Structural range improvements not beneficial to GRSG would be limited in GRSG habitat. These efforts would improve forage and cover in GRSG habitat to protect nesting GRSG from population loss due to predation. Similar efforts would apply to AML reevaluations in HMA for wild horse and burro populations. HMA would not be increased in PHMA or in IHMA without considering GRSG habitat objectives. Together, these efforts would reduce impacts on GRSG from grazing, such as loss of nesting cover, compared with Alternative A.

Cumulative Effects

Under the Proposed Plan, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS). Additional measures to conserve existing sagebrush habitat under the Proposed Plan would further minimize negative impacts on sensitive species that may occur in GRSG habitat. Therefore, the Proposed Plan's direct and indirect effects of livestock grazing in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on GRSG.

Energy Development

Direct and Indirect Effects

Nonenergy Leasable Minerals Management

Under the Proposed Plan, PHMA would be closed to leasing, while IHMA and GHMA would be open to leasing. This is in accordance with the Anthropogenic Disturbance Development Criteria, as well as RDFs, BMPs, buffers (based on the USGS [2014] study), and seasonal timing restrictions.

Locatable Minerals Management

Currently, National Forest System lands in the sub-region are generally open to locatable mineral development. Mitigation of effects on GRSG and its habitat are identified through the NEPA process approved plans of operation. Goals and objectives for locatable minerals are to provide opportunities to develop the resource while preventing undue or unnecessary degradation of National Forest System lands.

Lands currently withdrawn or recommended for withdrawal to locatable mineral entry under the General Mining Act of 1872 comprise 1,365,000 acres of PHMA and 433,200 acres of GHMA. This provide an increased level of protection to GRSG seasonal habitats. These acreages would not change under the Proposed Plan, except in SFA, where all acreage would be recommended for withdrawal from locatable mineral entry. In addition, the Proposed Plan would require operators to apply reasonable and appropriate RDFs and BMPs as Conditions of Approval when a Plan of Operations is submitted for approval. BMPs for locatable minerals removal would be applied to PHMA, IHMA, and GHMA as COAs in plans of operation. As no additional habitat would be withdrawn from mineral entry, there would continue to be effects on GRSG and their habitat. Use of BMPs, RDFs, and buffers under the Proposed Plan might reduce these impacts, as compared with Alternative A.

Salable Minerals Management

Under the Proposed Plan, PHMA would be closed to development, while IHMA and GHMA would be open, subject to Anthropogenic Disturbance Development Criteria. Closure would increase protection on habitat associated with leks. In addition, buffer zones, RDFs, and BMPs associated with development in GRSG habitat would provide improved protection from salable mineral development.

Fluid Minerals Management

Under the Proposed Plan, in unleased areas of PHMA and IHMA, an NSO stipulation would be applied without waivers or modifications; in SFA, NSO stipulations would apply without waiver, exception, or modification. Outside SFA, exceptions to NSO would be considered under certain criteria. GHMA would be open to leasing with BMPs, RDF, and buffer zones. Restrictive stipulations would increase protection of habitat associated with leks by avoiding surface disturbance during sensitive times; this would reduce the impacts of mining on GRSG habitat. Mitigation requirements would be implemented to ensure a net conservation gain for GRSG.

Unlike Alternative B, the Proposed Plan would directly address solar and wind energy development. Similar to Alternative D, in PHMA, the Proposed Plan would prohibit new wind and solar energy development. Alternative D and the Proposed Plan would make IHMA avoidance areas and GHMA would remain open for wind and solar energy development in Idaho; by contrast, only the Proposed Plan would make GHMA avoidance areas for wind and solar energy development in Montana. The Proposed Plan would reduce negative impacts from energy development on GRSG and their habitat, relative to Alternatives A, B, and D.

Cumulative Effects

Under the Proposed Plan, some of the current energy development would continue in MZ IV; however, additional measures would conserve existing sagebrush habitat and provide an overall long-term benefit. Therefore, the Proposed Plan's direct and indirect effects on GRSG and their habitat in MZ IV from the management of energy development, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts.

Recreation

Direct and Indirect Effects

The Proposed Plan would apply measures to reduce the potential negative impacts of recreation on GRSG. Similar to Alternative D, in all GRSG habitats, terms and conditions in new and existing permits and operating plans should be included to protect and restore GRSG habitat; however, the Proposed Plan extends these measures to SFAs. In PHMA, IHMA, SFAs, the Proposed Plan does not authorize temporary recreation uses that results in loss of habitat or would have negative impacts beyond 5 years on GRSG or their habitats.

The Proposed Plan would not approve new or expanded recreation facilities, such as roads, trails, and campgrounds, including SUAs for facilities and activities, unless the development would results in a net conservation gain to GRSG and their habitats or the development were required for visitor safety. The Proposed Plan would reduce the general impacts of recreation on GRSG that were described under Alternative A. Although the types of impacts on GRSG would be similar to Alternatives A, B, and D, the extent of impacts in GRSG habitat would be lower under the Proposed Plan, due to its greater extent of restrictions by delineating SFAs.

Cumulative Effects

Management actions associated with recreation under the Proposed Plan would increase protection of PHMA, IHMA, GHMA, and SFAs in MZ IV. They would minimize the negative impacts of recreation on sensitive species that occur in those areas. Therefore, when combined with the past, present, and reasonably foreseeable future actions, recreation management in MZ IV, the Proposed Plan would not substantially increase negative impacts on GRSG.

Determination

Under the Proposed Plan, conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement Proposed Plan may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the GRSG in the plan area.

B. Sagebrush-Associated Species

Greater Sage-Grouse as an Umbrella Species

GRSG populations require large landscapes and specific habitat conditions at broad scales to meet their seasonal life requisite requirements. Rowland et al. (2010) and Hanser and Knick (2006) provide documentation that GRSG habitats at broad scales have substantial overlap with habitats of other species similarly associated with sagebrush and sagebrush-steppe communities.

The plan amendment is specially designed to provide protections for GRSG and their habitats. Although individual species have specific habitat requirements at finer scales that differentiate their use of habitats, habitat protections for GRSG will benefit other species similarly dependent on these habitats. The structure of this biological evaluation reviews the efficacy for conservation and management actions for GRSG, and then evaluates the adequacy of these protections for other sensitive species, including those associated with sage-brush habitats

For this analysis, the following species have been grouped as sagebrush-associated species (SAS): bighorn sheep (*Ovis Canadensis*), Great Basin pocket mouse (*Perognathus parvus*), pygmy rabbit (*Brachylagus idahoensis*), Columbia spotted bat (*Euderma maculatum*), Townsend's western big-eared bat (*Corynorhinus townsendii*), Columbian sharp-tailed grouse (*Tympanuchus phasianellus*), boreal toad (*Anaxyrus boreas boreas*), and western toad (*Bufo boreas*). This is because of the similar habitats they occupy and the programmatic nature and landscape scale of this analysis. Though each of the species may not depend completely on sagebrush for every life history stage, they are all strongly associated with sagebrush habitats. The landscape-scale effects of the proposed conservation measures for each program area under each alternative will be analyzed generally and collectively for this group of species.

Bighorn sheep (*Ovis Canadensis*)

Distribution (R1 Sensitive—Beaverhead-Deerlodge National Forest)

Bighorn sheep use the Lima Tendoy landscape in PHMA and GHMA habitat (southwest portion of the Beaverhead-Deerlodge National Forest near the Idaho border) as part of their winter range.

Habitat Association and Threats

Most bighorn populations in Montana occur in the western portion of the state. The Beaverhead-Deerlodge National Forest is in the mountain foothills ecological region. Topography varies, from gently undulating foothills to rugged mountainous terrain, with elevations ranging from 4,000 to 11,000 feet. Vegetation in the foothills is a variety of big sage, bitterbrush, mountain mahogany, and juniper, interspersed among bunchgrass communities dominated by bluebunch wheatgrass and Idaho fescue. Riparian areas support cottonwood, aspen, willow, and hawthorn. Conifer forests of Douglas-fir, ponderosa pine, lodgepole pine, subalpine fir, and whitebark pine

become prevalent with increasing elevation. Subalpine and alpine vegetation is restricted to elevations above about 8,500 feet. In east-central Idaho and southwest Montana, bighorn sheep generally make use of sagebrush steppe near escape terrain during the winter and spring.

The main threat to this species is disease from contact with domestic sheep, but other issues include habitat deterioration, loss, and fragmentation from residential and resort development, highway development, livestock grazing, forest succession, noxious weeds, forage competition with other wild ungulate species, and human disturbance on critical winter and lambing ranges.

Great Basin pocket mouse (*Perognathus parvus*)

Distribution (R1 Sensitive—Beaverhead-Deerlodge National Forest)

The Great Basin pocket mouse is found throughout the Great Basin and adjacent regions of the West, from south-central British Columbia southward through eastern Washington and Oregon to southern California, Nevada, northern Arizona, western Utah, southern Idaho, southwestern Montana, and southwestern Wyoming. It usually occurs below 8,200 feet. In Montana the species is limited to the southwestern portion; it is known to occur in Beaverhead County and is suspected in Madison County. It is limited to arid areas in southwestern Montana, which is on the periphery of the species' range (USDA Forest Service 2009). The Beaverhead-Deerlodge National Forest is on the periphery of the range of the pocket mouse and contains limited pocket mouse habitat. Within the analysis area, the most likely areas to find the pocket mouse are the southern end of the Beaverhead-Deerlodge National Forest.

Habitat Associations and Threats

Very little is known about this pocket mouse in Montana, where occupied habitats are arid and sometimes sparsely vegetated. They include grassland-shrubland with less than 40 percent cover, stabilized sandhills, and landscapes with sandy soils, more than 28 percent sagebrush cover, and 12- to 78-inch shrub height.

The primary threat to the pocket mouse is direct habitat alteration, particularly conversion of habitat to hay fields and row crops. Another possible threat is the encroachment of conifers into grassland/shrubland habitats.

Pygmy Rabbit (*Brachylagus idahoensis*)

Distribution (R1 Sensitive—Beaverhead-Deerlodge National Forest; R4 Sensitive—Caribou-Targhee National Forest, Salmon-Challis National Forest, Sawtooth National Forest)

Montana lies on the northeastern edge of pygmy rabbit distribution. There are confirmed records dating to 1918 from three southwestern counties (Beaverhead, Jefferson, Madison), with most of the Montana range in Beaverhead County. Montana records are between 4,500 and 6,700 feet. Forest Service surveys in the north Big Hole detected three rabbits on the Mudd Creek allotment, approximately 17 miles north of Wisdom, Montana (USDA Forest Service 2009). These detections were below 6,300 feet. Rabbits have also been seen in the Reservoir Creek drainage on BLM-administered lands southwest of Bannack at approximately 6,400 feet. This location is 3 miles east of the nearest National Forest System lands. It is reasonable to expect to find this

species on Forest System lands below 6,700 feet. Habitat at these elevations is very limited on Forest System lands, less than 1 percent, mainly south of an east-west line below Dillon. There are no detections north of Melrose.

Pygmy rabbits occur on the Challis-Yankee Fork, Leadore, and Lost River Ranger Districts of the Salmon-Challis National Forest. Documented historic records for pygmy rabbits on the Caribou portion of the Caribou-Targhee National Forest are from near Pocatello, Fort Hall, and Downey, all at elevations below the National Forest boundary; there are no known occurrences within the forest. The pygmy rabbit potentially occurs on the west side of the Caribou National Forest in dense sagebrush stands, but current distribution is uncertain. On the Targhee National Forest, suitable pygmy rabbit habitat occurs only on the Dubois Ranger District.

Pygmy rabbits have been documented in Grouse Canyon in the Crooked Creek drainage and in the Fritz Creek drainage of Medicine Lodge. They are suspected to occur wherever there is suitable habitat, including Birch Creek and east of Medicine Lodge. In addition, the Idaho Natural Heritage Database contains numerous pygmy rabbit detections next to the ranger district. The predicted range for the pygmy rabbit in the Sawtooth National Forest includes the Ketchum Ranger District, the southern half of the Fairfield Ranger District, the southeastern portion of the Sawtooth National Recreation Area, and the entire Minidoka Ranger District. Extensive surveys for pygmy rabbits have not been conducted on the Sawtooth National Forest.

Habitat Associations and Threats

Pygmy rabbits require sagebrush habitats. Tall clumps of big sage are particularly desirable, with shrub canopy cover greater than 21 percent. Since they make extensive use of burrows, many of their own construction, they also need loose, friable soil generally deeper than 14 inches. Pygmy rabbits eat a variety of grasses and forbs and switch to almost exclusively sagebrush during the winter. The preferred habitat in Montana appears to be gently sloping or level floodplains where adequate sagebrush and appropriate soils exist. However, many occupied sites have marginal sagebrush cover and shallow soils. Pygmy rabbits are also reported to frequent areas in Idaho supporting greasewood.

The primary cause for population declines is due to the loss, alteration, and fragmentation of sagebrush-steppe habitat from increased fire frequency, extent, and severity, encroachment of habitat by invasive plant species, and vegetation treatments that remove sagebrush. Fragmentation of sagebrush communities also poses a threat to populations of pygmy rabbits because dispersal potential is limited.

Columbia spotted bat (*Euderma maculatum*)

Distribution (R1 Sensitive—Beaverhead-Deerlodge National Forest; R4 Sensitive—Boise National Forest, Caribou-Targhee National Forest, Salmon-Challis National Forest, and Sawtooth National Forest)

This species is known to occur from central Mexico, north to southern British Columbia, and east to Texas. Although roost habitats and sites have not been documented in Montana, rock outcrops abound on the Beaverhead-Deerlodge National Forest, including limestone, which can provide excellent roosting habitat. Ponderosa pine forest is restricted to the northwest portion of the Beaverhead-Deerlodge National Forest; cliff faces and talus slopes are widespread, as are

sagebrush and riparian areas. Three detections have been recorded on the Beaverhead-Deerlodge National Forest along the eastern edge of the Pioneer Mountains landscape in the GRSG analysis area (USDA Forest Service 2009).

This species has been found in southwest Idaho, south of the Snake River and from Twin Falls County north to the Middle Fork of the Salmon River (Nutt et al. 2010). Roosting habitat (cracks in steep rocky outcrops and cliff faces) occurs in the Boise National Forest, in steep basalt and limestone canyons, and also outside the national forest (Nutt et al. 2010). There have been no documented occurrence of spotted bats in the Boise National Forest, but surveys have been limited, and population trends in the Boise National Forest are unknown. Based upon forest records, there is one record of spotted bats in the Middle Fork Ranger District in the Frank Church – River of No Return Wilderness Area on the Salmon-Challis National Forest) that does not overlap the range of the GRSG, and one in the Valley Creek watershed next to the Challis-Yankee Fork Ranger District. It is unclear if the latter overlaps with GRSG habitat. The spotted bat has not been documented on the Caribou-Targhee, and Sawtooth National Forests, but occurrence data exists for areas near the Sawtooth National Forest and suitable habitat is available there.

Habitat Associations and Threats

Spotted bats have been encountered or detected most often in open arid habitats dominated by Utah juniper and sagebrush, sometimes intermixed with limber pine or Douglas-fir, or in grassy meadows in ponderosa pine savannah. Cliffs, rocky outcrops, and water are other attributes of sites where spotted bats have been found, typical for the global range. This species is sensitive to human disturbance during roosting.

Townsend's big-eared bat (*Corynorhinus townsendii*)

Distribution (R1 Sensitive—Beaverhead-Deerlodge National Forest; R4 Sensitive—Boise National Forest, Caribou-Targhee National Forest, Salmon-Challis National Forest, Sawtooth National Forest)

Elevation range for this species extends from near sea level to at least 10,826 feet in some areas. The complete extent of the range of Townsend's big-eared bat in Montana is unknown due to the limited survey across many areas. It has been documented in over 20 counties, at elevations of 1,968 to 7,820 feet. There are 11 detections in southwest Montana through 2008 that border the Beaverhead-Deerlodge National Forest. One detection is from 1997 in the Dillon Ranger District's Bloody Dick drainage, and one is near the forest boundary in the Argenta area. Of these detections there are only two since 2000, with none on Beaverhead-Deerlodge National Forest lands. The species was not detected it the 2008 R1 bat survey of the 13 evaluated abandoned mine shafts in the Beaverhead-Deerlodge National Forest's Delmoe Lake and Pipestone Pass areas; however, suitable habitat was found at 2 of the 13 sites.

Although population trends are not well documented, populations in Idaho appear to be declining. Although this species has been identified at several locations near the Boise National Forest, Idaho Department of Fish and Game Animal Conservation Database (2009 *in* Nutt et al. 2010) records identify no Townsend's big-eared bat occurrences on the forest; Townsend's big-eared bat population trends for the forest are unknown.

Although the Townsend's big-eared bat has not been documented on the Targhee portion of the Caribou-Targhee National Forest, winter surveys of hibernating bats conducted in 1984 and 1985 on the Idaho National Engineering Laboratory, near the western portion of the forest, detected the species hibernating in lava tube caves. Cave and abandoned mine surveys in the Caribou portion of the Caribou-Targhee National Forest have found Townsend's big-eared bats using these structures for both summer roosts and winter hibernacula.

Use has been documented in the Bear River range, Preuss Range, Portneuf Range and Elkhorn Mountains. Of 18 caves and mines surveyed on the Montpelier Ranger District during the winter, 11 were found to have low numbers of western big-eared bats; of 12 caves and mines surveyed in the summer, 5 had low number. No large concentrations were found in any season. Based upon forest records, this species occurs on the North Fork, Salmon-Cobalt, and Lost River Ranger Districts of the Salmon-Challis National Forest; abandoned mine land surveys have found colonies in the Lost River, Challis-Yankee Fork, Salmon-Cobalt, Leadore, and North Fork Ranger Districts. Of these areas, GRSG habitat overlaps only the Lost River Ranger District and small portions of the Salmon-Cobalt, Challis-Yankee Fork, and Leadore Ranger Districts.

The Sawtooth National Forest contains source habitat throughout the low, mid-, and high elevations. Although Townsend's big-eared bats have been documented in the Sawtooth National Forest, there are only a few point location occurrence data shown for this species. The forest provides breeding, hibernating, and generally year-round habitat for Townsend's big-eared bat, but its population size and trend data are unavailable for the Sawtooth National Forest.

Habitat Associations and Threats

In western Montana the Townsend's big-eared bat is most closely associated with cavernous habitat and rocky outcrops of sedimentary or limestone origin, which it uses for roosting. In old-growth forests, large-diameter hollow trees may be used for roosting, and it is known to use caves, buildings, and tree cavities for roosts. In Idaho, most of the big-eared bat records have been in lower elevations outside of large expanses of forest cover.

Threats generally are loss of habitat due to management activities, vandalism, and disturbance of maternity roosts and hibernacula. Managing forested types to produce a sufficient number of snags of the appropriate heights would benefit this species since it uses snags for night roosting.

Columbian sharp-tailed grouse (*Tympanuchus phasianellus*)

Distribution (R4 Sensitive—Boise National Forest, Caribou-Targhee National Forest, Sawtooth National Forest)

The Columbian sharp-tailed grouse occurs in southwestern Canada, Washington, Oregon, Idaho, Montana, and Wyoming. It is not known if this bird nests on the Boise National Forest, but it is assumed that some do. Idaho Department of Fish and Game records show one sharp-tailed grouse record for that forest (Nutt et al. 2010).

Most of the Caribou-Targhee National Forest is at a higher elevation than where this species is typically found. While there are numerous leks documented next to the Caribou portion of the Caribou-Targhee National Forest, none are on its lands. Sagebrush and grassland habitats in the forest may provide nesting, brood-rearing, and winter habitat. Survey data for attendance on leks

next to the Caribou-Targhee National Forest is very patchy. In the forest, there appears to be habitat for sharp-tailed grouse in the Shotgun Valley, along the western boundary of the Ashton-Island Park District (similar to GRSG) and on the southern portions of the Dubois District east of I-15. Habitat in the forest is likely for brood rearing, as opposed to for nesting or wintering.

Columbian sharp-tailed grouse populations occur in three sub-basins in the Sawtooth National Forest: Curlew Valley, Raft River, and Salmon Falls Creek. Sharp-tailed grouse populations are small and isolated, and this species is anticipated to use adjacent BLM-administered and private lands. Forest Service-administered lands are believed to provide important fall and wintering requirements, and these habitats are generally in the mountain shrub communities. It is not known definitively if this species nests on Forest Service-administered lands, but it is assumed that some do.

Habitat Associations and Threats

Sharp-tailed grouse are found in low-elevation native shrub-grassland year-round. Abundant grass composition appears to be important in shrub/grassland communities during all life stages. Through the summer, the shrubs are used for cover and the grass and forbs for food, including insects that are available in these habitats. During the winter, tall shrubs other than sagebrush (serviceberry, chokecherry, bitterbrush, bitter cherry, hawthorn, and aspen) increase in importance for food supply because they are above snow cover and riparian cover types become a critical habitat component. These habitats are referred to as mountain shrub communities and shrub-dominated riparian areas, and they include areas with moderate to high canopy cover.

Much of the sharp-tailed grouse's low-elevation historical habitat has been converted to agriculture. Another concern has been the extensive modification of some of these communities from wildfire.

Western boreal toad (*Anaxyrus boreas boreas*)

Distribution

Western boreal toads have been observed on the Boise, Ashton, Island Park, Palisades, and Teton Districts of the Caribou-Targhee National Forest. Their distribution overlaps with that of the GRSG on the Boise Ranger District and is near it in the Ashton-Island Park District.

Habitat Associations and Threats

Boreal toads are associated with wetlands, forests, woodlands, sagebrush, meadows, and floodplains in the mountains and valleys. Usually they inhabit wetlands near ponds, lakes, reservoirs, rivers, and streams. They require three main habitat components: shallow wetlands for breeding, terrestrial habitats with vegetative cover for foraging, and burrows for winter hibernation. Boreal toads have a low reproductive output.

Threats to boreal toads are chytrid fungus (*Batrachochytrium dendrobatidis*), wetlands acidification, ozone layer thinning, timber harvesting that causes sedimentation, livestock grazing in and around riparian areas, pesticides and herbicides, and introduced species that prey on toads or create competition for resources or are vectors for pathogens. Any activity that alters mountain wetland habitats can affect boreal toad populations.

Western toad (*Bufo boreas*)

Distribution (R1 Sensitive—Beaverhead-Deerlodge National Forest)

In the last 25 years, western toads have undergone population crashes in Colorado, Utah, southeast Wyoming, and New Mexico and have declined in the northern Rocky Mountains. Surveys in the late 1990s revealed they were absent from a number of areas they historically occupied. While they remain widespread across the landscape, they appear to be occupying only 5 to 10 percent or less of the suitable habitat.

A systematic inventory of standing water bodies in 50 randomly chosen sub-watersheds in and next to the Beaverhead-Deerlodge National Forest demonstrated similar findings. In the sub-watersheds where they were found, they were detected and breeding in only 7 percent of the suitable habitats. What this represents with regard to historic distribution and abundance in this area is not known, since there is no baseline data to compare against. However, based on declines in other western states, it seems reasonable to assume that they are depressed and that a primary cause is disease.

Habitat Associations and Threats

The western toad is largely terrestrial and is found in a variety of habitats, from valley bottoms to high elevations. They breed in lakes, ponds, and occasionally in slow-flowing streams. They prefer shallow areas with muddy bottoms.

The extent of range-wide threats is not known with certainty, but there appear to be multiple causes contributing to the range-wide trend; disease and parasites appear to be contributing factors of population declines. Roads, water development, fire suppression, timber harvest, mining, grazing, and recreation have been the major human-caused agents of change for water resources.

Alternative A

<u>Infrastructure</u>

Direct and Indirect Effects

Existing LUP direction would apply under Alternative A. There would be no changes to the current National Forest System infrastructure, including power lines, wind turbines, communications towers, fences, or roads. Permitted ROWs would continue to allow construction, maintenance, and operation that could result in habitat loss, fragmentation, or degradation of sagebrush habitat or to result in barriers to migration corridors or seasonal habitats. Construction and maintenance of infrastructure would continue to lead to higher short-term concentrations of human noise and disturbance, which could disrupt reproduction, foraging, or other behaviors, cause young abandonment temporarily displace individuals of SAS species.

These activities could also lead to new infestations of noxious or invasive weeds and an increase in edge habitat. Existing and new power lines, wind turbines, communications towers, fences, and vehicles traveling on associated roads would continue to pose a collision hazard to SAS or to provide potential perching and nesting habitat for avian predators. Though proponents of most

projects would be forced to mitigate or minimize impacts, this alternative would likely have the greatest impact on SAS and their habitat.

Cumulative Effects

The baseline date for the cumulative impacts analysis for SAS is 2012. The temporal scope of this analysis is a 20-year planning horizon; land use planning documents are generally evaluated on a 5-year cycle. The temporal boundary for cumulative effects analysis for SAS is WAFWA MZ IV (Snake River Plain). This is because all of the Idaho/Montana planning area, with the exception of a small portion of privately held lands in MZ II in the southeastern corner of Idaho, is in MZ IV; this area is large enough to encompass larger-ranging species, such as bighorn sheep.

Current infrastructure management activities would continue under Alternative A. ROW exclusion or avoidance areas would not be instituted as they would be under Alternatives B, C, D, E1, E2 or F. Therefore, Alternative A's direct and indirect effects of infrastructure management, and in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of sagebrush habitat and disturbance for SAS in MZ IV (refer to the Cumulative Effects section of the FEIS).

Fire and Fuels

Direct and Indirect Effects

Alternative A would continue to manage wildfire and prescribed burns under current direction. This would have the fewest restrictions for fire and fuels management and a high potential for vegetation disturbance. Prescribed burns could be used in sagebrush habitat where needed to control fuel loading. Policies would not prioritize protection or restoration of mature sagebrush habitat. Increased human activity and noise associated with wildland fire suppression and prescribed fire in areas occupied by SAS could disrupt nesting, breeding, or foraging behavior. IHMA could be removed or degraded because of the use of heavy equipment or hand tools. Other potential impacts may include injuring or killing eggs, young, or individuals of less mobile species or change species movement patterns from areas devoid of vegetation.

In addition, suppression may initially result in higher rates of juniper encroachment in some areas, eliminating habitat for SAS. In phase 1 of encroachment, fuel loadings remain consistent with the sagebrush understory. As juniper encroachment advances (phases 2 and 3) and the understory begins to thin, the depleted understory causes the stands to become resistant to wildfire and further alters fire return intervals. During years of high fire danger, the resulting heavy fuel loadings in these stands can contribute to larger-scale wildfires, which have a particularly negative effect on pygmy rabbit and Columbia sharp-tailed grouse habitat, and their extreme behavior can confound control efforts.

Cumulative Effects

Current wildfire suppression and fuels management would continue under Alternative A. The limitation or prohibition of prescribed fire in sagebrush habitats and the sagebrush protection emphasis during wildland fire operations would not be instituted as it would be under Alternatives B, C, D, E1, E2, and F. Under Alternative A, the direct and indirect effects, in

conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of sagebrush habitat from wildfire in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Alternative A would continue the management of invasive weeds under current direction. To reduce the likelihood of invasive weed spread and the extent of current infestations, integrated weed management techniques are used, including mechanical, manual, chemical, and biological control. Coordinated weed management areas would remain in effect, and firefighting vehicles would be washed before deployment. These policies would limit impacts from spread of weeds as effectively as possible under current resource constraints. The spread of weeds would continue to pose a substantial threat to the planning area by altering plant community structure and composition, productivity, nutrient cycling, and hydrology that could fragment or degrade SAS habitat. Weeds may cause declines in native plant populations, including sagebrush habitat, through competition or displacement and, in cases where monocultures occur, eliminate vegetation that SAS use for food and cover. In addition, invasives can fragment sagebrush habitat or reduce habitat quality. Invasives can also create long-term changes in ecosystem processes, such as fire-cycles (see Fire and Fuels above).

Current treatments and active vegetation management typically focus on vegetation composition and structure for fuels management, habitat management, and productivity manipulation for the following: improving the habitat and forage conditions for ungulates and other grazers, using surface soil stabilization to increase productivity, and removing invasive plants. Management of vegetation resources to protect GRSG would alter vegetative communities by promoting increases in sagebrush height and herbaceous cover and vegetation productivity. Treatments designed to prevent encroachment of shrubs, nonnative species, or woody vegetation would alter the condition of native vegetation communities by changing the density, composition, and frequency of species in plant communities.

The intent of these management programs is to improve rangeland condition and enhance sagebrush ecosystems. Vegetation treatments could negatively impact SAS and sagebrush habitat in the short term, primarily through disturbance and vegetation removal; however, the treatments would result in long-term benefits for SAS species and would improve sagebrush habitat.

Cumulative Effects

Under Alternative A, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants management treatments are mechanical, manual, chemical, and biological control. These would continue and the short-term negative impacts of these activities on SAS and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. Therefore, Alternative A's direct and indirect effects of invasive plants management on SAS in MZ IV would be largely beneficial. When combined with past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Conifer Encroachment

Direct and Indirect Effects

Expansion of conifer woodlands, especially juniper, displaces shrubs, grasses, and forbs through direct competition for resources. The pocket mouse, in particular, may be negatively affected by changes in sagebrush habitat due to conifer encroachment. Juniper expansion is also associated with increased bare ground and increased potential for erosion. Mature trees may offer perch sites for avian predators. Alternative A does not directly address conifer encroachment. However, habitat restoration and vegetation management policies described under Invasive Plants and fuels treatments described under Fire and Fuels would likely also reduce juniper encroachment.

Cumulative Effects

Current conifer encroachment management would continue under Alternative A, and the measures addressing conifer encroachment would not be instituted as they would be in several of the action alternatives. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of sagebrush habitat from conifer encroachment in MZ IV (refer to the Cumulative Effects section of the FEIS).

Livestock Grazing

Direct and Indirect Effects

Under Alternative A, livestock grazing would be managed as it is now. There would be no change in the locations, numbers, timing, or method of livestock grazing in the national forests. Depending on site-specific management, beneficial or adverse impacts of grazing on SAS or their habitat would continue. Grazing practices can benefit SAS by reducing fuel load, protecting intact sagebrush habitat, and increasing habitat extent and continuity. However, grazing at inappropriate intensity, season, or location may alter or degrade sagebrush ecosystems or reduce cover and structure, which could reduce the suitability of reproductive or foraging habitat.

In addition, grazing can lead to the following:

- Degrade meadow/wetland/spring/stream habitat crucial for riparian-dependent SAS, such as bats, toads and Columbia sharp-tailed grouse
- Cause competition with forb-dependent SAS species, such as pygmy rabbit and sharp-tailed grouse
- Compact soil, affecting burrowing species, such as pygmy rabbit
- Trample less mobile SAS or their nests
- Disturb reproductive, foraging, or other critical behaviors
- Temporarily displace SAS, particularly during movement or trailing operations

Under current direction, the Forest Service may use a number of mechanisms to reduce the potential for negative impacts from grazing, if necessary. The only planning-level decision available is to decide where areas would be open and closed to livestock grazing. Future impacts

would be eliminated in areas closed to grazing, but past impacts would likely persist for some time, and closing grazing may result in other harmful impacts.

Other changes in management would occur at the implementation level during the permit renewal process, which occurs every ten years and for which subsequent NEPA analysis would be conducted. At the implementation level, changes in grazing practices or systems can be considered, which could reduce grazing intensity or change the season of use, for example. In addition, changes in grazing management in riparian and wet meadows can reduce impacts in these important habitats.

Cumulative Effects

Under Alternative A, in MZ IV, livestock grazing would continue to be managed through existing grazing plans. Methods and guidelines from the existing plans would be followed to maintain ecological conditions according to Standards for Rangeland Health. Therefore, Alternative A's direct and indirect effects of livestock grazing on SAS in MZ IV would be largely neutral. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Energy Development

Direct and Indirect Effects

Under Alternative A, all mineral leasing and development and wind energy development would continue to be managed under current direction. As such, this alternative would have the most direct and indirect impacts on SAS and their habitat and disturb reproductive, foraging, or other critical behaviors or displacement. Specifically, these impacts are as follows:

- Habitat loss
- Degradation and fragmentation by roads, pipelines, and power lines
- Higher levels of noise
- Increased presence of roads and humans
- Larger number of anthropogenic structures in an otherwise open landscape

Cumulative Effects

Management under Alternative A would maintain the current acreage open to energy development and current energy development. Areas would not be closed to energy development as they would be under most of the action alternatives. Therefore, Alternative A's direct and indirect effects of energy and locatable minerals development, in conjunction with the past, present, and reasonably foreseeable future actions, may increase the loss and fragmentation of sagebrush habitat from energy and locatable minerals development in MZ IV (refer to the Cumulative Effects section of the FEIS).

Recreation

Direct and Indirect Effects

Under this alternative there would be no changes to the current National Forest System roads, transportation plan, or recreation management. Under current management, travel on Forest Service-administered lands is limited to designated roads. There would be minimal seasonal restrictions. In general, the more acres and miles of routes that are designated in an area, the greater the likelihood of disturbance of SAS and fragmentation of SAS habitat. In addition, less restrictive travel conditions usually mean higher concentrations of human use next to motorized routes. This can cause disruption of nesting activities, abandonment of young and temporary displacement, including from critical winter ranges. In addition, impacts from roads may include habitat loss from road construction, noise disturbance from vehicles, and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats. This alternative has the highest potential to impact SAS due to the lack of restrictions on activities that cause these effects.

Cumulative Effects

Current recreation management would continue under Alternative A. The limitation on recreation disturbances to GRSG would not be instituted as it would be under the action alternatives. Under Alternative A, the direct and indirect effects from recreation management, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of sagebrush habitat and disturbance to SAS in MZ IV (refer to the Cumulative Effects section of the FEIS).

Determination

Under the current management direction, existing conservation measures limit some, but not the majority of impacts to GRSG and GRSG habitat. Given the main threats to bighorn sheep, Great Basin pocket mouse, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, and western toad, and that these species are not sagebrush-obligate species, Alternative A of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket mouse, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area. Although the pygmy rabbit is a sagebrush-obligate species, given the limited distribution of the species on National Forest System lands, Alternative A of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the pygmy rabbit in the plan area.

Alternative B

Infrastructure

Direct and Indirect Effects

Alternative B places a 3 percent disturbance threshold on new ROWs or SUAs in PHMA. All PHMA would be managed as exclusion areas and GHMA would be managed as avoidance areas for new ROW and SUA projects. Alternative B would require collocation of new ROWs or

SUAs with existing infrastructure. It would remove, bury, or modify power lines in PHMA, having the potential to disturb SAS in the short term but reducing the potential for collisions with aerial species in the long term. In PHMA, new facilities would be collocated with existing facilities where possible. Existing or realigned roads would be used to access valid ROWs or those that are not yet developed. New roads would be constructed to the absolute minimum standard necessary if valid existing rights could not be accessed via existing roads.

This alternative would maximize connectivity and minimize loss, fragmentation, degradation, and disturbance of sagebrush habitats in PHMA by power lines, communication towers, and roads. SAS outside PHMA would likely experience little change in direct or indirect effects. However, if this measure ended up concentrating new infrastructure development outside PHMA rather than just reducing it in PHMA, the extent of impacts on SAS outside PHMA could increase under Alternative B relative to Alternative A. general impacts from infrastructure on SAS would be similar to those described for Alternative A.

Cumulative Effects

Management actions associated with infrastructure management under Alternative B would increase protection of sagebrush habitat, thereby benefiting SAS rather than removing or fragmenting habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current infrastructure management operations would continue; however, it would include additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative B's direct and indirect effects on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Fire and Fuels

Direct and Indirect Effects

Under Alternative B, suppression would be prioritized in PHMA to protect mature sagebrush habitat. Suppression would be prioritized in GHMA only where fires threaten PHMA. Suppression-related juniper encroachment discussed in Alternative A could increase in some areas under Alternative B. This would eliminate habitat for SAS and eventually result in heavy fuel loadings. This could contribute to larger-scale wildfires that have a particularly negative effect on pygmy rabbit and Columbia sharp-tailed grouse habitat.

Alternative B does not include any other specific management for wildland fire management in GHMA. Fuels treatments would be designed to protect sagebrush ecosystems by maintaining sagebrush cover, implementing fuel breaks, applying seasonal restrictions, protecting winter range, and requiring use of native seeds. Post-fuels treatments would be designed to ensure long-term persistence of seeded areas and native plants and to maintain 15 percent canopy cover. Fuels treatments would also include monitoring and controlling invasive species; fuels management BMPs would incorporate invasive plant prevention measures.

These measures would benefit SAS species negatively impacted by invasive species, such as bighorn sheep and pygmy rabbit, by eliminating competition with or exclusion of forage species. Overall, these conservation measures would reduce the threat of wildfire to sagebrush compared

to Alternative A, although the general effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

Management under Alternative B for fire and fuels management would increase protection of sagebrush habitat, primarily in PHMA; this would benefit SAS rather than remove or fragment habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the FEIS), current wildfire suppression would continue; however, it would include additional emphasis on protecting sagebrush habitat during suppression and suppression planning and staging for maximum protection of sagebrush habitat.

Fuels treatment activities would focus on protecting sagebrush habitat, primarily in PHMA. Therefore, Alternative B's direct and indirect effects of fire on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Under Alternative B, weeds would continue to be controlled under current direction (see Alternative A). However, vegetation management conservation measures would benefit weed control by prioritizing restoration, including reducing invasive plants; in turn, this would benefit SAS species, such as bighorn sheep and pygmy rabbit, negatively impacted by invasive species. The BLM and Forest Service would require the use of native seeds and would design post-restoration management to ensure the long-term persistence of restoration and would consider climate change when determining species for restoration. Invasive species would also be monitored and controlled after fuels treatments and at existing range improvements.

Alternative B incorporates fewer invasive plant management measures in GHMA compared to PHMA. However, many of the same habitat restoration and vegetation management actions would be applied, including prioritizing the use of native seeds. Together, these measures would reduce impacts on SAS from invasive plants, as described under Alternative A, although the general effects of the treatments would be the same.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the FEIS), current mechanical, manual, chemical, and biological control of invasive plants would continue. The short-term negative impacts of these activities on SAS and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. Additional emphasis on protecting sagebrush habitat, under Alternative B, would provide an added benefit to sagebrush habitat. Therefore, Alternative B's direct and indirect effects of invasive plants management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Conifer Encroachment

Direct and Indirect Effects

As under Alternative A, Alternative B does not directly address conifer encroachment. However, the vegetation management conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would also likely reduce juniper encroachment and the general effects on SAS habitat, as described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV, vegetation management conservation measures would be instituted for invasive plants and fuels treatments that could reduce juniper encroachment. This is opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative B's direct and indirect effects of conifer encroachment management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Livestock Grazing

Direct and Indirect Effects

Alternative B would implement a number of beneficial management actions in PHMA to incorporate GRSG habitat objectives and management considerations into livestock grazing management. These are as follows:

- Completion of land health assessments
- Consideration of grazing methods and systems to reduce impacts on sagebrush habitat
- Consideration of retiring vacant allotments
- Improved management of riparian areas and wet meadows
- Evaluation of existing introduced perennial grass seedings
- Authorization of new water developments and structural range improvements only when beneficial to GRSG
- BMPs for West Nile Virus
- Fence removal, modification, or marking

Several management actions to reduce impacts from livestock grazing on GRSG GHMA would be incorporated. These are the potential to modify grazing systems to meet seasonal GRSG habitat requirements and management to improve the conditions of riparian areas and wet meadows.

Together these actions would reduce the potential for negative grazing-related impacts on SAS described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative B would provide an added benefit to sagebrush habitat. Therefore, Alternative B's direct and indirect effects of livestock grazing on

SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Energy Development

Direct and Indirect Effects

Under this Alternative, PHMA would be closed to new fluid mineral leasing, nonenergy leasable mineral leasing, and mineral material sales, and it would be proposed for withdrawal from mineral entry. In addition, mandatory BMPs would be applied as conditions of approval on fluid mineral leases. Existing leases entirely in PHMA would require applying 4-mile NSO buffers around leks. This would limit disturbances in sections to the 3 percent threshold and would apply numerous conservation measures to reduce impacts from mineral exploration and development in PHMA.

Alternative B does not include specific management for fluid, salable, locatable, and nonenergy leasable minerals in GHMA. As a result, current trends would continue, and impacts would be similar to those under Alternative A. Although Alternative B does not directly address wind energy development or industrial solar development, its 3 percent threshold for anthropogenic disturbances—e.g., highways, roads, geothermal wells, wind turbines, and associated facilities (see Infrastructure)—would apply to energy development and would limit the extent of all types of energy development in PHMA. These measures would reduce the impacts of energy development on SAS, as described under Alternative A.

Cumulative Effects

Management actions associated with energy development under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting SAS rather than removing or fragmenting habitat. Under Alternative B, in MZ IV, some of the energy development management would continue; however, it would include additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing them for withdrawal. Therefore, Alternative B's direct and indirect effects on SAS in MZ IV from energy development would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Recreation

Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to existing designated roads; therefore, Alternative B's conservation measures would not apply for limiting motorized travel to designated roads, primitive roads, and trails and for travel management would. Under Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA. There would be limited opportunities for road construction in PHMA, with minimum standards applied and no upgrading of current roads. Although general impacts would be the same as under Alternative A, Alternative B is more restrictive. It would likely reduce loss and fragmentation of SAS habitat and disturbance to SAS in PHMA by

minimizing human use and road construction or upgrades and reducing automotive collisions with SAS species. However, if these measures were to concentrate recreation and additional roads outside PHMA rather than just reducing it, the extent of impacts on SAS outside PHMA could increase under Alternative B.

Cumulative Effects

Management actions associated with recreation management under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting SAS rather than removing or fragmenting habitat. Under Alternative B, in MZ IV, some of the current recreation management direction would continue; however, it would include additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative B's direct and indirect effects of recreation management on SAS in MZ IV would largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Determination

Under Alternative B, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative B of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket mouse, pygmy rabbit, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area.

Alternative C

Infrastructure

Direct and Indirect Effects

Alternative C would have the most protective measures for GRSG. It would extend many of the Alternative B conservation measures to all occupied habitat, which would be managed as exclusion areas for new ROW projects. As a result, management under Alternative C would encourage consolidation of GRSG habitats, facilitating habitat conservation and management. Alternative C would also reduce the impacts of infrastructure on SAS in a wider area than Alternative B. Unlike Alternative B, which would permit wind energy siting in PHMA, provided a development disturbance threshold of 3 percent were not exceeded, Alternative C would not permit wind energy development siting in all occupied GRSG habitat. This would reduce the effects of wind energy on SAS discussed under Alternative A more so than Alternative B.

Like alternative B, Alternative C would remove, bury, or modify power lines but it would apply to all occupied GRSG habitat. This could disturb more SAS and habitat in the short term but perhaps would have a greater likelihood of reducing the potential for collisions with aerial species in the long term. This alternative would have the fewest negative impacts and most positive impacts on wildlife species whose ranges overlap with all occupied GRSG habitat.

Cumulative Effects

Management actions associated with infrastructure management under Alternative C would increase protection of sagebrush habitat, thereby benefiting SAS rather than removing or fragmenting habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current land and realty operations would continue; however, it would include additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative C's direct and indirect effects of infrastructure management to SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Fire and Fuels

Direct and Indirect Effects

Alternative C is similar to Alternative B, except that it is more protective of SAS and SAS habitat. This is because prioritization of suppression would apply to GHMA in addition to PHMA (i.e., all occupied habitat). It includes measures to manage vegetation for good or better ecological condition, and it focuses fuel breaks on areas of human habitation or significant disturbance. The negative impacts of fire suppression on conifer encroachment and fire suppression and fuels treatments on SAS (see Alternative A) would be offset by the prioritization of restoration treatments described below for invasive plants. The general effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

The cumulative effects of managing fire and fuels under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects under Alternative B. They would not be substantial, to change the population trend, or remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Alternative C would maintain the direction described under Alternative A, along with additional provisions that would limit invasive weed spread in all occupied GRSG habitat. Vegetation management would benefit weed control by prioritizing restoration, including reducing invasive plants, in all occupied GRSG habitat in order to benefit GRSG habitats. In all cases, local native plant ecotype seeds and seedlings would be used. These policies would reduce impacts from invasive plants on SAS and SAS habitat described under Alternative A. They would have similar impacts associated with treatment but would include additional conservation measures specific to limiting the spread of invasive plants. In addition, grazing would be eliminated in all occupied GRSG habitat, thereby also eliminating the potential for invasive plant spread by livestock in SAS habitat overlapping GRSG-occupied habitat. This would make Alternative C more protective of SAS and SAS habitat than Alternatives A or B.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plant treatments would continue. The short-term negative impacts of these activities on SAS and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative C would provide an added benefit to SAS. Therefore, Alternative C's direct and indirect effects of invasive plants management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Conifer Encroachment

Direct and Indirect Effects

As with Alternatives A and B, Alternative C does not directly address conifer encroachment; however, the weed control policies described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would also likely reduce juniper encroachment and the general effects of it on SAS and SAS habitat, as described under Alternative A.

Cumulative Effects

Under Alternative C, in MZ IV, vegetation management conservation measures would be instituted for invasive plant and fuel treatments that could reduce juniper encroachment. This is opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative C's direct and indirect effects of conifer encroachment management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Livestock Grazing

Direct and Indirect Effects

More than any of the alternatives, Alternative C would eliminate grazing on all occupied GRSG habitat. This would reduce the potential for both negative and positive grazing-related impacts on SAS and SAS habitat discussed under Alternative A. No new water developments or range improvements would be constructed in occupied habitat, and only habitat treatments that benefit GRSG would be allowed; most habitat treatments would be expected to benefit SAS as well. Grazing retirement would be allowed and fast tracked. Once grazing is eliminated, Alternative C could negatively impact SAS species by eliminating the artificial water developments that these species have come to rely on.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), livestock grazing would be eliminated in all occupied GRSG habitat, providing a net benefit to SAS. Therefore, direct and indirect effects of livestock grazing on SAS in MZ IV under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase impacts on SAS or sagebrush habitat.

Energy Development

Direct and Indirect Effects

Alternative C would expand Alternative B's protections to all occupied GRSG habitat and would prohibit new exploration permits for unleased fluid minerals. However, unlike Alternative B, wind energy development would not be allowed in occupied GRSG habitat. Like Alternative B, the conservation measures would reduce the general impacts of energy development on SAS, as described under Alternatives A and B, but to a larger degree than any of the other alternatives. Alternative C would protect larger areas of SAS habitat from degradation and fragmentation and would prevent or reduce disturbance to or displacement of SAS species in larger areas.

Cumulative Effects

Management actions under Alternative C for energy development would increase protection of all occupied habitat, thereby benefiting SAS, rather than removing or fragmenting habitat. Under Alternative C, in MZ IV, some of the current energy development management direction would continue, but there would be additional emphasis on protecting sagebrush habitat by adding all occupied habitat to existing closures and proposing it for withdrawal. Therefore, Alternative C's direct and indirect effects of energy development on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat (refer to the Cumulative Effects section of the FEIS).

Recreation

Direct and Indirect Effects

Alternative C is similar to Alternative B but applies to all occupied GRSG habitat as opposed to PHMA. Therefore, it would protect a larger area of SAS habitat from general recreation impacts on SAS of Alternatives A and B.

Cumulative Effects

Recreation management under Alternative C would increase protection of all occupied GRSG habitat, thereby benefiting SAS, rather than removing or fragmenting habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current recreation management direction would continue; however, it would include additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative C's direct and indirect effects of recreation management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Determination

Under Alternative C, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative C of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or

cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket mouse, pygmy rabbit, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area.

Alternative D

Infrastructure

Direct and Indirect Effects

Under Alternative D, PHMA, IHMA, and GHMA would be designated ROW avoidance areas. This is opposed to ROW exclusion areas for PHMA under Alternative B or all occupied habitat under Alternative C. New authorizations would be collocated, when possible, in or next to existing disturbance/footprints to avoid disturbing GRSG or its habitat. In PHMA, new authorizations for the following would not be allowed: transmission facilities greater than 50 kV, wind and solar and commercial geothermal development, nuclear, gas, or oil developments, airports, ancillary facilities associated with any of the aforementioned development, paved or gravel roads, and landfills. In IHMA, wind and solar development would be restricted where adverse effects could not be mitigated; GHMA would be avoidance areas for wind and solar reauthorization.

New ROWs and SUAs allowed in PHMA and IMHA would not result in a net loss of GRSG habitat. New authorizations or facilities would be sited outside of the 1.86-mile lek avoidance buffer areas, unless NEPA analysis suggested a greater or lesser required distance. New power and communications lines in PHMA, IHMA, and GHMA outside of existing ROWS would be required to be buried; existing lines would be evaluated for burying, modification, or relocation to at least 1.86 miles from occupied leks or winter habitat. These conservation measures would reduce the impacts on SAS and SAS habitat from infrastructure, relative to Alternative A, and may additionally reduce impacts over Alternative B; however, Under Alternative D, they would not be as protective of SAS and SAS habitat as the measures proposed in Alternative C.

Cumulative Effects

Management actions associated with infrastructure under Alternative D would increase protection of sagebrush habitat, thereby benefiting SAS, rather than removing or fragmenting habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current infrastructure management would continue but would include additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative D's direct and indirect effects of infrastructure management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Fire and Fuels

Direct and Indirect Effects

Alternative D would prioritize fire suppression in PHMA and IHMA, which together equal PHMA. Unlike Alternative B, it would also include the following conservation measures in PMHA, IMHA, and GHMA to strategically reduce fire effects:

- Planning and training firefighters in sagebrush management
- Designing and implementing fuels treatments, with an emphasis on maintaining, protecting, and expanding GRSG habitats
- Considering conifer encroachments as areas to manage wildfire for resource benefit

Overall, Alternative D would limit damage to sagebrush habitats from wildfire. Although Alternative D is similar to Alternatives B and C in prioritizing fire suppression, it would prioritize it in more GRSG habitat than Alternative B (only PHMA) and less than Alternative C (all occupied habitat). The general effects of fire suppression and fuels treatments would be similar to those described for Alternative A. Delineating conifer encroachment in PHMA as areas to manage wildfire for resource benefit could reduce the extent of suppression-related juniper encroachment discussed in Alternative B. This would protect habitat for SAS and reduce fuel loadings, which can contribute to larger-scale wildfires; these events have a particularly negative effect on pygmy rabbit and Columbia sharp-tailed grouse habitat and confound control efforts due to extreme fire behavior.

Cumulative Effects

The cumulative effect of fire and fuels management under Alternative D, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects under Alternative B. They would not be substantial, to change the existing population trend, or to remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the FEIS).

<u>Invasive Plants</u> (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Under Alternative D, the direction described under Alternative A would be maintained making it the same in terms of impacts from invasive plants and associated treatments. Similar to Alternative B, vegetation management conservation measures would benefit weed control in the long term by prioritizing restoration efforts. This includes reducing invasive plants and monitoring and controlling invasive species after construction, fuels treatments, and during new range improvements. Unlike Alternative B, monitoring and controlling invasive species after fuels treatments and during new range improvements would apply to PHMA, IHMA, and GHMA, rather than only PHMA. These policies would reduce the impacts of invasive plants under Alternative A on SAS habitat.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants treatments, would continue; and the short-term negative impacts of these activities on SAS and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to SAS. Therefore, Alternative D’s direct and

indirect effects of invasive plants management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Conifer Encroachment

Direct and Indirect Effects

Alternative D would prioritize vegetation rehabilitation projects designed to achieve the greatest improvement in GRSG abundance and distribution. These projects are those that address conifer encroachment in PHMA, IHMA, and GHMA. Factors contributing to higher emphasis would include the likelihood of conifer encroachment into GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in PMHA, IMHA, and GHMA. They also would reduce the impacts of conifer encroachment on SAS and SAS habitat, as described under Alternative A. Impacts from Alternative D's would be the same as those for vegetation treatments under Invasive Plants and Fire and Fuels under Alternative A. Alternative D would address conifer encroachment more so than Alternatives A, B, or C and therefore is more protective of SAS and SAS habitat.

Cumulative Effects

Under Alternative D, in MZ I, conifer encroachment projects that could reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative D's direct and indirect effects of conifer encroachment management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Livestock Grazing

Direct and Indirect Effects

Alternative D would include the same conservation measures as Alternative B but would expand many of those measures to PMHA, IMHA, and GHMA. It would also manage for vegetation composition (including riparian and lentic areas) and structure, consistent with appropriate GRSG seasonal habitat objectives relative to site potential. Both Alternatives D and F apply the same conservation measures as Alternative B, but Alternative B largely applies only to PHMA; Alternative D applies to PHMA, IHMA, and GHMA, and Alternative F applies to all occupied habitat. Together, these actions would reduce the potential for negative grazing-related impacts on SAS and SAS habitat described under Alternative A, more so than Alternatives B or E but less than Alternative C. It would be similar to Alternative F.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to SAS. Therefore, Alternative D's direct and indirect effects of livestock grazing on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably

foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Energy Development

Direct and Indirect Effects

Alternative D would close most PHMA to future fluid mineral leasing and nonenergy minerals leasing and development. It would place additional stipulations and seasonal restrictions on existing and future fluid mineral leases in certain IHMA, as follows:

- Leasing would be allowed, subject to standard seasonal and daily stipulations in breeding and winter habitat
- Well density would not be allowed to exceed 1/640 acre
- NSO of 1.86 miles would be allowed around leks
- IHMA would be closed to nonenergy minerals leasing

In GHMA, NSO would be allowed for nonenergy minerals leasing, or 1.86 miles of PHMA or IHMA, or for future fluid mineral leasing within 1.86 miles of occupied leks. Otherwise, GHMA would be available for fluid or nonenergy minerals leasing, subject to applicable seasonal and daily timing restrictions. Geophysical exploration would be allowed in PMHA, IMHA, and GHMA, subject to seasonal timing restrictions and other restrictions. These actions would reduce the impacts of mineral development on SAS discussed under Alternative A to a level similar to that of Alternative B.

Unlike Alternative B, Alternative D directly addresses solar and wind energy development, which would not be allowed in PHMA. In IHMA, wind and solar energy development would be restricted where adverse effects could not be mitigated. Ancillary facilities, such as roads and power lines, could be authorized, provided mitigation were to prevent any net loss of GRSG habitat. GHMA would be considered avoidance for wind and solar development. These actions could reduce negative impacts associated with energy development on SAS that occur in IHMA, relative to Alternatives A and B.

Cumulative Effects

Under Alternative D, in MZ IV, some of the current management direction for energy development would continue but would include additional emphasis on protecting sagebrush. Therefore, Alternative D's direct and indirect effects of energy development on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats (refer to the Cumulative Effects section of the FEIS).

Recreation

Direct and Indirect Effects

Alternative D would apply the following conservation measures to reduce the potential negative impacts of recreation on GRSG in PMHA, IMHA, and GHMA:

- Special Recreation Permits would be analyzed on a case-by-case basis and use would be directed away from sensitive seasons and areas
- Certain developed recreation sites and associated facilities would be designed or designated to direct use away from sensitive areas
- Seasonal restrictions for authorized activities would be incorporated

Alternative D would likely be more protective of SAS and SAS habitat than Alternatives A, B, or C because it includes additional measures.

Cumulative Effects

Alternative D would increase protection of sagebrush habitat, thereby benefiting SAS, rather than removing or fragmenting habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current recreation management direction would continue but would include additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative D's direct and indirect effects of recreation management on SAS in MZ would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Determination

Under Alternative D, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative D of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket mouse, pygmy rabbit, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area.

Alternative E1

<u>Infrastructure</u>

Direct and Indirect Effects

Alternative E1 is similar to Alternative B but not as restrictive. Core and IHMA would generally be identified as new ROW avoidance areas. In core habitat, new infrastructure ROWs or SUAs would be collocated with existing infrastructure. In IHMA, new infrastructure could be built if habitat protection criteria were met. General impacts on GRSG and their habitat under Alternative E1 would be the same as those for Alternative A. Because Alternative E1 includes fewer limitations on infrastructure in GRSG habitat than Alternative B, the potential for some infrastructure-related impacts on SAS may be higher. However, unlike Alternative B, Alternative E1 does not promote the undergrounding of utilities, so it would not reduce the potential for collisions with GRSG or flying SAS.

While Alternative E1 would reduce the likelihood of impacts from infrastructure, compared to existing management under Alternative A, it would not be as protective as Alternative D—it

would designate PMHA, IMHA, and GHMA as new ROW avoidance areas—or Alternatives C or F, which would generally manage all occupied habitat as new ROW exclusion areas.

Cumulative Effects

Management actions for infrastructure under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting SAS, rather than removing or fragmenting habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW avoidance areas in sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of infrastructure management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Fire and Fuels

Direct and Indirect Effects

Alternative E1 would reduce wildfire in sagebrush areas, prioritize fire suppression, and maintain fuel breaks in core habitat and IHMA. Fuels treatments would protect sagebrush ecosystems, and response times to fires in core habitat and IHMA would be reduced to limit damage. This alternative is unique in that adaptive management would be used to account for acres of habitat lost to fire in core habitat and IHMA. Although these measures would reduce the threat of wildfire to sagebrush and damage to SAS habitat, suppression-related juniper encroachment discussed in Alternative A could increase in some areas under Alternative E1. This would eliminate habitat for SAS, eventually resulting in heavy fuel loadings. This can contribute to larger-scale wildfires, with particularly negative effects on pygmy rabbit and Columbia sharp-tailed grouse habitat, and can confound control efforts due to extreme fire behavior. However, this would be offset to a certain degree by restoration and vegetation management measures that prioritize the removal of conifers in core habitat and IHMA.

The general effects of fire suppression and fuels treatments under Alternative E1 would be similar to those of Alternative A. Alternative E1 would be the most protective in terms of SAS and SAS habitat due to the combination of suppression prioritization and adaptive management measures; however, it would have similar short-term negative impacts on SAS and SAS habitats as Alternatives B, C and D from fuel break construction and maintenance.

Cumulative Effects

Management under Alternative E1 for fire and fuels management would increase protection of sagebrush habitat, thereby benefiting SAS, rather than removing or fragmenting habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the FEIS), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of fire on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Alternative E1 would maintain the policies described under Alternative A and would include additional measures to protect core, important, and GHMA, which would be managed to prevent invasion. Eradicating and controlling invasives threatening GRSG habitat would be pursued in core habitat and IHMA; invasives would be monitored for three years following a fire in these habitat areas. The policies under Alternative E1 would significantly reduce the impacts on SAS from invasive plants described in Alternative A and would be the most protective in terms of controlling invasive plants in SAS habitat; however, the short-term impacts on SAS habitat associated with invasive plant treatments (see Alternative A) would be the same and could affect a larger area.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plant treatments would continue and the short-term negative impacts on SAS and their habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to SAS. Therefore, alternative E1's direct and indirect effects of invasive plants management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Conifer Encroachment

Direct and Indirect Effects

Alternative E1 would prioritize conifer removal in core habitat and IHMA using methods that would minimize disturbance to GRSG and therefore SAS to the extent possible. Conifer encroachment projects would focus on areas with highest restoration potential, as evidenced by low canopy cover, existing sagebrush understory, and adjacent GRSG populations. Conifer encroachment projects would not be conducted in juniper stands older than 100 years. In addition, as described under Invasive Plants, core, important, and GHMA would be managed to prevent invasion.

Unlike Alternative D, Alternative E1 contains a specific restoration measure addressing conifer encroachment. However, Alternative D addresses conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. Treatments associated with these measures could negatively impact SAS and their habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A); however, they would benefit SAS and their habitat in the long term by reducing the impacts from conifer encroachment (see *Conifer Encroachment* under Alternative A). Negative impacts would be negligible making it a priority to use removal methods that minimize disturbance.

Cumulative Effects

Under Alternative E1, in MZ IV, conifer encroachment projects would be instituted as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E1's direct and indirect effects of conifer encroachment management on SAS in MZ IV would

be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or their habitat.

Livestock Grazing

Direct and Indirect Effects

Alternative E1 takes a very different approach to livestock grazing than the other alternatives. Management would add GRSG guidelines to grazing management plans in core habitat and IHMA. Rangeland health and permit renewal assessments would be conducted in core habitat and IHMA; allotments in core habitat that have declining GRSG populations would be prioritized, followed by allotments in IHMA that contain breeding habitat and decreasing lek counts. If assessments determined that livestock grazing were limiting the achievement of desired habitat characteristics, grazing permits would be adjusted during the renewal process to include measures to achieve desired conditions. These measures would reduce the potential for negative impacts from livestock grazing on SAS and their habitat (see *Livestock Grazing* under Alternative A).

Relative to Alternative B, Alternative E1 focuses less management on riparian areas, meadows, and other wetlands; thus, SAS species that use those types of habitats would experience fewer beneficial effects under Alternative E1 than under Alternative B.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of livestock grazing on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Energy Development

Direct and Indirect Effects

Alternative E1 would follow much of the current guidance on leasing and developing mineral resources (Alternative A); however, it would add measures to minimize impacts on GRSG that would also minimize impacts on SAS, as follows:

- In core habitat and IHMA, exploration for oil and gas development that used temporary roads would be permissible if site disturbance were minimized
- In core habitat and IHMA, surface occupancy associated with oil and gas development would not be allowed unless the surface development would not accelerate or cause declines in GRSG populations
- Surface disturbance from roads for fluid mineral development in core habitat would be limited to 3 percent and in important habitat to 5 percent of suitable habitat per an average of 640 acres

- Wind energy development projects would comply with all infrastructure development BMPs and the 2012 USFWS Wind Energy Guidelines
- Impacts on SAS from energy development would essentially continue, as described under Alternative A, although their magnitude and spatial distribution would differ. The effects of wind energy on SAS, as described in Infrastructure and Energy Development under Alternative A, would be reduced as the result on compliance with USFWS Wind Energy Guidelines

Cumulative Effects

Management actions for energy development under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting SAS, rather than removing or fragmenting their habitat. Under Alternative E1, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of energy development on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Recreation

Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to designated roads, so Alternative E1 conservation measures directed toward limiting motorized travel to designated roads, primitive roads, and trails, so travel management would not be applicable. Under Alternative E1, timing and seasonal restrictions would be applied to activities known to disturb nesting GRSG. This approach would reduce the impacts of recreation on SAS described under Alternative A, particularly for SAS species using sagebrush habitats during the breeding season. However, compared to current management under Alternative A, Alternative E1 would less protective of SAS than the other action alternatives.

Cumulative Effects

Management actions associated with recreation management under Alternative E1 include timing and seasonal restrictions for the GRSG breeding season, thereby benefiting SAS. Under Alternative E1, in MZ IV, some of the current recreation management direction would continue but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative E1's direct and indirect effects of recreation management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitat.

Determination

Under Alternative E1, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative E1 of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket

mouse, pygmy rabbit, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area.

Alternative E2

Infrastructure

Direct and Indirect Effects

For all ROWs and SUAs in PHMA, management stipulations and conditions would focus on mitigating direct GRSG disturbance during construction. PHMS would be designated as an avoidance area for new ROWs and SUAs, which is less protective of GRSG habitat than Alternatives B, C, or F but similar to Alternatives D and E1.

Similar to Alternatives B, C, and F, Alternative E2 would include a disturbance cap. However, it would apply a 5 percent disturbance cap as opposed to a 3 percent disturbance cap, and the areas the caps would apply to and the types of disturbances that contribute toward the caps would differ. Similar to Alternative D, Alternative E2 directly addresses siting wind energy facilities, but it would be less restrictive than Alternative D by avoiding rather than excluding wind energy developments in PHMA and by applying BMPs and industry, state, and federal stipulations in cases where siting in PHMA could not be avoided.

Similar to Alternative E1, Alternative E2 would not promote the undergrounding of utilities. Electrical transmission lines, and where feasible and consistent with federally required electrical separation standards, new linear transmission features would be sited in existing corridors, or at a minimum, in concert with existing linear features in GRSG habitat. Therefore, Alternative E2 would not be as likely to prevent collisions with aerial species as Alternatives B, C, D, or F; therefore, it would not be as protective of SAS.

GRSG habitat outside PHMA would not be managed to conserve the species, and no specific management actions are provided for this habitat. Therefore, current trends for SAS species would likely continue outside of PHMA.

Cumulative Effects

Management actions associated with infrastructure under Alternative E2 would increase protection of sagebrush habitat, thereby benefiting SAS rather than removing or fragmenting habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the FEIS), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW avoidance areas in sagebrush habitat. Therefore, Alternative E2's direct and indirect effects of infrastructure management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Fire and Fuels

Direct and Indirect Effects

Alternative E2 would implement the following unique strategies to address response to fire and reduce the general effects of fire on GRSG as discussed under Alternative A:

- Create and implement a statewide fire agency agreement that would eliminate jurisdictional boundaries and allow for immediate response to natural fire in PHMA
- Allow the use of fire-retardant vegetation that would buffer areas of high quality GRSG habitat from catastrophic fire
- Use prescriptive fire with caution in sagebrush habitat and only at higher elevations and in a manner designed to benefit GRSG
- Conduct effective research into controlling fire size and protecting remaining GRSG areas that are next to high-risk cheatgrass areas
- Focus research efforts on effective reclamation and restoration of landscapes altered by wildfire
- Manage winter habitat to maintain maximum amount of sagebrush, especially tall sagebrush (80 percent), which would be available to GRSG above snow during a severe winter
- Coordinate the needs and efforts for GRSG with the State of Utah committee formed to protect the health and welfare by reducing the size and frequency of catastrophic fires

Similar to Alternative B, Alternative E2 would consider the use of prescriptive grazing to specifically reduce fire size and intensity on all types of landownership, where appropriate. Overall, the protective benefits of Alternative E2 on SAS and SAS habitat would likely be most similar to that of Alternative B, but it would have similar short-term negative impacts on SAS and sagebrush habitats as those under Alternative A for suppression and prescribed fire.

Cumulative Effects

Alternative E2's fire and fuels management would increase sagebrush habitat protection, thereby benefiting SAS rather than removing or fragmenting their habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the FEIS), current wildfire suppression would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E2's direct and indirect effects of fire on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Invasive Plants

Direct and Indirect Effects

Alternative E2 directs land managers to aggressively respond to new infestations to keep invasive species from spreading. Every effort would be made to identify and treat new infestations before they become larger problems. Additionally, containment of known infestations in or near sagebrush habitats would be a high priority for all land management. Vegetation management tools described above for Fire and Fuels and below for Livestock Grazing would help to reduce the general impacts of invasive plants on GRSG, as described under Alternative A. Alternative E2, like Alternative E1, would be more protective in controlling invasive plants in sagebrush habitat than any of the other alternatives; however, the short-term

impacts on SAS and their habitat associated with invasive plant treatments would be the same as under Alternative A and could affect a larger area.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the FEIS), current invasive plants treatments would continue. The short-term negative impacts of these activities on SAS and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to SAS. Therefore, Alternative E2's direct and indirect effects of invasive plants management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Conifer Encroachment

Direct and Indirect Effects

Alternative E2 includes a habitat restoration and vegetation management conservation measure specific to conifer encroachment. It would aggressively remove encroaching conifers and other plant species to expand GRSG habitat where possible. Alternative E2's treatments could negatively impact SAS and sagebrush habitat in the short term (refer to vegetation treatments discussion for *Invasive Plants* in Alternative A); however, they would benefit SAS and sagebrush habitat in the long term by reducing the negative impacts of conifer encroachment described under Alternative A. In comparison, Alternative D would address conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. This would provide a greater benefit to SAS and sagebrush habitat. Alternative E2 is most similar to Alternative E1, except it does not include a stipulation for prioritizing the removal methods to minimize disturbance.

Cumulative Effects

Under Alternative E2, in MZ IV, conifer encroachment projects would be instituted as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E2's direct and indirect effects of conifer encroachment management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future action, it would not substantially increase impacts on SAS or sagebrush habitats.

Livestock Grazing

Direct and Indirect Effects

Alternative E2 would continue to make GRSG PHMA and GHMA available for livestock grazing. Should site-specific concerns be raised about the effect of grazing on GRSG habitat and such effects are documented over a sufficient time frame, corrective management actions would be addressed by BMPs. Incompatible grazing strategies would be addressed through established rangeland management practices consistent with maintaining or enhancing habitat. GRSG habitat for leks, nesting and early brood rearing, late brood rearing, and winter would be considered when managing sagebrush rangelands.

Water developments would be designed to enhance mesic habitat for GRSG to maintain adequate vegetation in wet meadows. Within PHMA, GRSG stipulations would take precedence over stipulations for other species if conflicts occur and if otherwise allowable by law. Livestock fences would be located away from leks, and the NRCS fence standards to reduce bird strikes would be used, benefiting sharp-tailed grouse as well. New infestations of invasive exotic plants would be responded to aggressively to prevent spreading. Overall, measures associated with livestock grazing under Alternative E2 would benefit SAS and their habitat, except in cases where conflicting species stipulations occur. However, Alternative E2 would be less protective of SAS and sagebrush habitat than Alternatives B, C, D, or F.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis to protect sagebrush habitat under Alternative E2 would provide an added benefit to SAS. Therefore, Alternative E2's direct and indirect effects of livestock grazing on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Energy Development

Direct and Indirect Effects

Under Alternative E2, PHMA would be considered suitable for further coal leasing and underground mining. PHMA and GHMA that is not already withdrawn or proposed for withdrawal would be available for locatable mineral entry. PHMA would be open to mineral materials and oil and gas leasing and would be an avoidance area for wind energy development, although it would not be precluded.

All of the aforementioned forms of energy development, as well as nonenergy leasable mineral lands, solid mineral exploration, and geophysical exploration activities, would be subject to the following stipulations, as well as BMPs accepted by industry and state and federal agencies:

- New permanent disturbance, including structures, fences, and buildings, should not be located in the occupied lek itself
- Permanent disturbance should not be allowed within 1 mile of an occupied lek, unless it is not visible to the GRSG using the lek
- Disturbance outside the lek should not produce noise 10 db above the ambient level at the edge of the lek during breeding season
- Time-of-day (when the lek is active) and seasonal stipulations applying to specific habitats would be applied and based on site-specific conditions, in coordination with the local UDWR biologist
- Disturbance in PHMA would be avoided, if possible, or minimized by locating development in habitat of the least importance if avoidance in PHMA is not possible
- Project proponents would have to demonstrate why avoidance would not be possible, cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area, and migration barriers would be avoided

All existing fluid mineral uses are explicitly recognized by this alternative and would not be affected by it. The GRSG conservation measures identified in the associated NEPA documents for each of these projects would continue to be implemented to protect GRSG and its habitat. Provisions of this alternative would not be added to the measures identified for each specific project.

GRSG habitat outside PHMA would not be managed to conserve the species, and no specific management actions are provided for this habitat. Similar to Alternative E1, Alternative E2's impacts on SAS from energy development activities would essentially continue as described in Alternative A, although somewhat reduced by BMPs.

Cumulative Effects

Management of energy development under Alternative E2 would increase protection of GRSG and sagebrush habitat, thereby benefiting SAS rather than removing or fragmenting their habitat. Under Alternative E2, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E2's direct and indirect effects on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Recreation

Direct and Indirect Effects

Alternative E2 would limit or reduce impacts from recreation by preventing new permanent disturbance, including structures, fences, and buildings, in occupied leks or within 1 mile of an occupied lek, unless they were not visible to the GRSG using the lek. It would limit disturbance outside of leks to no more than 10 db above the ambient level at the edge of the lek during breeding season. Time-of-day (when the lek is active) and seasonal stipulations applying to specific habitats would be applied based on site-specific conditions and in coordination with the local UDWR biologist.

In PHMA (nesting and brood-rearing areas, winter habitat, other habitat), disturbance would be avoided, if possible, or minimized by locating development in habitat of the least importance if avoidance were not possible. Project proponents would have to demonstrate why avoidance would not be possible, cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area, and migration barriers would be avoided. Alternative E2 could be more protective of SAS and their habitat than any of the other alternatives because measures to reduce impacts would apply to all recreation as opposed to only SUAs or camping.

Cumulative Effects

Management actions for recreation under Alternative E2 would reduce disturbance to GRSG, thereby benefiting SAS. In MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative E2's direct and indirect effects of recreation management on SAS in MZ IV would be largely beneficial. When combined with the past,

present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Under Alternative E2, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative E2 of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket mouse, pygmy rabbit, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area.

Alternative F

Infrastructure

Direct and Indirect Effects

Land uses and realty management under Alternative F would essentially be the same as that under Alternative B; the effects on SAS and sagebrush habitat would be the same.

Cumulative Effects

The cumulative effects of infrastructure management on SAS and sagebrush habitat in MZ IV would be the same as Alternative B.

Fire and Fuels

Direct and Indirect Effects

Fire and fuels management under Alternative F would essentially be the same as that under Alternative B. The impacts on SAS and sagebrush habitat would be the same as Alternative B.

Cumulative Effects

The cumulative effects of fire and fuels management on SAS and sagebrush habitat in MZ IV would be the same as Alternative B.

Invasive Plants (Annual Grasses and Other Noxious Weeds)

Direct and Indirect Effects

Invasive plants management under Alternative F would essentially be the same as that under Alternative B. Together, these measures would reduce impacts from invasive plants on sagebrush habitat, as described under Alternative A, but the effects of the treatments would be the same.

Cumulative Effects

The cumulative effects of invasive plants management on SAS and sagebrush habitat in MZ IV would be the same as Alternative B.

Conifer Encroachment

Direct and Indirect Effects

As with Alternatives A and B, Alternative F does not directly address conifer encroachment and would maintain the invasive plant direction described under Alternative A. The types of impacts would be the same, but Alternative F's conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts on GRSG habitat from conifer encroachment. Because those measures generally would apply throughout occupied GRSG but would be limited to PHMA under Alternative B, Alternative F could provide an additional reduction in the magnitude of impacts on SAS habitat from conifer encroachment.

Cumulative Effects

The cumulative effects of conifer encroachment management on SAS and sagebrush habitat in MZ IV would be the same as Alternative B.

Livestock Grazing

Direct and Indirect Effects

Alternative F would include beneficial management actions similar to those of Alternative B, except they would apply in all GRSG habitats. These are as follows:

- Completing land health assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Considering retiring vacant allotments
- Improving management of riparian areas and wet meadows
- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Implementing BMPs for West Nile virus
- Removing, modifying, or marking fences

Together these actions would reduce the potential for negative impacts of grazing on SAS described under Alternative A.

Cumulative Effects

Under Alternative F, in MZ IV (refer to the Cumulative Effect section of the FEIS), livestock grazing would continue to be managed through existing grazing plans, but with additional emphasis on protecting sagebrush habitat. This would provide an added benefit to SAS. Therefore, Alternative F's direct and indirect effects of livestock grazing on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Energy Development

Direct and Indirect Effects

Under Alternative F wind energy development would be prevented in PHMA, which would be closed to new fluid mineral and nonenergy leasable mineral leasing and mineral material sales. It would be proposed for withdrawal from mineral entry, NSO would be stipulated for leased fluid minerals, and a 3 percent disturbance cap would be applied. Numerous conservation measures would be implemented to reduce impacts from mineral exploration and development in PHMA. As under Alternative B, Alternative F does not include specific management for locatable, salable, or nonenergy minerals in GHMA. Unlike Alternative B, Alternative F directly addresses wind energy and fluid minerals development outside of PHMA. Wind energy would be sited at least 5 miles from active GRSG leks and at least 4 miles from the perimeter of GRSG winter habitat. Areas within 4 miles of active GRSG leks would be closed to new fluid minerals leasing. Alternative F, although similar to Alternative B, would reduce the impacts of energy development on SAS and sagebrush habitat more so. This is because it addresses wind energy and fluid minerals leasing outside of PHMA more thoroughly.

Cumulative Effects

Management for energy development under Alternative F would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting SAS rather than removing or fragmenting their habitat. Under Alternative F, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative F's direct and indirect effects of livestock grazing on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS and sagebrush habitats.

Recreation

Direct and Indirect Effects

Alternative F would follow the same general approach as Alternative A; however, as under Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA. In addition, in all occupied habitat, camping areas within 4 miles of active leks would be closed seasonally. The general recreation effects of Alternative F would be the same as those for Alternatives A and B, although Alternative F would be somewhat more protective of SAS and their habitat than Alternative B, due to the seasonal closures.

Cumulative Effects

Management for recreation under Alternative F would increase protection of sagebrush habitat, thereby benefiting SAS rather than removing or fragmenting habitat. Under Alternative F, in MZ IV, some of the current recreation management would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, the direct and indirect effects of recreation management on SAS in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on SAS or sagebrush habitats.

Determination

Under Alternative F, proposed conservation measures would limit many, but not all impacts to GRSG and GRSG habitat. Therefore, Alternative F of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species for the bighorn sheep, Great Basin pocket mouse, pygmy rabbit, Columbia spotted bat, Townsend's big-eared bat, Columbian sharp-tailed grouse, western boreal toad, or western toad in the plan area.

Proposed Plan

Infrastructure

Direct and Indirect Effects

Although the types of infrastructure-related impacts on sensitive species under the Proposed Plan would be similar to those for Alternative A, the Proposed Plan includes actions that could change the extent of those impacts and their distribution across the landscape.

This analysis focuses on elements of the Proposed Plan that would be most relevant to impacts on sensitive terrestrial species. In PHMA and SFAs, the Proposed Plan would restrict new lands SUAs for infrastructure, such as high-voltage transmission lines, major pipelines, hydropower, distribution lines, and cellular towers. Exceptions must be limited and based on rationale (e.g., monitoring, modeling, or best available science) that explicitly demonstrates that adverse impacts on GRSG will be avoided by the exception. In PHMA and sagebrush focal management areas, new solar and wind utility-scale and commercial energy development would be prohibited, except for on-site power generation for existing industrial infrastructure. In IHMA, new wind energy utility-scale and commercial development would be restricted.

In all GRSG habitat management areas and SFAs, new infrastructure (e.g., high-voltage transmission lines, major pipelines, roads, distribution lines, and cellular towers) would be collocated with existing infrastructure or where it best limits impacts on GRSG and their habitats. This would be to limit disturbance to the smallest footprint. When new infrastructure cannot be collocated, it would be located next to existing infrastructure, roads or disturbed areas.

In PHMA and sagebrush focal management areas, outside of designated corridors, new transmission lines and pipelines would be buried to limit disturbance to the smallest footprint. The exception would be if explicit rationale were provided that the biological impacts on GRSG and its habitat would be avoided.

These conservation measures would reduce the level of negative impacts from infrastructure under Alternative A and may provide some additional reduction in impacts over Alternative B.

Some infrastructure-related elements of the Proposed Plan could increase negative impacts on sensitive species over Alternatives A and B. The Proposed Plan would require new power and communication lines in PHMA and SFAs outside ROWs to be buried where feasible. This could impact sensitive terrestrial species through direct mortality or habitat degradation. In comparison with Alternative D, which would require new power and communication lines to be buried in PHMA, IHMA, and GHMA outside existing ROWs, under the Proposed Plan a smaller area could be subject to undergrounding utilities. Because the power lines could be undergrounded in

a larger area than under Alternative B, which focuses only on PHMA, more sensitive plant species could be impacted. However, such impacts would be minimized or avoided because burying power lines would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied for sensitive species.

Cumulative Effects

Under the Proposed Plan, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall benefit to sensitive species that occur in in it. Therefore, the Proposed Plan's direct and indirect effects of lands and realty management on sensitive species in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive species.

Fire and Fuels

Direct and Indirect Effects

As with Alternatives B and D, the Proposed Plan would prioritize fire suppression in PHMA. Similar to Alternative D, the Proposed Plan would also include the following conservation measures to reduce fire effects:

- Planning and training in sagebrush management for fire suppression
- Designing and implementing fuels treatments with an emphasis on maintaining, protecting, and expanding GRSG habitats
- Considering conifer encroachment as areas to manage wildfire for resource benefit

In addition, the Proposed Plan would include SFA in these measures. The types of impacts on sensitive species associated with fire and fuels would be similar to those discussed under Alternative A, but their extent and distribution across the landscape would differ. Efforts to exclude fire from GRSG habitats would have impacts on sensitive species similar to those discussed under Alternative D; however, measures that expand sagebrush habitat conservation SFA could provide an additional benefit to sensitive species in those areas and require mature sagebrush habitat.

Cumulative Effects

Under the Proposed Plan, management actions associated with fire and fuels would increase protection of all GRSG habitats. Though such management could result in some negative impacts on sensitive species, their overall effects would be neutral or beneficial. The cumulative effect of fire and fuels management actions under the Proposed Plan, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects for Alternative B and D. They would not be substantial, to change the population trend, or to remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the FEIS).

Invasive Plants

Direct and Indirect Effects

Under the Proposed Plan, invasive nonnative plant control would follow current direction, and the types of direct and indirect impacts on sensitive species would be the same as those for Alternative A. Similar to Alternative B, vegetation management conservation measures under the Proposed Plan would prioritize restoration, including reducing invasive plants and monitoring and controlling invasive species after management projects. Applicable to all GRSG habitat management areas and SFAs, the Proposed Plan contains specific guidelines to incorporate appropriate invasive annual grass management during the design of GRSG habitat restoration projects and road and roadway maintenance.

Under the Proposed Plan, short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or herbicides, could negatively impact individual sensitive species. Such impacts would be minimal because project-level environmental review would be done and appropriate avoidance or minimization measures would be incorporated. The use of native seed would be favored in restoration under the Proposed Plan, as it would be under Alternatives B and D. Current Forest Service policy (FSM 2070.3) already restricts the use of nonnative seed in restoration and prohibits the use of invasive species.

Cumulative Effects

Under the Proposed Plan, current invasive species management would continue, and the long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive species. Additional measures to conserve sagebrush habitat and restore degraded sagebrush habitat under the Proposed Plan would provide a further net benefit to sensitive species in all GRSG habitat management areas and SFAs. Therefore, the Proposed Plan's direct and indirect effects of invasive species management on GRSG in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive species.

Conifer Encroachment

Direct and Indirect Effects

Similar to Alternative D, the Proposed Plan would address conifer encroachment more directly than Alternatives A, B, or C by emphasizing vegetation rehabilitation projects that reduce conifer encroachment into important GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in all GRSG habitat management areas, including SFAs.

The types of impacts on sensitive species from conifer encroachment and associated management actions under the Proposed Plan would be the same as those described under Alternative A. The Proposed Plan would likely reduce the magnitude of the negative impacts on sensitive species from conifer encroachment relative to Alternative A.

The negative impacts of encroachment removal projects would be minimized or avoided because such projects would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied.

Because Alternative D and the Proposed Plan would take a more direct approach at managing

conifer encroachment than Alternatives A, B, and C, the overall beneficial effects of these actions would be increased.

Cumulative Effects

Under the Proposed Plan, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate GRSG habitat conservation measures that directly address conifer encroachment. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on sensitive species. Therefore, the Proposed Plan's direct and indirect effects of conifer encroachment management on sensitive species in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive species.

Livestock Grazing

Direct and Indirect Effects

The Proposed Plan contains a standard that specifically prohibits construction of water developments in PHMA, IHMA, and SFA unless beneficial to GRSG habitat. Other measures for livestock grazing in the Proposed Plan are similar to Alternative D, including managing for vegetation composition (including riparian and lentic areas) and structure consistent with appropriate GRSG seasonal habitat objectives relative to site potential.

Both Alternative D and the Proposed Plan include consideration of grazing retirement in all GRSG habitats if grazing privileges were relinquished or an allotment became vacant; however, the Proposed Plan extends this measure to SFA.

The Proposed Plan also restricts camps, sheep bedding, livestock trailing, fence construction, and other new permanent livestock facilities on areas near active GRSG leks. Although the types of impacts on sensitive species would be the same as under Alternative A, the level and extent of negative impacts would likely be reduced under the Proposed Plan.

Sensitive species that occur in GRSG habitats would likely benefit from improving habitat conditions in uplands, riparian areas, meadows, and other wetlands, such as the boreal toad and western toad. The Proposed Plan would provide greater benefit to sensitive species than Alternatives A, B, and D; however, Alternative C removes the most livestock grazing from GRSG habitats.

Cumulative Effects

Under the Proposed Plan, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS). Additional measures to conserve sagebrush habitat under the Proposed Plan would further minimize negative impacts on sensitive species in GRSG habitat. Therefore, the direct and indirect effects of livestock grazing in MZ IV under the Proposed Plan, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive species.

Energy Development

Direct and Indirect Effects

The types of impacts on sensitive species from energy development under the Proposed Plan would be the same as described for Alternatives A and B, though their magnitude and spatial distribution would differ. As with Alternative D, the Proposed Plan would include provisions to conserve GRSG habitat. Similar to Alternative D, actions would include closing most PHMA and IHMA to future fluid mineral leasing and development. It also places additional stipulations and seasonal restrictions on existing fluid mineral leases in all GRSG habitats to minimize potential impacts. However, the Proposed Plan would additionally require NSO for any new oil and gas leases in PHMA, IHMA, and SFA. Most other minerals restrictions would also apply to SFA. For the Proposed Plan the 3 percent disturbance cap would be calculated in the biologically significant unit instead of in each section. These actions would likely reduce the impacts of fluid

mineral development on sensitive species relative to Alternative A to a level even less than Alternative D.

Unlike Alternative B, the Proposed Plan would directly address solar and wind energy development. Similar to Alternative D, in PHMA, the Proposed Plan would prohibit new wind and solar energy development. However, unlike Alternative D, the Proposed Plan would extend this prohibition and most other restrictions to SFA as well. Alternative D and the Proposed Plan would make IHMA avoidance areas and GHMA would remain open for wind and solar energy development in Idaho. However, only the Proposed Plan would make GHMA avoidance areas for wind and solar energy development in Montana. The Proposed plan would be likely to reduce the negative impacts of energy development on sensitive species that occur in GRSG habitats relative to Alternatives A, B, and D.

Cumulative Effects

Under the Proposed Plan, some of the current energy development would continue in MZ IV; however, additional measures would conserve sagebrush habitat and provide an overall long-term benefit to the sensitive species that occur there. Therefore, the Proposed Plan's direct and indirect effects on sensitive species in GRSG habitat in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive species.

Recreation

Direct and Indirect Effects

The Proposed Plan would apply measures to reduce the potential negative impacts of recreation on GRSG. Similar to Alternative D, in all GRSG habitats, terms and conditions in new and existing permits and operating plans should be included to protect or restore GRSG habitat; however, the Proposed Plan extends these measures to include SFA. In PHMA, IHMA, and SFA, the Proposed Plan also specifies not authorizing temporary recreation that result in loss of habitat or would have negative impacts for more than 5 years on GRSG or their habitats. It also would not approve new or expanded recreation facilities (e.g., roads, trails, campgrounds), including SUAs for facilities and activities, unless the development would result in a net conservation gain to GRSG or their habitats or the development were required for visitor safety.

The Proposed Plan measures would reduce the general impacts on GRSG of recreation described under Alternative A. Although the types of impacts on sensitive species would be similar to Alternatives A, B, and D, the extent of impacts in GRSG habitat would be lower under the Proposed Plan due to its greater extent of restrictions by delineating SFA.

Cumulative Effects

Management for recreation under the Proposed Plan would increase protection of PHMA, IHMA, GHMA, and SFA in MZ IV by minimizing the negative impacts of recreation on sensitive species. Therefore, when combined with the past, present, and reasonably foreseeable future actions, recreation management in MZ IV under the Proposed Plan would not substantially increase negative impacts on sensitive species.

Summary and Determination of Effects on Sensitive Terrestrial and Aquatic Species

The Proposed Plan would reduce impacts on GRSG habitat from activities in all major program areas of the current Forest Service LUPs in the analysis area. The restrictions and considerations for the benefit of GRSG habitat would also improve sensitive species habitat and would reduce the potential for negative impacts on sensitive species individuals. Some negative effects would continue, but the overall result would be benefit sensitive species and their habitats. Therefore, the GRSG LUPA for the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Challis, Salmon, and Sawtooth National Forest Plans and the Curlew National Grassland Plan **may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species** for the nine Region 1 and Region 4 sensitive terrestrial species in Table 2.

Because their potential habitats do not exist in GRSG habitat or are outside the elevation range of the GRSG, the GRSG LUPA for the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Challis, Salmon, and Sawtooth National Forest Plans and the Curlew National Grassland Plan would have **no impact on** the 26 Region 1 and Region 4 sensitive terrestrial or aquatic species excluded from detailed analysis in Table 1.

The Proposed Plan would not cause a trend toward federal listing or cause a loss of viability to any populations for any of the 35 sensitive terrestrial or aquatic species considered in this analysis. Because of this, the determinations above are consistent with sensitive species direction in each of the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Challis, Salmon, and Sawtooth National Forest Plans and the Curlew National Grassland Plan.

C. Sensitive Plants

Forest sensitive plants have been grouped for this analysis due to the similar types of impacts they could experience and the programmatic nature and landscape scale of this analysis. The landscape scale effects of the proposed conservation measures for each program area in each alternative are analyzed generally and collectively for this group of species. For each species, the NatureServe ranking is provided in the status section to provide additional context for the global and state rarity of the species. (For a thorough discussion of NatureServe rankings, please refer to the NatureServe web site [NatureServe 2015].)

Agastache cusickii (Cusick's horse-mint)

Status

Cusick's horse-mint is an R1 sensitive species that is considered to be vulnerable to apparently secure globally (G3G4) and to be imperiled to vulnerable in Montana (S2S3).

Distribution

Cusick's horse-mint is documented from Idaho, Montana, Nevada, and Oregon. Within Montana, the species is documented from Beaverhead County. On the Beaverhead-Deerlodge National Forest, Cusick's horse mint is documented from the Dillon Ranger District in the Tendoy Mountains.

Habitat Associations, Natural History, and Threats

Cusick's horse-mint is an herbaceous long-lived perennial in the mint family. It occurs in rolling sagebrush hills, primarily on steep, loose talus slopes with little vegetation cover below limestone outcrops and often in chutes. In its habitat, woody dominants are limber pine, Douglas-fir, mountain mahogany, big sagebrush, and gooseberry. In Montana, Cusick's horse-mint is documented from elevations of 6,500 to 9,500 feet. On the Beaverhead National Forest, it is confined to the south-facing slopes of narrow canyons across a wide range of elevations. One lower-elevation occurrence occupies the slope above a broad valley. Threats to Cusick's horse-mint are overgrazing, gravel removal, slope-destabilizing road maintenance, rock gardener and recreationist over-collection, and mining.

Agoseris lackschewitzii (Pink agoseris)

Status

Pink agoseris is an R4 sensitive species that is considered apparently secure globally (G4) but imperiled in Idaho (S2).

Distribution

Pink agoseris occurs in Idaho, Montana, Washington, Wyoming, Alberta, and British Columbia. In Idaho, pink agoseris has been found in Fremont and Lemhi Counties. In Lemhi County, pink agoseris is documented from the Lemhi Range in the Mill Creek Basin. Mapped locations occur on the Salmon-Challis National Forest in the Lemhi Range on the Salmon-Cobalt and Leodore Ranger Districts.

Habitat Associations, Natural History, and Threats

A member of the sunflower family, pink agoseris is a perennial forb that typically flowers in July and August. Pink agoseris occurs in wet meadows in which the soil is saturated through the growing season and in ecotones between wet meadows and forest. When present, dominant overstory species are subalpine fir, Engelmann spruce, whitebark pine, and Douglas-fir. In Montana, pink agoseris is documented from elevations of 6,950 to 9,450 feet. Cattle grazing has been identified as a threat to this species.

Allium acuminatum (Tapertip onion)

Status

Tapertip onion is an R1 sensitive species that is considered globally secure (G5) but imperiled to vulnerable in Montana (S2S3).

Distribution

Tapertip onion is documented from Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming, and British Columbia. It could occur in all ranger districts in the Beaverhead-Deerlodge National Forest.

Habitat Associations, History, and Threats

Tapertip onion is a perennial bulb that typically flowers in May and June. The species occurs in dry open forests and grasslands in the montane zone at elevations of 2,600 to 8,000 feet in Montana. No specific threats have been identified for tapertip onion at this time, though invasive weeds may pose a potential long-term threat at some sites.

***Allium parvum* (Small onion)**

Status

Small onion is an R1 sensitive species that is considered globally secure (G5) but vulnerable in Montana (S3).

Distribution

Small onion is documented from California, Idaho, Montana, Nevada, Oregon, and Utah. Most Montana occurrences are documented from the Bitterroot National Forest. Within the Beaverhead-Deerlodge National Forest, small onion could occur in the Dillon Ranger District.

Habitat Associations, Natural History, and Threats

Small onion is a perennial bulb that typically flowers in late May and June. The species occurs in dry, open forests, woodlands, and grasslands on warm slopes in the montane zone at elevations of 4,000 to 6,500 feet in Montana. Many of the documented occurrences in Montana consist of large numbers of individuals that cover extensive areas. Spotted knapweed and cheatgrass occur fairly commonly in habitat occupied by small onion and pose a threat to populations of this species.

***Allium tolmiei* var. *persimile* (Tolmie's onion)**

Status

Tolmie's onion is listed as sensitive in R4 and is considered globally vulnerable (T3) and vulnerable in Idaho (S3).

Distribution

Tolmie's onion is endemic to Idaho, where it is documented from Adams and Washington Counties.

Habitat Associations and Natural History

Tolmie's onion is a perennial bulb that occurs in mixed semiarid shrub and grasslands, mainly on south aspects in swales, ephemeral watercourses, and seeps with basaltic soils that are seasonally wet but dry by mid to late summer. Tolmie's onion is documented from elevations of 3,000 to 5,000 feet

***Astragalus anserinus* (Goose Creek milkvetch)**

Status

Goose Creek milkvetch is an R4 sensitive species that is considered globally imperiled (G2) and critically imperiled in Idaho (S1).

Distribution

Goose Creek milkvetch is endemic to the Goose Creek basin in Nevada, Idaho, and Utah. In Idaho, the species is documented from Cassia County.

Habitat Associations, Natural History, and Threats

A member of the pea family, Goose Creek milkvetch is a short-lived perennial herb that flowers in June and July. The species occurs in sagebrush, rabbitbrush, and juniper on barren slopes composed of white tuffaceous sand at elevations of 5,000 to 5,200 feet. Threats are nonnative invasive species (particularly cheatgrass and leafy spurge), cattle overgrazing, road construction and maintenance, mineral exploration and development, and insect pollinators.

***Astragalus aquilonius* (Lemhi milkvetch)**

Status

Lemhi milkvetch is an R4 sensitive species that is considered vulnerable globally (G3) and in Idaho (S3).

Distribution

Lemhi milvetch is endemic to Lemhi, Custer, and Butte Counties in east-central Idaho. The species is documented from the main Salmon and East Fork Salmon River canyons, the Lemhi River valley, the southwestern edge of the Lemhi Range, and the Pahsimeroi and Lost River valleys. Two occurrences are documented on the Sawtooth National Recreation Area. In the Salmon-Challis National Forest, occurrences are documented from the Challis-Yankee Fork Ranger District and the Lost River Ranger District.

Habitat Associations, Natural History, and Threats

Lemhi milkvetch is a perennial herb in the pea family. The species occurs at lower elevations in the sagebrush-steppe zones on shale, gravel banks, clay washes of gullied clay bluffs, steep eroded canyon banks, and sand bars. Associated vegetation is dominated by Wyoming big sagebrush, bluebunch wheatgrass, shadscale, bottlebrush squirreltail, Sandberg's bluegrass, and sometimes Challis milkvetch. Threats to Lemhi milkvetch are nonnative species, trampling from recreationists, maintenance or construction of trails and roads, ORVs, mining, herbicide applications to treat invasive species, and overgrazing by domestic livestock.

***Astragalus diversifolius* var. *diversifolius* (meadow milkvetch)**

Status

Meadow milkvetch is on the R4 sensitive list and is considered imperiled globally (G2) and in Idaho (S2).

Distribution

Meadow milkvetch is endemic to central Idaho and northern Utah, with one historic report from the Green River Basin in western Wyoming. In Idaho, meadow milkvetch is distributed primarily in Custer and Lemhi Counties, in the valleys of the Big Lost, Little Lost, Pahsimeroi, and Lemhi Rivers and in Birch Creek. On the Salmon-Challis National Forest, meadow milkvetch is documented from the Lost River Ranger District.

Habitat Associations, Natural History, and Threats

Meadow milkvetch is a perennial herb in the pea family. It occurs in sagebrush valleys or closed drainage basins in moist, often alkaline meadows and swales at elevations of 4,400 to 6,620 feet. Threats to meadow milkvetch are livestock grazing and loss of habitat to agriculture.

***Astragalus jejunus* var. *jejunus* (Starveling milkvetch)**

Status

Starveling milkvetch is on the R4 sensitive list and is considered vulnerable globally (T3) and imperiled in Idaho (S3).

Distribution

Starveling milkvetch is documented from Colorado, Idaho, Nevada, Utah, and Wyoming.

Habitat Associations, Natural History, and Threats

Starveling milkvetch is a perennial herb that occurs in sagebrush and pinyon-juniper on dry, barren ridges, summits, bluffs, hilltops, and river terraces on tuff, shale, sandstone, cobble or clays at elevations of 5,700 to 7,310 feet. Starvelig milkvetch occurs most commonly on south to west aspects with slopes less than 20 degrees and is less abundant when soil texture is very fine or when shale size is greater than 2 inches.

***Astragalus scaphoides* (Bitterroot milkvetch)**

Status

Bitterroot milkvetch is an R1 sensitive species that is considered vulnerable globally (G3) and in Montana (S3).

Distribution

The distribution of Bitterroot milkvetch is limited to Lemhi County, Idaho, and Beaverhead Counties, Montana. In the Beaverhead-Deerlodge National Forest, Bitterroot milkvetch is documented from the Dillon Ranger District.

Habitat Associations, Natural History, and Threats

A member of the pea family, Bitterroot milkvetch is a stout perennial herb that typically flowers in late May and early June. The species occurs in grassland, generally with a dense cover of sagebrush, on silty soils with a moderate to high content of coarse material. Bitterroot milkvetch often is found along drainages in the ecotone between rocky, steep

upper slopes and nearly level benches. The species is most frequent on south and southwest aspects. In Montana, Bitterroot milkvetch is documented from approximately 5,000 to 7,000 feet. Threats to Bitterroot milkvetch ae road construction, herbivory by insects and mammals, and overgrazing by livestock.

***Balsamorhiza macrophylla* (large-leaved balsamroot)**

Status

Large-leaved balsamroot is an R1 sensitive species that is considered vulnerable to secure globally (G3G5) and vulnerable to apparently secure in Montana (S3S4).

Distribution

Large-leaved balsamroot is documented from Idaho, Montana, Utah, and Wyoming. On the Beaverhead-Deerlodge National Forest, the species is known from the Madison Ranger District in the Centennials, Gallitin, and Madison Ranges.

Habitat Associations and Natural History

Large-leaved balsamroot is a perennial herb that flowers from late June to early July. The species occurs in sagebrush and grasslands in the montane zone, most often on open, east-facing slopes of 8 to 15 percent, with loamy soils in a sagebrush-forb community. Large-leaved balsamroot is known from elevations of 7,400 to 7,920 feet.

***Boechera fecunda* (Sapphire rockcress)**

Status

Sapphire rockcress is an R1 sensitive species that is considered imperiled globally (G2) and in Montana (S2).

Distribution

Sapphire rockcress is endemic to Montana. On the Beaverhead-Deerlodge National Forest, the species is documented from the Dillon, Wise River, Jefferson, and Butte Ranger Districts.

Habitat Associations, Natural History, and Threats

Sapphire rockcress is a perennial forb in the mustard family. The species occurs on moderate to steep slopes that exhibit natural erosion, warm aspects, and sparse vegetation. In Beaverhead and Silver Bow Counties, Sapphire rockcress grows in mountain mahogany-juniper, limber pine woodland, very open Douglas-fir forest, sagebrush, and sparse bluebunch wheatgrass grasslands on soils derived exclusively from sand calcareous sediments. The elevation range of Sapphire rockcress is 4,200 to 7,960 feet. Threats to Sapphire rockcress are nonnative plants (particularly spotted knapweed), overgrazing, herbicide use, mining, and pathogens.

***Botrychium crenulatum* (dainty moonwort)**

Status

Dainty moonwort is an R1 and R4 sensitive species that is considered globally vulnerable (G3), vulnerable in Montana (S3), and critically imperiled in Idaho (S1),

Distribution

Dainty moonwort is widely distributed throughout the western United States and Canada but is locally rare across its range. Dainty moonwort is documented from Arizona, California, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming, British Columbia, and Alberta. On the Beaverhead-Deerlodge National Forest, dainty moonwort is documented from the Pintler Ranger District.

Habitat Associations, Natural History, and Threats

Dainty moonwort is a small (2 to 6.5 inches) perennial fern that occurs in diverse habitats, including stream bottoms, seeps, and marsh edges, wet swales, alpine meadows, and grassy roadsides, often on soils of reprecipitated calcium. Dainty moonwort is the most hydrophyllic of the moonworts and typically grows in saturated soils. In Montana and Idaho, fronds of dainty moonwort emerge in the spring, reach maturity in June or July, and die in the fall. As with other moonworts, dainty moonwort exists underground in the gametophyte stage for much of its life cycle and may not emerge every year, making surveys unreliable. In Montana, dainty moonwort is documented at elevations of approximately 2,500 to 7,500 feet. Montana populations are generally small and occupy roadsides or other similarly open or disturbed habitats, which makes them particularly vulnerable to weed invasion, weed treatment, and road maintenance. Because populations of dainty moonwort are small and highly disjunct, they are particularly vulnerable to stochastic natural phenomena.

***Botrychium hesperium* (western moonwort)**

Status

Western moonwort is an R1 sensitive species that is considered apparently secure globally (G4) and vulnerable in Montana (S3).

Distribution

Western moonwort is widely distributed throughout the western United States and Canada but is locally rare across its range. In the United States, the species is documented from Alaska, Arizona, Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming; in Canada it is documented from British Columbia, Alberta, and Yukon Territory. In the Beaverhead-Deerlodge National Forest, western moonwort occurs on the Pintler and Wise River Ranger Districts.

Habitat Associations, Natural History, and Threats

Western moonwort is a small (2 to 8 inches) perennial fern that occurs in diverse habitats across its range, from open canopied forests in the south of its range to open meadows in the north. In Montana, the species occurs in valley and montane zones along roadsides and in dry to moist gravely and lightly disturbed grasslands, meadows, and mid-succession gravel bars. In Montana, fronds of western moonwort typically emerge in late spring, mature by June or

July, and die in early fall. As with other *Botrychium* species, western moonwort exists underground in the gametophyte stage for much of its life cycle and may not emerge every year, making surveys unreliable. The elevation range of western moonwort in Montana is 2,000 to 9,500 feet, with most occurrences between 3,000 and 5,000 feet. Montana populations are poorly documented or small and occur along roadsides, which makes them particularly vulnerable to nonnative species invasions, weed treatments, and road maintenance. Because populations of western moonwort are small and highly disjunct, they are particularly vulnerable to stochastic natural phenomena.

Botrychium lineare (slender moonwort)

Status

Slender moonwort is an R4 sensitive species that is considered globally imperiled (G2) and possibly extirpated in Idaho (SH).

Distribution

Slender moonwort is widely distributed throughout the western United States and Canada but is locally rare across its range. In the United States, the species is documented from Alaska, California, Colorado, South Dakota, Montana, Utah, Washington, and Wyoming; in Canada it is documented from Yukon Territory and historically from New Brunswick and Quebec. In Idaho, slender moonwort is documented from one possibly extirpated occurrence in the Upper Priest Lake area.

Habitat Associations, Natural History, and Threats

Slender moonwort is a 2- to 7-inch perennial fern that occupies highly varied habitats across its range, including moist to dry meadows, bogs, swamps, roadside ditches, dry fields, and forests, in a variety of areas, ranging from limestone cliffs and gravelly beaches to forest understory. Slender moonwort is among the least frequently encountered moonworts. As with other *Botrychium* species, slender moonwort exists underground in the gametophyte stage for much of its life cycle and may not emerge every year, making surveys unreliable. Most occurrences are montane at 4,900 to 9,800 feet, but the species occupies elevation from sea level to 10,000 feet. Threats to slender moonwort are road maintenance, nonnative invasive species, and overgrazing by livestock. Because populations of slender moonwort are small and highly disjunct, they also are vulnerable to stochastic natural phenomena.

Botrychium paradoxum (peculiar moonwort)

Status

Peculiar moonwort is an R1 and R4 sensitive species that is considered vulnerable to apparently secure globally (G3G4), vulnerable in Montana (S3), and critically imperiled in Idaho (S1).

Distribution

Peculiar moonwort occurs over a large area in the western United States and Canada but is locally rare across its range. In the United States, peculiar moonwort is documented from

California, Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming; the species also occurs in Canada. In the Beaverhead-Deerlodge National Forest, peculiar moonwort is documented from the Jefferson and Pintler Ranger Districts.

Habitat Associations, Natural History, and Threats

Peculiar moonwort is a 3- to 6-inch perennial fern with a single spore-bearing frond. Peculiar moonwort occurs in montane and subalpine zones, in mesic meadows in sagebrush and spruce lodgepole pine forests. In Montana, associated species are rough fescue, Virginia strawberry, and potentilla. In Montana, fronds emerge in the spring, typically mature by July, and die in the fall. As with other moonworts, peculiar moonwort exists underground in the gametophyte stage for much of its life cycle and may not emerge every year, making surveys unreliable. Occurrences in Montana are documented from 2,500 to 9,500 feet. Threats to peculiar moonwort are livestock grazing, weed invasion, and recreationists. Because populations of peculiar moonwort are small and highly disjunct, they also are vulnerable to stochastic natural phenomena.

Botrychium simplex (little grape fern)

Status

Little grape fern is an R4 sensitive species that is considered globally secure (G5) but imperiled in Idaho (S2).

Distribution

Little grape fern is one of the most widely distributed moonworts. The species occurs across much of the United States (including Idaho and Montana) and Canada, though its abundance is low in many states and provinces in its range. Little grape fern is documented from northern, central, and southern Idaho. In the Sawtooth National Forest, little grape fern is documented from two occurrences.

Habitat Associations, Natural History, and Threats

Little grape fern is a 1- to 5-inche perennial fern that occurs in diverse habitats across its range, including pastures, meadows, orchards, prairies, wetlands, fens, roadsides, and sand dunes, most of which are temporarily wet to permanently saturated, in full sun to low light understory conditions. Fronds emerge in the spring, mature in summer, and die in the fall. As with other moonworts, little grape fern exists underground in the gametophyte stage for much of its life cycle and may not emerge every year, making surveys unreliable. Idaho occurrences are documented from 4,000 to 6,000 feet. Threats to little grape fern are trampling from recreationists, ORVs, construction and maintenance of trails and roads, timber sales, fuels projects, competition from nonnative species, and domestic livestock grazing.

Bryum calobryoides (beautiful bryum)

Status

Beautiful bryum is an R4 sensitive species that is considered globally vulnerable (G3) and possibly extirpated in Idaho (SH).

Distribution

Beautiful bryum is documented from California, Colorado, Idaho, Montana, Oregon, Washington, Alberta, British Columbia, and Quebec. One known population exists in the Sawtooth National Forest, and one historic population is documented from the Boise National Forest.

Habitat Associations, Natural History, and Threats

Beautiful bryum is a small bright green moss that typically forms short dense tufts and occasionally occurs as individual stems. Beautiful bryum occurs in the montane to subalpine zones in bogs, meadows, and damp cliff sides, on substrates that range from basic to acidic rock to moist soils. Beautiful bryum occurs at elevations of 5,000 feet and above. As with other mosses, beautiful bryum may be under-documented due to difficulties with surveys and identification. Threats to this species are alteration of hydrology (for example, water developments, dewatering, and soil compaction), maintenance or construction of trails and roads, ORVs, nonnative species, and domestic livestock grazing.

***Carex idahoa* (Idaho sedge)**

Status

Idaho sedge is an R1 sensitive species that is considered imperiled to vulnerable globally and vulnerable in Montana (S2).

Distribution

Idaho sedge is documented from California, Idaho, Montana, Oregon, and Utah. In the Beaverhead-Deerlodge National Forest, Idaho sedge is documented from the Dillon, Wisdom, Jefferson, and Butte Ranger Districts and could occur in all other ranger districts.

Habitat Associations, Natural History, and Threats

Idaho sedge is a rhizomatous perennial graminoid, whose fruits mature in July and August. The species occurs in moist alkaline meadows, often in subirrigated soils associated with low-gradient streams or springs and seeps. The species commonly occupies ecotones between wet meadow and sagebrush steppe and often occurs on terraces of headwater streams above 6,000 feet. Small populations may occur at lower elevations or along larger streams. Idaho sedge generally occurs on silty soils with high organic content and little or no coarse material. In Montana, Idaho sedge is documented from elevations of 4,500 to 8,420 feet. Potential threats are overgrazing, mowing, road construction, and mineral extraction.

***Eleocharis rostellata* (beaked spikerush)**

Status

Beaked spikerush is an R1 sensitive species that is considered globally secure (G5) but vulnerable in Montana (S3).

Distribution

Beaked spikerush occurs in 39 of the United States (including Idaho and Montana), three Canadian provinces, northern Mexico, the Antilles, and the Andes. In Montana, beaked spikerush is documented from over a dozen extant sites and several historic locations. In the Beaverhead-Deerlodge National Forest, beaked spikerush is documented from the Madison Ranger District.

Habitat Associations, Natural History, and Threats

Beaked spikerush is a perennial graminoid. In Montana, the species flowers in July, and fruits mature in July and August. Montana populations occur in wet, often alkaline soils associated with warm springs or fens in the valley and foothills zones at elevations of 2,700 to 6,100 feet. Threats to beaked spikerush are hydrologic alteration and development.

***Epipactis gigantea* (giant helleborine)**

Status

Giant helleborine is an R1 sensitive species that is considered apparently secure globally (G4) but imperiled to vulnerable in Montana (S2S3).

Distribution

Giant helleborine is documented from Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, Wyoming, and British Columbia. In Montana, giant helleborine is documented from Carbon, Flathead, Granite, Lake, Madison, Powell, Sanders, and Teton Counties. In the Beaverhead-Deerlodge National Forest, the species is known from the Madison and Pintler Ranger Districts.

Habitat Associations, Natural History, and Threats

Giant helleborine is a 12- to 39-inch-tall, long-lived perennial orchid with leafy stems that arise from short rhizomes. In Montana, plants typically flower between late June and early August. Montana populations of giant helleborine occur on stream banks, along lake margins, and in fens with springs and seeps, often near thermal waters. The species is limited to habitats that receive a constant supply of water. Documented elevations of giant helleborine in Montana range from approximately 2,500 to 6,000 feet. Primary threats are hydrologic alteration and development. Elsewhere in its range, negative impacts have been documented from recreational use of hot springs, overgrazing by livestock, and nonnative species invasion.

***Eriogonum brevicaule* var. *desertorum* (desert buckwheat)**

Status

Desert buckwheat is on the R4 sensitive list and is considered globally vulnerable (G3), vulnerable in Nevada (S3), and critically imperiled in Utah (S1).

Distribution

Desert buckwheat is narrowly distributed and is known only from central and eastern Elko County, Nevada, and northwestern Box Elder County, Utah.

Habitat Associations, History

Desert buckwheat is a low, matted herbaceous perennial herb that typically flowers between May and August. It occurs in mixed grassland, saltbush, and sagebrush communities and in pinyon-juniper woodlands on gravelly or silty to clayey flats, slopes, and ridges, often on limestone soils. Desert buckwheat is documented from elevations of approximately 4,900 to 9,700 feet.

***Eriogonum capistratum* var. *welshii* (Welsh buckwheat)**

Status

Welsh buckwheat is on the R4 sensitive list and is considered imperiled globally (T2) and in Idaho (S2).

Distribution

Welsh buckwheat is endemic to east-central Idaho. Occurrences are known from the valleys and foothills of the upper Big Lost, Little Lost, and Pahsimeroi Rivers in Custer and adjacent potions of Lemhi and Butte Counties. On the Salmon-Challis National Forest, Welsh buckwheat is documented from the Lost River Ranger District.

Habitat Associations, Natural History, and Threats

Welsh buckwheat is a mat-forming perennial forb that flowers in late June. Welsh buckwheat occurs on rocky volcanic slopes and gravelly clay or sedimentary barren flats, with minimal vegetation consisting of scattered fringed sagebrush, Sandberg's bluegrass, bluebunch wheatgrass, ricegrass, and cushion-like forbs. These areas occur in a larger matrix of well-developed stands of big or low sagebrush steppe vegetation, which occupies areas of deeper silt loam soils. Welsh buckwheat is documented from elevations of 6,000 to 8,000 feet. Threats to Welsh buckwheat are cattle grazing, OHVs, and mining.

***Gentianopsis simplex* (hiker's gentian)**

Status

Hiker's gentian is an R1 sensitive species that is considered globally secure (G5) but imperiled in Montana (S2).

Distribution

Hiker's gentian is documented from California, Idaho, Montana, Nevada, Oregon, and Wyoming. In Montana, the species is documented from Beaverhead, Carbon, and Missoula Counties. In the Beaverhead-Deerlodge National Forest, hiker's gentian is known from the Wisdom Ranger District and could occur in the Wise River and Dillon Ranger Districts.

Habitat Associations, Natural History

Hiker's gentian is an annual forb that flowers in July and August. The species occupies fens, meadows, and seeps in the montane and subalpine zones and typically grows in areas of crystalline parent material. In Montana, hiker's gentian is documented from elevations of 4,460 to 8,400 feet. The species is thought to be under-documented in Montana.

Juncus hallii (Hall's rush)

Status

Hall's rush is an R1 sensitive species that is apparently secure to secure globally (G4G5) and apparently secure in Montana.

Distribution

Hall's rush is documented from Colorado, Idaho, Montana, Utah, and Wyoming. In Montana, the species occurs in Beaverhead, Broadwater, Jefferson, Madison, Meagher, Powell, and Silver Bow Counties. In the Beaverhead-Deerlodge National Forest, Hall's rush is documented from the Wisdom, Butte, and Madison Ranger Districts and could occur in the Wise River Ranger District.

Habitat Associations, History

Hall's rush is a perennial graminoid that typically flowers in July and August. The species occurs in moist to dry meadows and slopes from valley to montane zones at 4,000 to 8,860 feet in Montana.

Mimulus primuloides (primrose monkeyflower)

Status

Primrose monkeyflower is an R1 sensitive species that is considered apparently secure globally (G4) but imperiled in Montana (S2).

Distribution

Primrose monkeyflower is documented from Arizona, California, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Washington. In Montana, the species is documented from Beaverhead and Ravalli Counties. In the Beaverhead-Deerlodge National Forest, primrose monkeyflower occurs in the Wise River, Wisdom, and Dillon Ranger Districts.

Habitat Associations, Natural History, and Threats

A member of the lopseed family, primrose monkeyflower is a small perennial mat-forming herb that flowers from July to early September. Primrose monkeyflower occurs in fens, sphagnum bogs, and wet meadows in montane and subalpine zone. In Montana, primrose monkeyflower occurs at elevations of 6,750 to 8,440 feet. Potential threats to primrose monkeyflower are fire, changes in hydrology, and ski area development.

***Noccaea idahoensis* var. *aileeniae* (=*Thlaspi aileeniae*; Idaho pennycress)**

Status

Idaho pennycress is on the R4 sensitive list and is considered vulnerable globally (T3) and in Idaho (S3).

Distribution

Idaho pennycress is endemic to the intermountain valleys of central Idaho. Occurrences are documented from upper Marsh Creek, Stanley Basin, Sawtooth Valley, and upper Big Wood River drainage. Eight of 18 known occurrences are in the Sawtooth National Forest.

Habitat Associations, Natural History, and Threats

A member of the mustard family, Idaho pennycress is a perennial herb that occurs in sagebrush-fescue flats with little sagebrush and mountain big sagebrush, on loose bare sandy soil, on steep slopes among small rocks in the openings between sagebrush plants, and on alluvial terraces. Populations are documented from elevations of 6,000 to 11,000 feet. Threats to Idaho pennycress are fire, cheatgrass invasion, mining, recreation, maintenance and construction of trails and roads, ORVs, competition from nonnative species, herbicide application, and domestic livestock grazing.

***Oxytropis besseyi* var. *salmonensis* (Challis crazyweed)**

Status

Challis crazyweed is on the R4 sensitive list and is considered vulnerable globally (T3) and in Idaho (S3).

Distribution

Challis crazyweed is endemic to Custer County, Idaho, where it occurs in the Big Lost, Pahsimeroi, and Upper Salmon watersheds. In the Salmon-Challis National Forest, occurrences are documented from Challis-Yankee Fork and Lost River Ranger Districts. Mapped locations occur on the Lost River Range and on adjacent BLM-administered lands.

Habitat Associations, Natural History

A member of the pea family, Challis crazyweed is a long-lived perennial forb that flowers from June to July. Challis crazyweed occurs in sagebrush and salt desert shrub in sandy washes or open slopes of rocky volcanic soil at elevations of 5,400 to 6,750 feet.

***Penstemon idahoensis* (Idaho penstemon)**

Status

Idaho penstemon is an R4 sensitive species that is considered imperiled globally (G2) and in Idaho (S2).

Distribution

Idaho penstemon is documented from Idaho, Nevada, and Utah.

Habitat Associations, Natural History

A member of the plantain family, Idaho penstemon is a perennial forb that is 3 to 8 inches tall. Most occurrences consist of low numbers of individuals covering small areas. Idaho penstemon occurs most commonly in Utah juniper communities, on gentle to steep slopes, usually of south to southwest aspects. In these areas, Idaho penstemon is restricted to tuffaceous outcrops of the Salt Lake Formation. Soils on which the species occurs tend to be dry, fine textured, and hard. The documented elevation range of Idaho penstemon is 4,900 to 5,710 feet

***Penstemon lemhiensis* (Lemhi penstemon)**

Status

Lemhi penstemon is an R1 and R4 sensitive species that is considered vulnerable globally (G3) and in Montana and Idaho (S3).

Distribution

Lemhi penstemon is a regional endemic of Lemhi County, Idaho, and Beaverhead, Deer Lodge, Ravalli, and Silverbow Counties, Montana. In the Beaverhead-Deerlodge National Forest, Lemhi penstemon is documented from the Wise River, Jefferson, Butte, Dillon, and Wisdom Ranger Districts. The species also is documented from over 100 occurrences in the Salmon-Challis National Forest.

Habitat Associations, Natural History, and Threats

A member of the plantain family, Lemhi penstemon is a tall, conspicuous perennial forb that typically flowers from early June to late July. Most occurrences contain fewer than 30 individuals. Lemhi penstemon occurs in big sagebrush-grassland communities and open Douglas-fir, lodgepole pine, and ponderosa pine forests on moderate to steep, east- to southwest-facing slopes. In these areas, Lemhi penstemon usually is found in association with big sagebrush and bunchgrasses in openings, such as rock outcrops and steep rocky slopes with natural soil slippage. Some populations grow partially or entirely on road banks. Lemhi penstemon is documented from an elevation range of 4,150 to 8,200 feet. Threats to this species are road construction, road maintenance, mining, botanical collection, herbicide spraying, weed invasion, livestock grazing, fire suppression, logging, and prolonged drought.

***Phacelia minutissima* (least phacelia)**

Status

Least phacelia is an R4 sensitive species that is considered globally vulnerable (G3) but imperiled in Idaho (S2).

Distribution

Least phacelia is a regional endemic that is documented from Nevada, Idaho, Oregon, and Washington. In Idaho, multiple occurrences of least phacelia are known from the Owyhee Mountains. Two occurrences have been documented north of the Snake River. One is on a ridge extending east-southeast, from Smoky Dome in the Soldier Mountains in the Fairfield Ranger District of the Sawtooth National Forest, and the other is near Hash Spring on the BLM Shoshone Field Office. Both are considered historic occurrences as recent surveys have failed to detect any individuals at either site.

Habitat Associations, Natural History, and Threats

A member of the waterleaf family, least phacelia is an annual forb that occurs in sagebrush and lower montane forests in ephemerally moist drainages. Individuals of this species grow singly or close together in dense mats. Least phacelia often occurs near areas of late snow banks in meadows, springs, and seeps and along stream banks. Idaho populations occur mostly in stands of false hellebore and adjacent forbs and grasses or near mixed aspen, willow, and subalpine fir communities. The elevation range of least phacelia is approximately 5,000 to 8,200 feet. Threats to least phacelia are mining, recreation, construction and maintenance of trails and roads, ORVs, water development, and competition from nonnative species, herbicide application, and domestic livestock grazing.

***Physaria carinata* ssp. *carinata* (keeled bladderpod)**

Status

Keeled bladderpod is on the R1 sensitive list and is considered vulnerable globally (T3) and critically imperiled in Montana (S1).

Distribution

Keeled bladderpod is endemic to carbonate mountain ranges of Idaho, Montana, and Wyoming. In Montana, occurrences are documented from Beaverhead and Granite Counties. On the Beaverhead-Deerlodge National Forest, keeled bladderpod occurs on the Wise River and Pintler Ranger Districts.

Habitat Associations, Natural History, and Threats

A member of the mustard family, keeled bladderpod is a biennial to short-lived perennial forb that typically flowers in early June. Keeled bladderpod occurs on gravelly, calcareous slopes in the foothill zone in grassland and sagebrush and near the upper tree line. In Montana, occurrences are documented from an elevation range of approximately 4,000 to 7,500 feet. Nonnative invasive species, particularly spotted knapweed, have been documented as a threat to some occurrences of keeled bladderpod.

***Physaria carinata* ssp. *pulchella* (beautiful bladderpod)**

Status

Beautiful bladderpod is on the R1 sensitive list and is considered imperiled globally (T2) and in Montana (S2).

Distribution

Beautiful bladderpod is endemic to Beaverhead County, Montana, where it occurs in the Pioneer Mountains, the Grasshopper Creek drainage, and the Centennial Mountains. In the Beaverhead-Deerlodge National Forest, beautiful bladderpod is documented from the Wise River, Madison, and Dillon Ranger Districts.

Habitat Associations, Natural History, and Threats

A member of the mustard family, beautiful bladderpod is a perennial forb that typically flowers in June at lower elevations and July through August at higher elevations. Beautiful bladderpod occurs on gravelly calcareous soils of sparsely vegetated foothill slopes in mountain mahogany or limber pine woodlands, on poorly developed stony soils of subalpine slopes and ridges, in sparse grassland or cushion plant communities, and in sagebrush communities. Though usually associated with calcareous parent material, beautiful bladderpod also occurs on limestone and quartzite. In Montana, beautiful bladderpod is documented from an elevation range of 6,300 to 9,600 feet. Potential threats to beautiful bladderpod are nonnative invasive species and mining.

Physaria didymocarpa var. *lyrata* (Salmon twin bladderpod)

Status

Salmon twin bladderpod is on the R4 sensitive list and is critically imperiled globally (T1) and in Idaho (S1).

Distribution

Salmon twin bladderpod is endemic to Lemhi County, Idaho. In the Salmon-Challis National Forest, Salmon twin bladderpod is documented from the Salmon-Cobalt and Leadore Ranger Districts. Until the 1980s, Salmon twin bladderpod was known only from one location on BLM-administered land at Williams Creek in the Salmon River Mountains. Occurrences currently are documented from Pattee Creek, Willliams Creek, Agency Creek, Basin Creek, and Bear Basin Creek and from the Lake Mountain area. The Bear Basin Creek and Lake Mountain area occurrences are in the Salmon-Challis National Forest.

Habitat Associations, Natural History, and Threats

Salmon twin bladderpod is a long-lived perennial forb in the mustard family. Occurrences are found in basin big sagebrush-bluebunch wheatgrass vegetation on rocky, sparsely vegetated south slopes at elevations of 4,050 to 5,000 feet. Threats identified for salmon twin bladderpod are mining (including gravel removal), nonnative invasive species proliferation, herbicide spraying, ORVs, and soil erosion.

Polygonum douglasii spp. *austiniae* (Austin's knotweed)

Status

Austin's knotweed is on the R1 sensitive list and is considered apparently secure globally (T4) and imperiled to vulnerable in Montana (S2S3).

Distribution

A member of the buckwheat family, Austin's knotweed is documented from California, Idaho, Montana, Nevada, Oregon, Washington, Wyoming, Alberta, and British Columbia. In Montana, occurrences are sparsely distributed from the Rocky Mountain Front to the Madison and Gallatin Ranges. On the Beaverhead-Deerlodge National Forest, Austin's knotweed is documented from the Jefferson, Madison, and Pintler Ranger Districts. The probability of finding additional occurrences of Austin's knotweed in Montana is thought to be high because extensive areas of suitable habitat across western and central Montana remain unsurveyed.

Habitat Associations, Natural History, and Threats

Austin's knotweed is an annual forb that typically flowers in July and fruits in August. The subspecies occurs on gravelly, often shale-derived soil on open slopes and banks and along roads in the montane zone. In Montana, Austin's knotweed is documented from an elevation range of 4,320 to 8,520 feet. Occurrences of Austin's knotweed along roads may be particularly susceptible to road maintenance and invasion by nonnative species.

Primula alcalina (alkali primrose)

Status

Alkali primrose is an R1 and R4 sensitive species that is considered imperiled globally (G2) and in Montana and Idaho (S2).

Distribution

Alkali primrose is a regional endemic from east-central Idaho and adjacent Montana. In Montana, the species is known only from Beaverhead County, where it occurs on BLM- and National Forest-administered land. In the Beaverhead-Deerlodge National Forest, the species occurs in the Dillon Ranger District. In Idaho, alkali primrose is documented from Lemhi County.

Habitat Associations, Natural History, and Threats

Alkali primrose is a perennial forb that typically flowers in May and early June and fruits from June to August. Alkali primrose occurs in moist to wet alkaline meadows on low, relatively level benches next to creeks and spring heads whose subirrigated soils are saturated to the surface throughout the growing season. Occupied areas often display hummock-hollow topography. Alkali primrose is associated with alluvial, alkaline, fine-textured, light-colored soils derived from the outwash of predominantly carbonate rocks. The documented elevation range of alkali primrose is approximately 6,300 to 7,200 feet. Threats to alkali primrose are cattle grazing and hydrology alteration.

Primula incana (mealy primrose)

Status

Mealy primrose is an R1 sensitive species that is considered apparently secure to secure globally (G4G5) but imperiled in Montana (S2).

Distribution

Mealy primrose is broadly distributed in the United States and Canada. Occurrences are documented from Alaska, Colorado, Idaho, Montana, North Dakota, Utah, Wyoming, Alberta, British Columbia, Manitoba, Northwest Territories, Ontario, Saskatchewan, and Yukon Territory. In the Beaverhead-Deerlodge National Forest, the species occurs in the Dillon and Madison Ranger Districts.

Habitat Associations, Natural History, and Threats

Mealy primrose is a perennial forb that typically flowers in May and June in Montana. The species occurs in wet meadow habitats with relatively stable water tables in which soils remain moist to saturated throughout the growing season but are seldom to never inundated. Mealy primrose also occurs in bogs and along stream banks. Associated soils are usually calcareous. The elevation range of mealy primrose in Montana is 6,500 to 8,694 feet. Threats to mealy primrose are cattle grazing and hydrology alteration.

Pyrrocoma (=*Haplopappus*) *insecticruris* (bugleg goldenweed)

Status

Bugleg goldenweed is an R4 sensitive species that is considered vulnerable globally (G3) and in Idaho (S3).

Distribution

Bugleg goldenweed is endemic to south-central Idaho, where it occurs in Camas and Blaine Counties. Several occurrences of bugleg goldenweed are documented from the Sawtooth National Forest.

Habitat Associations, Natural History, and Threats

Bugleg goldenweed is a perennial forb in the sunflower family. The species typically flowers in July and August. Bugleg goldenweed occurs in grassland and sagebrush communities on dry ground in vernally wet grasslands, meadows, and swales, and along the dry edges of seeps at elevations of 4,500 to 7,500 feet. Though bugleg goldenweed occurs at many undisturbed sites, past or ongoing disturbance is evident at numerous occupied sites, including road shoulders, road ROWs, fence lines, pastures, corrals, and abandoned fields. Species associated with bugleg goldenweed are western yarrow (*Achillea millefolium*), asters (*Aster* spp.), early low (alkali) sagebrush (*Artemisia arbuscula longiloba*), low sagebrush (*A. longifolia*), mountain big sagebrush (*A. tridentata vaseyana*), rabbitbrush (*Chrysothamnus* spp.), oatgrass (*Danthonia* spp.), bottlebrush squirreltail (*Elymus elymoides*), Idaho fescue (*Festuca idahoensis*), Great Basin wildrye (*Leymus cinerus*), lupines (*Lupinus* spp.), tarweed

(*Madia* spp.), bluebunch wheatgrass (Pseudoroegneria spicata), bluegrass (*Poa secunda*), cinquefoil (*Sphaeromeria potentilloides*), and northern mule's-ears (*Wyethia amplexicaulis*). Threats to bugleg goldenweed are fire, cheatgrass invasion, construction and maintenance of trails and roads, ORVs, competition from nonnative species, herbicide application, and domestic livestock grazing.

***Thalictrum alpinum* (alpine meadowrue)**

Status

Alpine meadowrue is an R1 sensitive species that is considered globally secure (G5) but imperiled in Montana (S2).

Distribution

Alpine meadowrue has a circumpolar distribution that extends south to California, Nevada, New Mexico, and Utah. It also occurs in Alaska, Colorado, Idaho, Montana, Oregon, and Wyoming. In Montana, alpine meadowrue is documented from Beaverhead, Deer Lodge, and Granite Counties. In the Beaverhead-Deerlodge National Forest, alpine meadowrue is documented from the Pintler, Madison, and Dillon Ranger Districts and has the potential to occur in all other ranger districts.

Habitat Associations, Natural History, and Threats

Alpine meadowrue is a perennial forb in the buttercup family. In Montana, the species typically flowers in late May and June and fruits in July. Alpine meadowrue occurs in moist valley, montane, and lower subalpine areas, often in moist alkaline meadows and sometimes along stream channels. Alpine meadowrue occupies a range of substrates, including peat, marl, calcareous silt, silty clay, and clay loam, often of limestone parent material. In Montana, the species is documented from an elevation range of 4,855 to 8,280 feet. Threats to alpine meadowrue are hydrology alteration and overgrazing that results in stream downcutting and loss of riparian habitat.

***Thelypodium repandum* (wavy-leaf thelypody)**

Status

Wavy-leaf thelypody is an R4 sensitive species that is considered vulnerable globally (G3) and in Idaho (S3).

Distribution

Wavy-leaf thelypody is endemic to east-central Idaho, where it is documented in Custer and Lemhi Counties. Populations occur along the Salmon River and lower elevations of tributaries from Ellis to Clayton, along the East Fork Salmon River and tributaries, and south of Challis. In the Salmon-Challis National Forest, the species is documented from the Challis-Yankee Fork Ranger District.

Habitat Associations, Natural History, and Threats

Wavy-leaf thelypody is a biennial to perennial forb in the mustard family. The species occurs in the shrub-steppe zone on moderate to steep, unstable, generally southerly facing slopes of rocky, gravelly to cindery substrate derived from Challis volcanic and metamorphic rock with extensive bare ground and sparse vegetation (5 to 20 percent cover). Wavy-leaf thelypody is documented from elevations of 4,900 to 7,000 feet. Approximately half of the known occurrences are next to roads. Roadside populations are particularly vulnerable to road maintenance, weed control, mining, and ORVs.

***Trichophorum cespitosum* (tufted club-rush)**

Status

Tufted club-rush is an R1 sensitive species that is considered globally secure (G5) but imperiled in Montana (S2).

Distribution

Tufted club-rush has a circumboreal distribution that includes 19 of the United States. In the western United States, tufted club-rush extends as far south as Oregon, Idaho, Montana, and Utah. In the Beaverhead-Deerlodge National Forest, the species is documented from the Wise River Ranger District.

Habitat Associations, History

Tufted club-rush is a perennial graminoid that occurs in montane to alpine zones in wet meadows and sphagnum-dominated fens. The elevation range of tufted club-rush in Montana is 2,500 to 9,500 feet

***Trifolium eriocephalum* (woolly-head clover)**

Status

Woolly-head clover is an R1 sensitive species that is considered globally secure (G5) but imperiled in Montana (S2).

Distribution

Woolly-head clover is documented from California, Idaho, Montana, Nevada, Oregon, Utah, and Washington. In Montana, the species is known from the Bitterroot National Forest and could occur in the Beaverhead-Deerlodge National Forest.

Habitat Associations, Natural History, and Threats

Woolly-head clover is a perennial forb in the pea family. In Montana, the species typically flowers in May and June. Woolly-head clover occurs in dry meadows, woods, and margins in the foothill and lower montane zones. The elevation range of the species is 4,500 to 5,500 feet in Montana. Threats to woolly-head clover are invasive species, particularly spotted knapweed, and timber harvest and related road building.

***Trifolium gymnocarpon* (holly-leaf clover)**

Status

Holly-leaf clover is an R1 sensitive species that is considered globally secure (G5) but imperiled in Montana (S2).

Distribution

Holly-leaf clover is documented from Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Wyoming. In the Bitterroot National Forest, the species has the potential to occur in the Pintler Ranger District.

Habitat Associations, Natural History, and Threats

Holly leaf clover is a perennial forb to subshrub in the pea family. In Montana, the species typically flowers from May to June. Holly-leaf clover occurs in open woods and slopes, usually in dry soil of sagebrush steppe to ponderosa pine forest in the foothills to lower montane zone. In Montana, the elevation range of holly-leaf clover is approximately 4,800 to 6,300 feet. Nonnative species, particularly spotted knapweed, have been identified as a threat to this species.

Xanthoparmelia idahoensis (Idaho range lichen)

Status

Idaho range lichen is an R4 sensitive species that is considered critically imperiled globally (G1) and in Idaho (S1).

Distribution

Idaho range lichen is documented from widely disjunct localities in Colorado, Idaho, and Alberta. In Idaho, occurrences are recorded in the Middle Salmon-Panther and Lemhi hydrologic unit code 4 watersheds. Occurrences are documented on BLM-administered lands next to the Salmon-Challis National Forest, but none have been found in the forest.

Habitat Associations, Natural History, and Threats

Idaho range lichen occurs on calcareous badlands in sagebrush in the mountain rangelands of central Idaho. Idaho range lichen grows embedded in the substrate and is particularly vulnerable to ground-disturbing activities. Threats to this species are ORVs, livestock trampling, overgrazing, road maintenance and construction, conversion of shrub steppe to exotic annual grasslands, and increased fire frequency.

Alternative A—No Action

Infrastructure

Direct and Indirect Effects

Under Alternative A, management of infrastructure would continue to follow existing LUPs, and no changes would occur to the current National Forest System infrastructure, including power lines, wind turbines, solar panels, communications towers, fences, and roads. Although

mitigation is typically developed under the NEPA process and most ROWs and surface developments are subject to limited operation periods or other stipulations in local GRSG conservation strategies, permitted ROWs or SUAs would continue to allow construction, maintenance, and operation that could result in habitat loss, fragmentation, or degradation of GRSG habitat.

Construction, maintenance, and use of infrastructure and ancillary facilities would continue to lead to higher short-term concentrations of disturbance in GRSG habitat. Land tenure adjustments would be subject to current disposal, exchange, and acquisition criteria, which include retaining lands with threatened or endangered species, high quality riparian habitat, and plant and animal populations or natural communities of high interest.

Impacts on sensitive plants could result from construction and maintenance of infrastructure, such as power lines, communication towers, fences, and roads. In the footprint of permanent impacts, effects on sensitive plants could include direct mortality of individual plants or occurrences, loss of habitat, and reduction or loss of pollinators.

Impacts on sensitive plants also could result from temporary ground disturbance associated with temporary access route construction, laydown area establishment, and vegetation clearing, which could alter vegetation assemblages, compact soils, alter hydrology and sunlight penetration, impact pollinators, and promote the establishment and spread of invasive nonnative plants. Construction and maintenance of infrastructure would comply with LUPs and environmental laws and regulations, including NEPA, which would result in measures to avoid, minimize, or mitigate impacts on sensitive plants.

Although land tenure adjustments or withdrawals made in GRSG habitat could reduce the habitat available to sustain GRSG populations, unless provisions were made to ensure that GRSG conservation remained a priority under the new land management regime, land tenure adjustments would likely include retaining areas with GRSG and thus retaining occupied habitats under BLM or Forest Service management. This would reduce the likelihood of habitat conversion to agriculture, urbanization, or other uses that would remove sagebrush habitat and potentially impact sensitive plants that occur there.

Although infrastructure-related impacts could occur to any of the sensitive plants in Table 2, those for which infrastructure development or maintenance, particularly road construction or maintenance, has been identified as a primary threat are the following: Cusick's horse-mint, Goose Creek milkvetch, Lemhi milkvetch, Bitterroot milkvetch, dainty moonwort, western moonwort, slender moonwort, little grape fern, beautiful bryum, road construction, Idaho pennycress, Lemhi penstemon, least phacelia, Austin's knotweed, bugleg goldenweed, wavy-leaf thelypody, woolly-head clover, and Idaho range lichen.

Cumulative Effects

Current infrastructure management would continue under Alternative A. ROW exclusion or avoidance areas would not be instituted as they would be under Alternatives B, C, D, F, and G. Therefore, under Alternative A, the direct and indirect effects of infrastructure management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss

and fragmentation of the sagebrush habitat in MZ IV (refer to Chapter 5 of the FEIS) and contribute to negative cumulative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

Wildfire, prescribed burns, and fuels management would continue to follow current direction under Alternative A, which would impose fewer restrictions on these actions than the other alternatives. Prescribed burns and other fuels treatments involving vegetation thinning or removal (such as lop-and-scatter or mastication) could occur in a variety of vegetation types, including sagebrush. Associated impacts on plant species could include direct mortality to individuals as a result of fire or crushing by equipment or cut vegetation.

Fire-adapted plant species and those that favor early successional habitats could benefit. For example, Lemhi penstemon, which grows in mountain big sagebrush vegetation, has been shown to respond favorably to prescribed fire under certain conditions (Heidel and Shelly 2001). However, species that depend on mature sagebrush could be negatively affected by fire and associated changes in vegetation.

Additional impacts on sensitive plant species could result from the direct and indirect effects of fire suppression. Creating fire lines could result in direct mortality to individual plants or negative impacts of altering their habitat through soil disturbance, hydrology alteration, and establishment or spread of invasive nonnative species.

Applying fire retardant can negatively impact some plant species by killing entire plants, burning shoots and leaves, and reducing germination rates (Bell et al. 2005). Fire retardant also can have fertilizing effects and promote the spread of invasive nonnative species (Bell et al. 2005).

Longer term impacts on plant species could occur from fire suppression, which could initially result in higher rates of pinyon-juniper encroachment in some areas. In the initial stages of encroachment (phase 1), fuel loadings remain consistent with the sagebrush understory. As pinyon-juniper encroachment advances (phases 2 and 3) and the understory begins to thin, the depleted understory causes the stands to become resistant to wildfire and further alter fire return intervals. During years of high fire danger, the resulting heavy fuel loadings in these stands can contribute to larger-scale wildfires and confound control efforts due to extreme fire behavior. Such high-severity fires can negatively impact native plant species by promoting the establishment of exotics (Hunter et al. 2006).

Although impacts from fire and fuels management could occur on any of the sensitive plants in Table 2, fire has been identified as a major potential threat to primrose monkeyflower, Idaho pennycress, bugleg goldenweed, and Idaho range lichen. Fuels management has been identified as a potential major threat to little grape fern, and fire suppression has been identified as a major threat to Lemhi penstemon.

Cumulative Effects

Current wildfire suppression operations and fuels management activities would continue under Alternative A. The limitation or prohibition of prescribed fire in sagebrush habitats and the

sagebrush protection emphasis during wildland fire operations would not be instituted as they would be under Alternatives B, C, D, E or F. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, and the likelihood of increasing future fires from annual weed invasions and predicted climate change may increase loss and fragmentation of the existing sagebrush habitat from wildfire in MZ IV and V (refer to Chapter 5 of the FEIS). This could contribute to negative cumulative impacts on sensitive plants.

Invasive Plants

Direct and Indirect Effects

Invasive nonnative plants have been identified as a significant threat to over half of the sensitive plant species in Table 2. Under Alternative A, land use and management would continue in compliance with existing LUPs, and the introduction, spread, and treatment of invasive nonnative plants would be expected to follow current trends. New infestations would be highest along roads and in areas of heaviest use or ground disturbance (such as in campgrounds, energy development sites, and areas of concentrated recreation). Sensitive plants would continue to be impacted through direct competition with invasive species for water, light, and nutrients and by alteration of fire frequency and severity. Invasive species treatments would reduce these impacts, but the scale of invasive species infestations in the analysis area and the difficulty of effectively eradicating them are such that impacts on sensitive plants from invasive species infestations could not be completely avoided. Herbicides could impact sensitive plant species in treatment areas. This is most likely for sensitive species that grow in disturbed areas, such as roadsides. Herbicide use has been identified as a threat to Lemhi milkvetch, Sapphire rockcress, dainty moonwort, western moonwort, Idaho pennycress, Lemhi penstemon, least phacelia, salmon twin bladderpod, bugleg goldenweed, and wavy-leaf thelypody.

Cumulative Effects

Under Alternative A, current invasive species treatments, including mechanical, manual, chemical, and biological control, would continue in MZs IV (refer to Chapter 5 of the FEIS). The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Therefore, Alternative A's direct and indirect effects of invasive species management on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

Under Alternative A, conifer encroachment into sagebrush would follow existing trends, which is common and widespread in the Intermountain West. Sagebrush vegetation types susceptible to encroachment are Wyoming sagebrush, mountain big sagebrush, and black sagebrush. The encroachment of pinyon and juniper trees into sagebrush types in in their thermal zones is well documented, and Douglas-fir trees are known to encroach on high elevation sagebrush types. Increasing tree cover in sagebrush communities reduces or eliminates sagebrush and reduces the herbaceous understory. Conifer encroachment into sagebrush and other shrub types, which

would continue under Alternative A, would likely result in a loss of individuals or occurrences of sensitive plants found in the affected sagebrush types.

National Forests continue to implement vegetation treatments that curtail conifer encroachment into vegetation communities, including sagebrush. Treatments include prescribed fire, lop-and-scatter, and mechanical methods, such as mastication. These actions often coincide with Forest Service LUPs that contain objectives to maintain, restore, or improve sagebrush and other valued plant communities. Under Alternative A, impacts on sensitive plant species from prescribed fire and from other vegetation treatments that involve hand or mechanical methods are as described above for Fire and Fuels.

Although conifer encroachment has not been specifically identified as a primary threat to the species in Table 2, impacts could occur on any species in areas of conifer encroachment.

Cumulative Effects

Under Alternative A, conifer encroachment and its management would continue in MZ IV (refer to Chapter 5 of the FEIS), and the overall acreage occupied by conifers would continue to increase over time. Therefore, under Alternative A, the direct and indirect effects of conifer encroachment, when combined with past, present, and reasonably foreseeable future actions, could contribute to negative cumulative impacts on sensitive plants in habitats subject to encroachment in MZ IV.

Livestock Grazing

Direct and Indirect Effects

Under Alternative A, livestock grazing would continue under current management, with no expected change in AUMs, season-of-use, or other terms, conditions, or directives delineated in grazing permits or AMPs, although administrative actions may be implemented on a case-by-case basis to attain desired rangeland conditions. These conditions would be managed according to standards and guidelines designed to maintain healthy, sustainable, rangeland resources and to allow for the recovery of degraded rangelands.

The effects of grazing on sensitive plants are the following:

- Trampling, which can result in direct mortality of individuals and loss of entire occurrences
- Herbivory, which can result in direct mortality or reduced vitality and reproduction of individuals
- Alteration of habitat through soil compaction, which can reduce water infiltration, change hydrology, and render areas less suitable or unsuitable for sensitive plants
- Increased competition for light, nutrients, and water through the introduction or spread of nonnative invasive species, which may reduce sensitive plant species abundance or result in the loss of occurrences

The nature and extent of the impacts of livestock grazing on individuals, populations, and habitat quality of sensitive plants depend on the palatability of the species and their grazing and trampling tolerance, grazing intensity and timing, forage preferences of ungulates, soil

conditions, and hydrology. Although any of the sensitive plants in Table 2 could be impacted by livestock grazing, it has been identified as a primary threat to Cusick's horse-mint, pink agoseris, Goose Creek milkvetch, Lemhi milkvetch, meadow milkvetch, Bitterroot milkvetch, Sapphire rockcress, slender moonwort, peculiar moonwort, little grape fern, beautiful bryum, Idaho sedge, giant helleborine, Welsh buckwheat, Idaho pennycress, Lemhi penstemon, least phacelia, alkali primrose, mealy primrose, bugleg goldenweed, alpine meadowrue, and Idaho range lichen.

Cumulative Effects

Under Alternative A, livestock grazing would continue to be managed in MZ IV through existing grazing plans and methods and guidelines from existing plans. This would maintain ecological conditions according to Standards for Rangeland Health, which include maintaining healthy, productive, and diverse populations of native plants and animals. Therefore, the direct and indirect effects of livestock grazing on sensitive plants in MZs IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

Under Alternative A, mineral leasing and development would continue to be managed as it is now, with no additional provisions to conserve GRSG habitat. As such, this alternative would cause the greatest number of direct and indirect impacts on sensitive plant species and their habitats.

Impacts on sensitive plants from energy development would be similar to those for infrastructure development and maintenance. They could include direct mortality of individual plants or occurrences, loss of habitat in the disturbance footprint of new infrastructure, and reduction or loss of pollinators. Impacts on sensitive plants also could result from temporary ground disturbance (including constructing temporary access routes, establishing laydown areas, and clearing vegetation), which could alter vegetation assemblages, compact soils, alter hydrology and sunlight penetration, impact pollinators, and promote the establishment and spread of invasive nonnative plants.

Energy development would comply with LUPs and environmental laws and regulations, including NEPA, which would result in the implementation of measures to avoid, minimize, or mitigate impacts on sensitive plants. Although energy development has not been specifically identified as a primary threat to any of the plant species in Table 2, impacts could occur to any species that occurs in areas developed for energy.

Cumulative Effects

Current energy and development activities would continue under Alternative A. Areas to fluid minerals and other energy development and areas from mineral entry would not be closed or withdrawn as they would be under Alternatives B, C, D, and F. Therefore, under Alternative A, the direct and indirect effects of energy and development, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss and fragmentation of the sagebrush

habitat in MZ IV (refer to Chapter 5 of the FEIS) and contribute to negative cumulative impacts on sensitive plants.

Recreation

Direct and Indirect Effects

Under Alternative A, recreation would continue to be managed according to current direction, and associated impacts on sensitive plant species would follow existing trends. Recreation encompasses a wide range of activities that result in a variety of impacts on sensitive plants. Most recreation involves overland travel or the use of roads and trails. Associated impacts on sensitive plants could include direct mortality from trampling or crushing, reduced vitality and interference with reproduction from dust generation, habitat degradation from soil compaction and hydrology changes, and reduction in abundance or loss of occurrences from invasive nonnative species spread.

Impacts on sensitive plants from development of infrastructure to support concentrated recreation would be as discussed above under Infrastructure. Expanding or developing infrastructure to support recreation would follow existing direction and would comply with LUPs and environmental laws and regulations, including NEPA. This would result in the implementation of measures to avoid, minimize, or mitigate impacts on sensitive plants.

Of the sensitive plant species in Table 2, recreation has been identified as a primary threat to Lemhi milkvetch, peculiar moonwort, little grape fern, beautiful bryum, giant helleborine, primrose monkeyflower, Idaho pennycress, least phacelia, salmon twin bladderpod, bugleg goldenweed, wavy-leaf thelypody, and Idaho range lichen; however, under Alternative A, recreation could impact any of the plant species in the Table 2.

Cumulative Effects

Current recreation management would continue under Alternative A. The limitation on permitting recreational SUAs only if they were neutral or beneficial to GRSG would not be instituted, nor would other measures that focus on conserving GRSG habitat be instituted as they would under Alternatives B, C, D, and F. Under Alternative A, the direct and indirect effects from recreation management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss and fragmentation of the sagebrush habitat in MZ IV (refer to Chapter 5 of the FEIS) and contribute to negative cumulative impacts on sensitive plants.

Determination

Under the current condition, existing conservation measures limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species are possible. Therefore, Alternative A of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Alternative B—National Technical Team

Infrastructure

Direct and Indirect Effects

Under Alternative B, all PHMA would be managed as exclusion areas, GHMA would be managed as avoidance areas for new ROW and SUA projects, and new ROWs or SUAs would be collocating with existing infrastructure in PHMA and GHMA. Alternative B also would entail the following in PHMA:

- Collocation of new ROWs or SUAs with existing infrastructure
- Removal, burial, or modification of existing power lines
- Collocation of new facilities with existing facilities, where possible
- Use of existing roads or realignments to access valid existing rights that are not yet developed or constructing new roads to the absolute minimum standard necessary if valid existing rights could not be accessed via existing roads
- The establishment of a 3 percent threshold on anthropogenic disturbance (including highways, roads, geothermal wells, wind turbines, and associated facilities)

In addition, Alternative B would contain provisions to retain public ownership of GRSG PHMA and to acquire state and private lands with intact subsurface mineral estate where suitable conservation actions for GRSG could not otherwise be achieved.

Under Alternative B, impacts on sensitive plant species could include direct mortality, loss or degradation of habitat, and loss or reduction of pollinators. Although the types of infrastructure-related impacts would be similar to those under Alternative A, the 3 percent threshold that Alternative B would place on anthropogenic disturbance in PHMA would likely reduce the extent of those impacts in PHMA. As a result, limitations on disturbances could benefit individuals and occurrences of sensitive plants in PHMA.

Sensitive plants outside PHMA would likely experience little change in direct or indirect effects. However, if the 3 percent development threshold were to end up concentrating new infrastructure development outside PHMA, rather than just reducing it, the extent of impacts on sensitive plants outside PHMA could increase under Alternative B, relative to Alternative A. The proposal under Alternative B to potentially bury some power lines that cross PHMA could impact sensitive plant species through direct mortality or habitat degradation; however, because such actions would undergo site-specific environmental review, including NEPA, measures to avoid, minimize, or mitigate impacts on sensitive plants would be incorporated.

Cumulative Effects

Under Alternative B, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall benefit to sensitive plants. Therefore, the direct and indirect effects of infrastructure management on sensitive plants in MZ IV under Alternative B, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

Under Alternative B, fire suppression would be prioritized in PHMA to protect mature sagebrush habitat. Suppression would be prioritized in GHMA only where fires would threaten PHMA. Alternative B does not include any other specific wildland fire management actions in GHMA. Fuels treatments would be designed to protect sagebrush ecosystems by maintaining sagebrush cover, carefully evaluating the need for fuel breaks against additional sagebrush losses, applying seasonal restrictions for implementing management treatments, limiting fuels treatments in winter range, and emphasizing the use of native seed in restoration. Post-fuels treatments in PHMA would be designed to ensure long-term persistence of seeded areas and native plants and maintain 15 percent canopy cover. Fuels treatments in PHMA would including monitoring and controlling invasive nonnative plants, and implementing fuels management BMPs in PHMA would incorporate invasive plant prevention measures.

The types of impacts on sensitive plants associated with fire and fuels under Alternative B would be similar to those under Alternative A; however, the extent of those impacts and their distribution across the landscape would change. Under Alternative B, sensitive plant species requiring mature sagebrush would be expected to benefit from fire and fuels activities. Sagebrush species that require early successional sagebrush and those that are fire adapted or fire dependent may experience a reduction in suitable habitat over time. With its emphasis on minimizing fire in mature sagebrush, impacts on sensitive plants from suppression would be higher under Alternative B than Alternative A. Because reseeding would prioritize use of native seed in PHMA over other areas in years of short seed supplies, sensitive plants in areas outside PHMA could be more susceptible to habitat degradation from wildfire if limited seed availability were to reduce revegetation success outside PHMA.

Cumulative Effects

Under Alternative B, management actions associated with fire and fuels would increase protection of GRSG habitat, primarily in PHMA. Though such management could result in some negative impacts on sensitive plants, their overall effects would be neutral or beneficial. Therefore, the direct and indirect effects of fire and fuels management on GRSG habitat in MZ IV under Alternative B, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Invasive Plants

Direct and Indirect Effects

Under Alternative B, weed control would follow current direction, and the types of direct and indirect impacts on sensitive plants would be the same as those discussed under Alternative A. However, vegetation management conservation measures under Alternative B would prioritize restoration, including treatment of invasive nonnative plants, in GRSG habitats. This would provide a long-term benefit to sensitive plants in those habitats. Short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, from crushing or herbicide drift). Such impacts would be minimal because project level environmental

review would be done and appropriate avoidance or minimization measures would be incorporated.

Under Alternative B, the use of native seed would be favored in restoration, though nonnative seed could be used under certain circumstances. Forest Service policy (FSM 2070.3) already restricts the use of nonnative seed in restoration and prohibits the use of invasive species, so the impact of the native seed emphasis for restoration in Alternative B would be unlikely to result in any additional benefit to sensitive plant species relative to Alternative A. Monitoring and controlling invasive species after fuels treatments and at existing range improvements incorporated into Alternative B could benefit sensitive plant species by minimizing habitat degradation from invasive species. Overall, Alternative B would reduce impacts of invasive nonnative plants on sensitive plants relative to Alternative A.

Cumulative Effects

Under Alternative B, current invasive nonnative plant treatments in MZ IV (refer to Chapter 5 of the FEIS), including mechanical, manual, chemical, and biological control, would continue. The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Additional measures to conserve sagebrush habitat under Alternative B would provide further long-term benefits to sensitive plants in GRSG habitat. Therefore, Alternative B's direct and indirect effects of invasive species management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

As with Alternative A, Alternative B does not directly address conifer encroachment. The types of impacts of conifer encroachment and associated management actions on sensitive plants would be the same as those under Alternative A. Although the types of impacts would be the same, the conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts on sensitive plants associated with conifer encroachment. Impacts associated with managing conifer encroachment under Alternative B would decrease relative to Alternative A.

Cumulative Effects

Under Alternative B, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though it also would incorporate conservation measures protective of GRSG habitat. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on sensitive plants. Therefore, Alternative B's direct and indirect effects of conifer encroachment management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

Alternative B would incorporate GRSG habitat objectives and management considerations into livestock grazing management in PHMA. Actions would include the following:

- Completing range condition assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Modifying grazing systems to meet seasonal GRSG habitat requirements
- Improving management of riparian areas and wet meadows
- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Incorporating BMPs for West Nile virus
- Removing, modifying, or marking fences

Although the types of impacts on sensitive plants would be the same under Alternatives A and B, the level and extent of negative impacts would be reduced under Alternative B. Sensitive plants in PHMA would likely benefit from improving habitat conditions in uplands, riparian areas, meadows, and other wetlands. Almost half of the sensitive plant species in Table 2 occur in riparian areas, meadows, seeps, springs, and other wetland areas, which tend to be used more intensively by livestock than upland areas. Because of these factors and the focus of Alternative B on improving riparian, meadow, and other wetland habitat, sensitive wetland plant species may benefit from Alternative B more than upland species.

Cumulative Effects

Under Alternative B, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS). Additional measures to conserve sagebrush habitat under Alternative B would further minimize negative impacts on sensitive plants in GRSG habitat. Therefore, Alternative B's direct and indirect effects of livestock grazing on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

Alternative B addresses energy development directly with provisions for fluid energy development. Actions in Alternative B relevant to the analysis of impacts on sensitive plants are the following:

- Closing PHMA to fluid mineral leasing with possible exceptions
- Allowing geophysical exploration in PHMA only to obtain information about areas outside and next to PHMA
- Requiring exploratory operations in PHMA to be done using helicopter-portable drilling methods and in accordance with seasonal timing restrictions and any other restrictions
- In PHMA prohibiting new surface occupancy on federal leases

- For existing leases entirely in PHMA, applying NSO buffers around leks, and if the entire lease falls in this buffer, limiting disturbances to the 3 percent threshold
- Applying BMPs to limit the impact of operations on PHMA
- Applying BMPs to improve reclamation standards and successfully restore PHMA

All of these actions would likely reduce the level of impacts of fluid mineral development on sensitive plants relative to Alternative A.

Although Alternative B does not directly address wind energy development or industrial solar development, its 3 percent threshold for anthropogenic disturbances would apply to energy development and would limit the extent of all types of energy development in PHMA. Impacts on sensitive plants would be as discussed above for Infrastructure under Alternative B.

Cumulative Effects

Under Alternative B, some of the current energy development would continue in MZ IV; however, additional measures would conserve sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative B's direct and indirect effects on sensitive plants in GRSG habitat in MZ IV would minimize negative impacts on sensitive plants. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase negative impacts on sensitive plants.

Recreation

Direct and Indirect Effects

Under Alternative B, only recreation SUAs that are neutral or beneficial to GRSG would be permitted in PHMA. In addition, opportunities for road construction in PHMA would be limited, minimum standards would be applied, and upgrading roads in PHMA would be limited. Although the types of impacts on sensitive plants would be similar under Alternatives A and B, the degree and extent of impacts in PHMA would be reduced under Alternative B. The types of impacts that would decrease would be direct mortality from crushing or trampling, negative impacts from dust generation, habitat degradation from soil compaction and hydrology changes, and negative impacts of invasive nonnative species spread.

Cumulative Effects

Management actions associated with recreation under Alternative B would increase protection of GRSG habitat, primarily in PHMA, and would minimize the negative impacts of recreation on sensitive plants. As a result, recreation management under Alternative B, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plant species in MZ IV.

Determination

Under Alternative B, proposed conservation measures would limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species would be possible. Therefore, Alternative B of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or

habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Alternative C—Conservation Groups

Infrastructure

Direct and Indirect Effects

As with Alternative A, infrastructure-related impacts on sensitive plant species under Alternative C could include direct mortality, habitat loss or degradation, and pollinator loss or reduction. The extent of these impacts would be less overall than under Alternatives A and B. Under Alternative C, new transmission corridors, new ROWs for corridors, and new communication towers would be prohibited in occupied GRSG habitat, would be sited outside occupied GRSG habitat, and would be bundled with existing corridors to the maximum extent possible.

As for Alternative B, the proposal under Alternative C to potentially bury some existing power lines in occupied GRSG habitat could impact sensitive plant species through direct mortality or habitat degradation. Because power lines could be buried in a larger area than under Alternative B, which focuses on PHMA, more sensitive plant species could be impacted. However, such impacts would be minimized or avoided because burying power lines would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied for sensitive plants.

In addition to the above measures, which focus on specific types of infrastructure, Alternative C is similar to Alternative B in placing a 3 percent threshold on anthropogenic disturbance. However, Alternative C would apply that threshold throughout occupied GRSG habitat rather than limiting it to PHMA, as Alternative B would. Although under Alternative C impacts on the types of infrastructure would be similar to those under Alternative A, the 3 percent threshold that Alternative C would place on anthropogenic disturbance in GRSG habitat would likely reduce the extent of those impacts. As a result, limiting disturbances could benefit sensitive plants in occupied GRSG habitat. Sensitive plants outside occupied GRSG habitat would likely experience little change in direct or indirect effects. However, if the 3 percent development threshold were to concentrate new infrastructure development outside occupied GRSG habitat rather than just reducing, the extent of impacts on sensitive plants outside occupied GRSG habitat could increase under Alternative C relative to Alternative A.

Cumulative Effects

Under Alternative C, some of the current infrastructure management would continue in MZ IV (refer to Chapter 5 of the FEIS), but with measures added to conserve sagebrush habitat. Management actions associated with infrastructure under Alternative C would increase protection of GRSG habitat and provide an overall long-term benefit to the sensitive plants that occur there. Therefore, Alternative C’s direct and indirect effects of infrastructure on sensitive plants in MZs IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

The types of fire and fuels-related impacts of Alternative C on sensitive plants would be similar to those discussed for Alternative B. However, Alternative C expands most GRSG conservation elements to all occupied habitat rather than limiting them to PHMA. Because of this, the area those impacts could occur on would be larger. Elements of Alternative C that would be the most likely change the extent of direct and indirect beneficial and negative impacts on sensitive plants relative to Alternative B are as follows:

- Prioritizing suppression in all occupied habitat, rather than limiting it to PHMA
- Applying fuels management treatment provisions (including post-fire revegetation and invasive species control) to all occupied GRSG habitat rather than limiting them to PHMA

Additional fire and fuels-related impacts on sensitive plant species could result from the increased fire risk of eliminating grazing. Those impacts are discussed below under Livestock Grazing.

Cumulative Effects

The cumulative effects of management actions related to fire and fuels under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, would be similar to those described for Alternative B and would not substantially increase negative impacts on sensitive plants in MZ IV (refer to Chapter 5 of the FEIS).

Invasive Plants

Direct and Indirect Effects

Under Alternative C, invasive nonnative plant control efforts would follow current direction, and the types of direct and indirect impacts expected to sensitive plants would be the same as those discussed under Alternative A. As with Alternative B, vegetation management conservation measures under Alternative C would prioritize restoration, including treatment of invasive nonnative plants in GRSG habitats, which would provide a long-term benefit to sensitive plants. Unlike Alternative B, Alternative C would extend this focus beyond PHMA to all occupied GRSG habitat. As a result, sensitive plants outside PHMA but in occupied GRSG could experience a long-term benefit under Alternative C that they would not under Alternative B.

Under Alternative C, short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, by crushing or herbicide drift). Such impacts would be minimal because project-level environmental review would be done and appropriate avoidance or minimization measures would be incorporated.

The use of native seed would be favored in restoration under Alternative C, as it would be under Alternative B. Forest Service policy (FSM 2070.3) already restricts the use of nonnative seed in

restoration and prohibits the use of invasive species; for these reasons, the impact of the native seed emphasis for restoration in Alternative C is unlikely to result in a measurable additional benefit to sensitive plant species over Alternatives A or B. Monitoring and invasive species control after fuels treatments under Alternative C could benefit sensitive plant species by minimizing habitat degradation caused by invasive species. Overall, Alternative C would be likely to reduce impacts of invasive nonnative plants on sensitive plants relative to Alternative A and may provide a marginal benefit over Alternative B.

Cumulative Effects

Under Alternative C, current invasive plant management would continue in MZ IV (refer to Chapter 5 of the FEIS). The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. However, additional emphasis on protecting sagebrush habitat under Alternative C would provide an additional long-term benefit to sensitive plants in GRSG habitat. Therefore, the direct and indirect effects of invasive species management on sensitive plants in MZ IV under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

As with Alternatives A and B, Alternative C does not directly address conifer encroachment. The types of impacts of conifer encroachment and associated management actions on sensitive plants under Alternative C would be the same as those under Alternative A; however, the conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts of conifer encroachment on sensitive plants relative to Alternative A. Because those measures generally would apply throughout occupied GRSG under Alternative C but would be limited to PHMA under Alternative B, Alternative C could provide an additional reduction in the magnitude of impacts on sensitive plants from conifer encroachment relative to Alternative B. Because conifer encroachment measures would be applied over a larger area under Alternative C, negative impacts on sensitive plants from encroachment management discussed under Alternative A would be higher under Alternative C than under Alternatives A and B.

Cumulative Effects

Under Alternative C, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though it also would incorporate conservation measures protective of GRSG habitat. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on sensitive plants. Therefore, Alternative C's direct and indirect effects of conifer encroachment management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

Alternative C would prohibit grazing in and would remove all livestock water troughs, pipelines, and wells from occupied GRSG habitat. Sensitive plants in occupied GRSG habitat could benefit from improving habitat conditions in uplands, riparian areas, meadows, and other wetlands by the elimination of negative impacts discussed under Livestock Grazing for Alternative A. Sensitive species in Table 2 for which livestock grazing was identified as a major threat might benefit most from Alternative C. These are Cusick's horse-mint, pink agoseris, Goose Creek milkvetch, Lemhi milkvetch, meadow milkvetch, Bitterroot milkvetch, Sapphire rockcress, slender moonwort, peculiar moonwort, little grape fern, beautiful bryum, Idaho sedge, giant helleborine, Welsh buckwheat, Idaho pennycress, Lemhi penstemon, least phacelia, alkali primrose, mealy primrose, bugleg goldenweed, alpine meadowrue, and Idaho range lichen. As indicated in Table 2, almost half of these species occur in riparian areas, meadows, seeps, springs, and other wetland areas, which livestock tend to use more intensively than upland areas. As a result, the greatest benefit to sensitive plants from eliminating grazing in occupied GRSG habitat may be to these wetland species.

Total elimination of grazing from occupied GRSG habitat may result in additional indirect impacts on occupied GRSG habitats, surrounding areas, and the sensitive plants that occupy them. Moderate grazing reduces herbaceous fuel loads on sagebrush steppe rangelands and is considered likely to reduce the probability and severity of wildfires and the continuity and size of burned areas (Davies et al. 2010). Thus the elimination of grazing could benefit fire adapted, fire dependent, and early successional sensitive plants in currently grazed, occupied GRSG habitats and adjacent areas. For sensitive plants that are not fire tolerant or that require mature sagebrush habitat, negative impacts from the elimination of grazing could occur from wildfire in occupied sagebrush habitats and adjacent areas. The types of beneficial and negative impacts on sensitive plants would be as described under Fire and Fuels for Alternative A, though their extent and distribution across the landscape would likely differ.

Cumulative Effects

Under Alternative C, livestock grazing in MZ IV (refer to Chapter 5 of the FEIS) would be eliminated from all occupied GRSG habitat, which would provide an overall benefit to sensitive species that occur there. Therefore, the direct and indirect effects of livestock grazing on sensitive plant species in MZ IV under Alternative C, when combined with the past, present, and

reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

The types of impacts on sensitive plants from energy development under Alternative C would be the same as described under Alternatives A and B, though their magnitude and spatial distribution would differ. Alternative C would extend some of Alternative B's provisions to all occupied GRSG habitat rather than limiting them to PHMA. Actions in Alternative C relevant to the analysis of impacts on sensitive plants are the following:

- Closing occupied GRSG habitat to fluid mineral leasing, with possible exceptions
- Allowing geophysical operations in occupied GRSG habitat only to obtain information about areas outside and next to PHMA
- Requiring exploratory operations in occupied GRSG habitat to be done using helicopter-portable drilling methods and in accordance with seasonal timing restrictions or other applicable restrictions
- In occupied GRSG habitat, prohibiting new surface occupancy on federal leases
- For existing leases entirely in occupied GRSG habitat, applying NSO buffers around leks, and if the entire lease falls in this buffer, limiting disturbances in sections to the 3 percent threshold

All of these actions would likely reduce the level of impacts of fluid mineral development on sensitive plants relative to Alternative A. Since these actions would apply to all occupied GRSG habitat rather than just PHMA, they also could reduce the level of impacts of fluid mineral development on sensitive plants relative to Alternative B.

Unlike Alternative B, Alternative C would directly address solar energy development by prohibiting it in occupied GRSG habitat and requiring it to be sited at least five miles from active GRSG leks. These actions could reduce negative impacts of energy development on sensitive plants in occupied GRSG habitat, relative to Alternative A. They also could reduce negative impacts of energy development in occupied GRSG outside PHMA, relative to Alternative B.

In addition to the provisions in Alternative C that specifically address energy development, the 3 percent threshold for anthropogenic disturbances would limit the extent of all types of energy development in occupied GRSG habitat. Impacts on sensitive plants would be as discussed above for Infrastructure under Alternative C.

Cumulative Effects

Under Alternative C, measures to conserve occupied sagebrush habitat would be applied to energy development in MZ IV, which would provide an overall benefit to sensitive plant species. As a result, Alternative C's direct and indirect effects of energy development on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants (refer to Chapter 5 of the FEIS).

Recreation

Direct and Indirect Effects

Similar to Alternative B, Alternative C would allow Recreation SUAs that are neutral or beneficial to GRSG, but Alternative C would extend this provision to all occupied habitat rather than restricting it to PHMA. Opportunities for road construction in occupied GRSG habitat would be limited, minimum standards would be applied, existing roads could not be upgraded, and cross country driving would be prohibited in occupied GRSG habitat.

Although the types of impacts on sensitive plants would be similar under Alternatives A, B, and C, the degree and extent of impacts in occupied GRSG habitat would be reduced under Alternative C relative to Alternative A. The degree and extent of impacts in occupied GRSG habitat outside PHMA would be reduced under Alternative C relative to Alternative B. The types of impacts that would decrease are direct mortality from crushing or trampling individuals, negative impacts of dust generation, habitat degradation of soil compaction and changes in hydrology, and negative impacts of the spread of invasive nonnative species.

Cumulative Effects

Under Alternative C, some of the current travel, transportation, and recreation management direction would continue in MZ IV (refer to Chapter 5 of the FEIS); however, measures would be added to conserve sagebrush habitat, which would provide an overall long-term benefit to sensitive plants that occur there. Therefore, management of recreation under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plant species in MZ IV.

Determination

Under Alternative C, proposed conservation measures would limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species would be possible. Therefore, Alternative C of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Alternative D—Idaho and Southwest Montana Sub-region

<u>Infrastructure</u>

Direct and Indirect Effects

Although the types of infrastructure-related impacts on sensitive plants under Alternative D would be similar to those discussed above for Alternative A, Alternative D would include actions that could change the extent of those impacts and their distribution across the landscape. This analysis focuses on the elements of Alternative D that would be most relevant to impacts on sensitive plants. In PHMA, IHMA, and GHMA, ROW avoidance areas would be designated and the following types of new development would be prohibited:

- Transmission facilities greater than 50 kV
- Wind energy testing and development

- Commercial solar and geothermal development
- Nuclear development
- Gas or oil developments
- Airports
- Paved or gravel roads
- Landfills

In PHMA, IHMA, and GHMA, new authorizations or amendments to existing ROW and land use authorizations would be sited substantially in existing disturbances where feasible, and new ROW and land use authorizations would be sited outside 1.86-mile occupied lek avoidance areas. These conservation measures would reduce the level of negative impacts from infrastructure relative to Alternative A and may provide some additional reduction in impacts over Alternative B.

Some infrastructure related elements of Alternative D could increase negative impacts on sensitive plants relative to Alternatives A and B. Alternative D would require new power and communication lines in PHMA, IHMA, and GHMA outside existing ROWs to be buried where feasible. Burying utilities could impact sensitive plant species through direct mortality or habitat degradation. Because power lines could be buried in a larger area than under Alternative B, which focuses on PHMA, more sensitive plant species or occurrences could be impacted. However, such impacts would be minimized or avoided because burying power lines would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied for sensitive plants.

Cumulative Effects

Under Alternative D, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall benefit to sensitive plants in it. Therefore, the direct and indirect effects of lands and realty management on sensitive plants in MZ IV under Alternative D, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

Like Alternative B, Alternative D would prioritize fire suppression and restoration in sagebrush areas using native plants. In addition, Alternative D would include planning and firefighter training to prepare for fire outbreaks in PHMA, IHMA, and GHMA, would use fuels reduction and green strips in PHMA, IHMA, and GHMA to strategically reduce fire effects, and would delineate conifer encroachment areas in PHMA, IHMA, and GHMA to manage wildfire for resource benefit.

The types of impacts on sensitive plants associated with fire and fuels would be similar to those discussed under Alternative A, but their extent and distribution across the landscape would differ. Excluding fire from PHMA, IHMA, and GHMA would have similar impacts on sensitive plants as those discussed under Alternative B; however, measures that expand sagebrush habitat

conservation to PHMA, IHMA, and GHMA could provide an additional benefit to sensitive plants that require mature sagebrush habitat.

Cumulative Effects

Under Alternative D, management actions associated with fire and fuels would increase protection of PHMA, IHMA, and GHMA. Though such management could result in some negative impacts on sensitive plants, overall their effects would be neutral or beneficial. Therefore, Alternative D's direct and indirect effects of fire and fuels management on GRSG habitat in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Invasive Plants

Direct and Indirect Effects

Under Alternative D, invasive nonnative plant control would follow current direction, and the types of direct and indirect impacts expected on sensitive plants would be the same as those under Alternative A. Like Alternative B, vegetation management conservation measures under Alternative D would prioritize restoration, including treatment of invasive nonnative plants, in GRSG habitats. This would provide a long-term benefit to sensitive plants in those habitats. Alternative D would apply this to PHMA, IHMA, and GHMA. Alternative D would emphasize restoration in the following PHMA, IHMA, and GHMA:

- Sites with favorable environmental variables
- Seasonal habitats that are thought to be limiting GRSG distribution or abundance
- Sites otherwise suitable for GRSG but lacking adequate sagebrush cover
- Sagebrush areas lacking adequate desirable understory vegetation

As a result, sensitive plants in and next to areas restored could experience a long-term benefit.

Under Alternative D, short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, by crushing or herbicide drift). Such impacts would be minimal because project level environmental review would be done and appropriate avoidance or minimization measures would be incorporated.

The use of native seed would be favored in restoration under Alternative D, as it would be under Alternative B. Forest Service policy (FSM 2070.3) already restricts the use of nonnative seed in restoration and prohibits the use of invasive species; thus, the impact of the native seed emphasis for restoration in Alternative D is unlikely to result in a measurable additional benefit to sensitive plant species over Alternatives A or B.

As under Alternative B, invasive species monitoring and control after fuels treatments under Alternative D could benefit sensitive plant species by minimizing habitat degradation from invasive species. Overall, Alternative D would reduce impacts of invasive nonnative plants on sensitive plants relative to Alternative A and similar to Alternative B.

Cumulative Effects

Under Alternative D, current invasive species management in MZ IV (refer to Chapter 5 of the FEIS) would continue. The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Additional measures to conserve sagebrush habitat and restore degraded sagebrush habitat under Alternative D would provide a further net benefit to sensitive plants in PHMA, IHMA, and GHMA. Therefore, Alternative D's direct and indirect effects of invasive species management on GRSG in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

Alternative D would address conifer encroachment more directly than Alternatives A, B, or C by emphasizing vegetation rehabilitation projects that reduce conifer encroachment into important GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in PHMA, IHMA, and GHMA. The types of impacts on sensitive plants from conifer encroachment and associated management actions under Alternative D would be the same as those described under Alternative A. Collectively, elements of Alternative D that address conifer encroachment would likely reduce the magnitude of the negative impacts on sensitive plants from conifer encroachment relative to Alternative A. Negative impacts associated with managing conifer encroachment under Alternative D would increase, relative to Alternatives A, B, and C, because Alternative D would take a more direct approach at managing conifer encroachment.

Cumulative Effects

Under Alternative D, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate GRSG habitat conservation measures that directly addressed conifer encroachment. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on sensitive plants. Therefore, Alternative D's direct and indirect effects of conifer encroachment management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

Alternative D would include most of the same measures as Alternative B to address livestock grazing, although in many cases it would extend those measures beyond PHMA to IHMA and GHMA. Like Alternative B, Alternative D would manage for vegetation composition (including riparian and lentic areas) and structure, consistent with appropriate GRSG seasonal habitat objectives relative to site potential. In addition, Alternative D would consider retiring grazing in PHMA, IHMA, and GHMA if grazing privileges were relinquished or an allotment became vacant.

Although the types of impacts on sensitive plants would be the same as under Alternative A, the level and extent of negative impacts would likely be reduced under Alternative D. Sensitive plants in PHMA, IHMA, and GHMA would likely benefit from improving habitat conditions in uplands, riparian areas, meadows, and other wetlands.

Almost half of the sensitive plant species in Table 2 occur in riparian areas, meadows, seeps, springs, and other wetland areas, which livestock tend to use more intensively than upland areas. Because of these factors and the inclusion of measures to improve riparian, meadow, and other wetland habitat, sensitive wetland plant species may benefit from Alternative D more than upland species.

Cumulative Effects

Under Alternative D, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS). Additional measures to conserve existing sagebrush habitat under Alternative D would further minimize negative impacts on sensitive plants that occurred in GRSG habitat. Therefore, Alternative D's direct and indirect effects of livestock grazing on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

The types of impacts on sensitive plants from energy development under Alternative D would be the same as described above under Alternatives A and B, though their magnitude and spatial distribution would differ. As with Alternative B, Alternative D would conserve GRSG habitat. Actions in Alternative D that would be particularly relevant to the analysis of impacts on sensitive plants are the following:

- Closing most PHMA and IHMA to future fluid mineral leasing and development
- Placing additional stipulations and seasonal restrictions on existing fluid mineral leases in PHMA, IHMA, and GHMA to minimize potential impacts
- Stipulating a maximum 3 percent surface disturbance per section for future fluid mineral leases in PHMA and IHMA

These actions would reduce the impacts of fluid mineral development on sensitive plants relative to Alternative A and to a level similar to that of Alternative B.

Unlike Alternative B, Alternative D would directly address solar and wind energy development. In PHMA, Alternative D would prohibit new wind and solar energy development. In IHMA, Alternative D would restrict wind and solar energy development where adverse effects could not be mitigated; however, ancillary facilities, such as roads and power lines, could be authorized if the action would result in no net loss of GRSG after mitigation. Alternative D would make GHMA an avoidance area for wind and solar development. These actions would be likely to reduce the negative impacts of energy development on sensitive plants in PHMA, IHMA, and GHMA, relative to Alternatives A and B.

Cumulative Effects

Under Alternative D, some of the current energy development would continue in MZ IV; however, additional measures would conserve sagebrush habitat and provide an overall long-term benefit to the sensitive plant species there. Therefore, Alternative D's direct and indirect effects on sensitive plants in GRSG habitat in MZ IV would minimize negative impacts on sensitive plants in GRSG habitat. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase negative impacts on sensitive plants.

Recreation

Direct and Indirect Effects

Alternative D would apply measures to reduce the potential negative impacts of recreation on GRSG. The measures that are most relevant to impacts on sensitive plants are the following:

- Analyzing Special Recreation Permits on a case-by-case basis and directing use away from sensitive seasons and areas in PMHA, IMHA, and GHMA
- Designating or designing developed recreation sites and associated facilities to direct use away from sensitive areas in PHMA, IHMA, and GHMA
- Incorporating seasonal restrictions for authorized activities to minimize impacts on GRSG habitat in PHMA, IHMA, and GHMA

Under Alternative D, these measures would reduce the general impacts of recreation on GRSG that were described under Alternative A. Although the types of impacts on sensitive plants would be similar under Alternatives A, B, and D, the degree and extent of impacts in GRSG habitat would be lower under Alternative D. This is because it includes additional measures focused on minimizing recreation impacts and applying those measures to PHMA, IHMA, and GHMA. The types of impacts that would decrease under Alternative D include direct mortality from crushing or trampling individuals, negative impacts of dust generation, habitat degradation of soil compaction and hydrology changes, and negative impacts of invasive nonnative species spread.

Cumulative Effects

Management actions for recreation under Alternative D would increase protection of PHMA, IHMA, and GHMA in MZ IV and would minimize the negative impacts of recreation on

sensitive plants in those areas. Therefore, when combined with the past, present, and reasonably foreseeable future actions, and recreation management in MZ IV under Alternative D would not substantially increase negative impacts on sensitive plant species.

Determination

Under Alternative D, proposed conservation measures would limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species would be possible. Therefore, Alternative D of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Alternative E1—Idaho Governor's Alternative

Infrastructure

Direct and Indirect Effects

The types of infrastructure-related impacts on sensitive plants under Alternative E1 would be similar to those discussed above for Alternative A. They could include direct mortality, habitat loss or degradation, and pollinator loss or reduction.

As with Alternative B, Alternative E1 would include actions to minimize the impact of infrastructure on GRSG. Core habitat would be identified as a ROW avoidance area, with limited exceptions. IHMA also would be identified as a ROW avoidance area, but new ROWs and infrastructure would be permissible under certain criteria. In core habitat, new infrastructure would be collocated with existing infrastructure to the maximum extent practicable.

In many instances, mitigation would be required for unavoidable infrastructure impacts in GRSG habitats. Within core habitat and IHMA and to the extent possible, linear facilities would be collocated within .62 mile of linear facilities. Under Alternative E1 and relative to Alternative A, these actions would likely reduce the negative impacts of infrastructure development and operations on sensitive plants.

Because Alternative E1 would include fewer limitations on infrastructure in GRSG habitat than Alternative B, the potential for some infrastructure-related impacts on sensitive plants may be higher under Alternative E1. However, unlike Alternative B, Alternative E1 would not promote the undergrounding of utilities and eliminates potential associated impacts on sensitive plants.

Because project-level environmental review would be done under all alternatives, and measures to minimize or avoid impacts on sensitive plants would be implemented, the difference in infrastructure-related impacts on sensitive plants under Alternatives B and E1 would be negligible.

Cumulative Effects

Under Alternative E1, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall benefit to sensitive plants there. Therefore, Alternative E1's direct and indirect effects of

infrastructure on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

Alternative E1 would focus resources to reduce wildfire in sagebrush areas, prioritize fire suppression in core, IHMA, and GHMA, and maintain fuel breaks in core and IHMA. Fuels treatments would protect existing sagebrush ecosystems. Fire response times to core and IHMA would be reduced to limit fire damage. This alternative is unique in that adaptive management would be used to account for acres of habitat lost to fire in core and IHMA. These measures would reduce the threat of wildfire to sagebrush and would reduce damage to GRSG habitat. The short-term and long-term impacts from fire suppression and fuels treatments on sensitive plants would be similar to those under Alternative A; the long-term impacts of fire exclusion from focal sagebrush habitats on sensitive plants would be similar to those of Alternative B.

Cumulative Effects

Under Alternative E1, management actions associated with fire and fuels would increase protection of GRSG habitat. Though such management could result in some negative impacts on sensitive plants, their overall effects would be neutral or beneficial. Therefore, Alternative E1's direct and indirect effects of fire and fuels management on GRSG habitat in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Invasive Plants

Direct and Indirect Effects

Alternative E1 would maintain the policies described under Alternative A and would have the same type of impacts on sensitive plants. In addition, Alternative E1 would include the following measures to minimize the impact of invasive nonnative plants on core, IHMA, and GHMA

- Manage to prevent invasion
- Eradicate or control invasive nonnative plants
- monitor invasive nonnative plants for three years following a fire in core and IHMA

The actions under Alternative E1 would significantly reduce the level of impacts of invasive nonnative plants on sensitive plants relative to Alternative A. Under Alternative E1, short-term impacts of invasive plant treatments and other restoration actions, particularly those that would involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, by crushing or herbicide drift). Such impacts would be minimal because project-level environmental review would be done and appropriate avoidance or minimization measures would be incorporated.

Cumulative Effects

Under Alternative E1, current invasive nonnative plant treatments in MZ IV (refer to Chapter 5 of the FEIS), including mechanical, manual, chemical, and biological control of invasive plants, would continue. The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Additional measures to conserve sagebrush habitat under Alternative E1 would provide further long-term benefits to sensitive plants in GRSG habitat. Therefore, Alternative E1's direct and indirect effects of invasive species management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

As with Alternative D, Alternative E1 would include measures to directly address conifer encroachment. It would prioritize conifer removal in core and IHMA using methods that would minimize disturbance to the extent possible. Conifer encroachment projects would focus on areas with the highest restoration potential, as evidenced by low canopy cover, sagebrush understory, and adjacent GRSG populations. These projects would not be conducted in juniper stands older than one hundred years. As described above Invasive Plants, core, IHMA, and GHMA would be managed to prevent nonnative plant invasions. The types of impacts on sensitive plants from conifer encroachment and associated management actions under Alternative E1 would be similar to those described under Alternative A.

Collectively, elements of Alternative E1 that address conifer encroachment would likely reduce the magnitude of the negative impacts of conifer encroachment on sensitive plants, relative to Alternative A. However, negative impacts of conifer encroachment management actions under Alternative E1 would increase, relative to Alternatives A, B, and C because Alternative E1 would prioritize conifer removal. The negative impacts of conifer encroachment management on sensitive plants would be minimized by project-specific NEPA review and the incorporation of avoidance or minimization measures.

Cumulative Effects

Under Alternative E1, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate conservation measures protective of GRSG habitat. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial long-term effect on sensitive plants. Therefore, Alternative E1's direct and indirect effects of conifer encroachment management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

Management under Alternative E1 would add GRSG guidelines to grazing management plans in core and IHMA. Rangeland health assessments using published characteristics of GRSG habitat and the ecological site descriptions would be conducted in core and IHMA. Allotments in core

habitat with declining GRSG populations would be prioritized, followed by allotments in IHMA that contained breeding habitats with decreasing lek counts. If assessments were to determine that livestock grazing was limiting desired habitat characteristics, grazing permits would be adjusted during the renewal process to include measures to achieve desired conditions.

Although the types of impacts on sensitive plants would be the same under Alternative E1 as described under Alternative A, the level and extent of negative impacts would likely be reduced. Sensitive plants in core and IHMA would likely benefit from improving habitat conditions. Relative to Alternative B, Alternative E1 would focus less management on riparian areas, meadows, and other wetlands; thus, sensitive plant species in those habitats would experience fewer beneficial effects under Alternative E1 than under Alternative B.

Cumulative Effects

Under Alternative E1, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS). Additional measures to conserve sagebrush habitat under Alternative E1 would further minimize negative impacts on sensitive plants in GRSG habitat. Therefore, Alternative E1's direct and indirect effects of livestock grazing on sensitive plants, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

Alternative E1 would follow much of the current guidance on leasing and developing mineral resources but would add measures to minimize impacts on GRSG. Limitations on energy development that are relevant to the analysis of impacts on sensitive plants are the following:

- in core and IHMA, exploration for oil and gas using temporary roads would be permissible if site disturbance were minimized
- In core and IHMA, surface occupancy for oil and gas development would not be allowed unless the surface development would not accelerate or cause declines in GRSG populations
- Surface disturbance from roads associated with fluid mineral development would be limited to 3 percent in core habitat and 5 percent in IHMA of suitable habitat per an average of 640 acres
- Wind energy development projects would comply with all infrastructure development BMPs and the USFWS Wind Energy Guidelines.

The types of impacts on sensitive plants from energy development under Alternative E1 would be the same as under Alternatives A and B, though their magnitude and spatial distribution would differ. Measures associated with energy development under Alternative E1 would be likely to reduce the impacts of fluid mineral development and wind energy on sensitive plants relative to Alternative A. Under Alternative E1, measures limiting the impacts of energy development on GRSG habitat would be less restrictive overall than under Alternative B, so impacts on sensitive plants may be higher than under Alternative B.

Cumulative Effects

Under Alternative E1, some of the current energy development would continue in MZ IV; however, additional measures would conserve sagebrush habitat. Therefore, Alternative E1's direct and indirect effects on sensitive plants in GRSG habitat in MZ IV would minimize negative impacts on sensitive plants. When combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Recreation

Direct and Indirect Effects

Alternative E1 would apply measures to reduce the potential negative impacts of recreation on GRSG. The measures that are most relevant to impacts on sensitive plants are the following, which would apply in core and IHMA:

- Restricting vehicle use to existing routes until comprehensive travel management plans were complete
- Rerouting routes during travel management planning, where appropriate, to reduce impacts on GRSG

The types of recreation-related impacts under Alternative E1 would be the same as described above for Alternative A, but its measures would reduce impacts from transportation. Because Alternative E1 would address recreation mainly through travel management, whereas Alternative B would address recreation more broadly, recreation impacts on sensitive plants under Alternative E1 would be higher than under Alternative B.

Cumulative Effects

Under Alternative E1, some of the current recreation management direction would continue in MZ IV; however, additional measures would increase protection of GRSG habitat and minimize the negative impacts of recreation on sensitive plants. As a result, recreation management in MZ IV under Alternative E1, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plant species.

Determination

Under Alternative E1, proposed conservation measures would limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species would be possible. Therefore, Alternative E1 of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Alternative E2—Utah Governor's Alternative

Infrastructure

Direct and Indirect Effects

For all ROWs and SUAs in PHMA, management stipulations and conditions would focus on

mitigating direct disturbance to GRSG during construction. PHMA would be designated as an avoidance area for new ROWs and SUAs, which would be less protective of GRSG habitat than Alternatives B, C, or F but would similar to Alternatives D and E1.

Similar to Alternatives B, C, and F, Alternative E2 would include a disturbance cap. However, Alternative E2 would apply a 5 percent disturbance cap, as opposed to a 3 percent disturbance cap. The areas that the caps would apply to and the types of disturbances that contribute to the caps would differ.

Similar to Alternative D, Alternative E2 directly addresses siting wind energy facilities; however, it would be less restrictive than Alternative D by avoiding rather than excluding energy developments in PHMA and applying BMPs and industry, state, and federal stipulations in cases where siting in PHMA could not be avoided.

Similar to Alternative E1, Alternative E2 would not promote undergrounding utilities. Where feasible and consistent with federally required electrical separation standards, electrical transmission lines and new linear transmission features would be sited in existing corridors, or at a minimum, in concert with existing linear features in GRSG habitat. No specific management actions would be provided for GRSG outside PHMA.

The types of infrastructure-related impacts on sensitive plants under Alternative E2 would be similar to those discussed for Alternative A and could include direct mortality, habitat loss or degradation, and pollinator loss or reduction. However, measures to minimize infrastructure impacts in PHMA under Alternative E2 would likely reduce the negative impacts on sensitive plants relative to Alternative A.

Because Alternative E2 would include fewer limitations on infrastructure in GRSG habitat than Alternative B, the potential for some infrastructure-related impacts on sensitive plants may be higher under Alternative E2. However, unlike Alternative B but similar to Alternative E1, Alternative E2 would not promote the undergrounding of utilities and therefore would eliminate potential associated impacts on sensitive plants.

Because project-level environmental review would be done under all alternatives, and measures to minimize or avoid impacts on sensitive plants would be implemented, the difference in infrastructure-related impacts on sensitive plants under Alternatives B and E2 would be negligible.

Cumulative Effects

Under Alternative E2, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall long-term benefit to sensitive plants. Therefore, Alternative E2's direct and indirect effects of infrastructure on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

Alternative E2 would implement the following unique strategies to address the response to fire and to reduce the general effects of fire on GRSG habitat

- Create and implement a statewide fire agency agreement that would eliminate jurisdictional boundaries and allow for immediate response to natural fire in PHMA
- Allow the use of fire-retardant vegetation that would buffer areas of high quality GRSG habitat from catastrophic fire
- Use prescriptive fire with caution in sagebrush habitat, only at higher elevations, and in a manner designed prescriptively to benefit GRSG
- Conduct effective research into controlling fire size and protecting remaining GRSG areas next to high-risk cheatgrass areas
- Focus research efforts on effective reclamation and restoration of landscapes altered by wildfire
- Manage winter habitat to maintain maximum amount of sagebrush, especially tall sagebrush (80 percent), which would be available to GRSG above snow during a severe winter
- Coordinate the needs and efforts related to GRSG with the State of Utah committee that was formed to develop a process to protect the health and welfare by reducing the size and frequency of catastrophic fires

Similar to Alternative B, Alternative E2 would consider the use of prescriptive grazing to specifically reduce fire size and intensity on all types of landownership, where appropriate.

Measures implemented under Alternative E2 would reduce the threat of wildfire to sagebrush and reduce damage to GRSG habitat. The types of short-term and long-term impacts of fire suppression and fuels treatments on sensitive plants would be similar to those under Alternative A; the long-term impacts of fire exclusion from focal sagebrush habitats on sensitive plants would be similar to those of Alternative B.

Cumulative Effects

Under Alternative E2, management actions associated with fire and fuels would increase protection of GRSG habitat. Though such management could result in some negative impacts on sensitive plants, their overall effects would be neutral or beneficial. Therefore, Alternative E2's direct and indirect effects of fire and fuels management on GRSG habitat in MZ IV, when combined with the past, present, and reasonably foreseeable future actions would not substantially increase negative impacts on sensitive plants.

Invasive Plants

Direct and Indirect Effects

Like most of the other alternatives, Alternative E2 would include conservation measures to address invasive plants. Under Alternative E2, land managers would respond aggressively to new infestations to keep invasive species from spreading. Every effort would be made to identify and treat new infestations before they became larger problems. Additionally, containment of known infestations in or near sagebrush habitats would be a high priority for all land management. Vegetation management tools described above for Fire and Fuels and below for Livestock

Grazing would help to reduce the general impacts of invasive plants on sensitive plants in GRSG habitat, as described under Alternative A.

The actions under Alternative E2 would significantly reduce the level of impacts of invasive nonnative plants on sensitive plants relative to Alternative A to levels similar to those under Alternative E1. Under Alternative E2, short-term impacts of invasive plant treatments and other restoration actions, particularly those that would involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, by crushing or herbicide drift). Such impacts would be minimal because project-level environmental review would be done and appropriate avoidance or minimization measures would be incorporated.

Cumulative Effects

Under Alternative E2, current invasive nonnative plant treatments in MZ IV (refer to Chapter 5 of the FEIS) would continue. The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Additional measures to conserve existing sagebrush habitat under Alternative E2 would provide further long-term benefits to sensitive plants in GRSG habitat. Therefore, alternative E2's direct and indirect effects of invasive species management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

Similar to Alternative E1, Alternative E2 includes a habitat restoration and vegetation management conservation measure specific to conifer encroachment that would aggressively remove encroaching conifers and other plant species to expand GRSG habitat where possible. In comparison, however, Alternative D would address conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. The types of impacts on sensitive plants from conifer encroachment and associated management actions under Alternative E2 would be similar to those described under Alternative A.

Collectively, elements of Alternative E2 that address conifer encroachment would likely reduce the magnitude of the negative impacts of conifer encroachment on sensitive plants relative to Alternative A. In contrast, negative impacts of conifer encroachment management actions under Alternative E2 would increase, relative to Alternatives A, B, and C because Alternative E2 would prioritize conifer removal. However, the negative impacts of conifer encroachment management on sensitive plants would be minimized by project-specific NEPA review and the incorporation of avoidance or minimization measures.

Cumulative Effects

Under Alternative E2, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate conservation measures protective of GRSG habitat. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial long-term effect on sensitive plants. Therefore, Alternative E2's direct and indirect effects of conifer encroachment

management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

Alternative E2 would continue to make GRSG PHMA and GHMA available for livestock grazing. Should site-specific concerns be raised about the effect of grazing on GRSG habitat, and should such effects be documented over a sufficient time frame, corrective management actions would be addressed through the application of BMPs. Incompatible grazing strategies would be addressed through established rangeland management practices, consistent with the maintenance or enhancement of habitat.

GRSG seasonal habitat requirements would be considered when managing sagebrush rangelands. Water developments would be designed to enhance mesic habitat for use by GRSG and to maintain adequate vegetation in wet meadows. In PHMA, GRSG stipulations would take precedence over stipulations for other species if there were conflicts, if otherwise allowable by law. New infestations of invasive exotic plants would be responded to aggressively to prevent their spread. Overall, measures associated with livestock grazing under Alternative E2 would be less protective of GRSG and their habitat than those under Alternatives B, C, D, or F.

Although the types of impacts on sensitive plants would be the same under Alternative E2 as under Alternative A, the level and extent of negative impacts would likely be slightly reduced. Sensitive plants in GRSG habitat could benefit from improving habitat conditions. Relative to Alternative B, Alternative E2 would focus less management on riparian areas, meadows, and other wetlands, so sensitive plant species in those habitats would experience fewer beneficial effects under Alternative E2 than under Alternative B.

Cumulative Effects

Under Alternative E2, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS), and additional measures to conserve sagebrush habitat under Alternative E2 could reduce negative impacts on sensitive plants in GRSG habitat. Therefore, Alternative E2's direct and indirect effects of livestock grazing on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

Under Alternative E2, PHMA would be considered suitable for further coal leasing and the extraction through underground mining. PHMA and GHMA that is not already withdrawn or proposed for withdrawal would be available for locatable mineral entry. PHMA would be open to mineral materials and oil and gas leasing and would be an avoidance area for wind energy development, although it would not be precluded.

All of the aforementioned forms of energy development, as well as nonenergy leasable mineral lands, solid mineral exploration, and geophysical exploration activities, would be subject to the following stipulations, as well as BMPs accepted by industry and state and federal agencies:

- New permanent disturbance, including structures, fences, and buildings, should not be in the occupied lek itself
- Permanent disturbance should not be allowed within 1 mile of an occupied lek, unless it is not visible to the GRSG using the lek
- Time-of-day (when the lek is active) and seasonal stipulations applying to specific habitats would be applied and based on site-specific conditions, in coordination with the local UDWR biologist
- Disturbance in PHMA would be avoided, if possible, or minimized by locating developments in habitat of the least importance if PHMA could not be avoided, and project proponents would have to demonstrate why PHMA could not be avoided
- Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area
- Mitigation barriers, if applicable, would be avoided

All existing fluid mineral uses are explicitly recognized by this alternative and would not be affected by it. The GRSG conservation measures identified in the associated NEPA documents for each of these projects would continue to be implemented to protect GRSG and their habitat. Provisions of this alternative would not be added to the measures identified for each specific project.

GRSG habitat outside PHMA would not be managed to conserve the species because no specific management actions would be provided for this habitat. Similar to Alternative E1, impacts on GRSG from energy development under Alternative E2 would essentially continue as described under Alternative A, although somewhat reduced by the application of BMPs.

The types of impacts on sensitive plants from energy development under Alternative E2 would be the same as described for Alternatives A and B, though their magnitude and spatial distribution would differ. Energy development under Alternative E2 would reduce the impacts of energy development on sensitive plants relative to Alternative A but would not reduce them as much as other alternatives.

Cumulative Effects

Under Alternative E2, some of the current energy development would continue in MZ IV; however, additional measures would conserve existing sagebrush habitat. Therefore, Alternative E2's direct and indirect effects on sensitive plants in GRSG habitat in MZ IV would minimize negative impacts on sensitive plants in PHMA. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase negative impacts on sensitive plants.

Recreation

Direct and Indirect Effects

Alternative E2 would limit or reduce impacts from recreation by preventing new permanent disturbance, including structures, fences, and buildings, in occupied leks or within 1 mile of an occupied lek, unless it were not visible to the GRSG using the lek. In PHMA, the following measures would be implemented

- Disturbance would be avoided, if possible, or minimized by locating development in habitat of the least importance if avoidance were not possible, and project proponents would have to demonstrate why avoidance would not be possible
- Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area
- Migration barriers, if applicable, would be avoided

Alternative E2 could be more protective of GRSG and their habitat than any of the other alternatives because measures to reduce impacts would apply to all recreation as opposed to only SUAs or camping.

The types of recreation-related impacts under Alternative E2 would be the same as described above for Alternative A; however, measures incorporated under Alternative E2 would reduce the level of impacts relative to Alternative A and all other alternatives.

Cumulative Effects

Under Alternative E2, some of the current recreation management direction would continue in MZ IV; however, additional measures would increase protection of GRSG habitat and would minimize the negative impacts of recreation on sensitive plants that occur in those areas. As a result, recreation management in MZ IV under Alternative E2, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plant species.

Determination

Under Alternative E2, proposed conservation measures would limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species would be possible. Therefore, Alternative E2 of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Alternative F

<u>Infrastructure</u>

Direct and Indirect Effects

Alternative F would be similar to Alternative B with regard to infrastructure. Alternative F would treat PHMA as an exclusion area for new ROWs, with some exceptions. In existing ROWs, new ROWs could be authorized if the entire footprint of the proposed project could be contained in the disturbance associated with the existing ROW. If existing roads could not be

used to access current rights that are not yet developed, new road construction would be permitted if the associated disturbance, combined with the total disturbance in the PHMA, did not exceed 3 percent. Like Alternative B, Alternative F would promote undergrounding utility lines in PHMA.

Under Alternative F, infrastructure-related impacts on sensitive plant species could include direct mortality, habitat loss or degradation, and pollinator loss or reduction. The extent of these impacts would be less overall than under Alternative A and similar to that under Alternative B. Such impacts would be avoided or minimized because infrastructure projects would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied for sensitive plants. Under Alternative F, sensitive plants in PHMA would likely experience a net benefit and sensitive plants outside PHMA would likely experience little change in direct or indirect effects.

Cumulative Effects

The cumulative effects of infrastructure management actions under Alternative F when combined with the past, present, and reasonably foreseeable future actions, would be similar to those described for Alternative B and would not substantially increase negative impacts on sensitive plants in MZ IV. (Please refer to Infrastructure under Alternative B above and Chapter 5 of the FEIS.)

Fire and Fuels

Direct and Indirect Effects

Because fire and fuels management under Alternative F would be essentially the same as under Alternative B, the types of fire and fuels-related impacts of Alternative F on sensitive plants would be the same as those discussed above for Alternative B. Under Alternative F, sensitive plant species requiring mature sagebrush would benefit from fire and fuels activities, and sagebrush species that require early successional sagebrush and those that are fire adapted or fire dependent may experience a reduction in suitable habitat over time.

With its emphasis on minimizing fire in mature sagebrush, Alternative F’s impacts on sensitive plants from suppression would be higher than Alternative A’s. Because reseeding would prioritize use of native seed in GRSG habitat over other areas in years of short seed supplies, sensitive plants in areas outside GRSG habitat could be more susceptible to habitat degradation from wildfire if limited seed availability reduced revegetation success outside GRSG habitat.

Elements of Alternative F that differ from those of Alternative B and that could lead to differences in the extent of direct and indirect beneficial and negative impacts on sensitive plants between the two alternatives are the following:

- Excluding livestock grazing from burned areas in GRSG occupied habitat until woody and herbaceous plants achieve GRSG habitat objectives
- Applying fuels management provisions (including post-fire revegetation and invasive species control) to all occupied habitat rather than limiting them to PHMA

These differences would decrease the negative effects of grazing on sensitive plants in burned areas and would increase the impacts on sensitive plants in treatment areas. As discussed in the previous paragraph, impacts on sensitive plants in treatment areas could be positive or negative, depending on their habitat requirements. Overall, the difference in impacts on sensitive plants between Alternatives B and F would likely be negligible because the differences between fire and fuels management under the two alternatives would be minimal.

Cumulative Effects

The cumulative effects of fire and fuels management actions under Alternative F, when combined with the past, present, and reasonably foreseeable future actions, would be similar to those described for Alternative B and would not substantially increase negative impacts on sensitive plants in MZ IV. (Please refer to Fire and Fuels under Alternative B above and Chapter 5 of the FEIS.)

Invasive Plants

Direct and Indirect Effects

Like Alternative B, Alternative F generally would follow existing direction for invasive species control. However, it would include the following additional measures:

- Monitor and control invasive vegetation in treated, burned, or restored sagebrush steppe
- Restrict activities in GRSG habitat that facilitate the spread of invasive plants
- In GRSG habitat, ensure that soil cover and native herbaceous plants are at their ecological potential to help protect against invasive plants
- Develop and implement methods for prioritizing and restoring sagebrush steppe invaded by nonnative plants

Like Alternative B, vegetation management under Alternative F would prioritize restoration of GRSG habitats, which would provide a long-term benefit to sensitive plants. Under Alternative F, short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, by crushing or herbicide drift). Such impacts would be minimal because project-level environmental review would be done, and appropriate avoidance or minimization measures would be incorporated.

Under Alternative F, native seed would be required for reseeding closed roads, primitive roads, and trails. The use of native seed would be favored in other types of restoration under Alternative F, as it would be under Alternative B. Forest Service policy (FSM 2070.3) restricts the use of

nonnative seed in restoration and prohibits the use of invasive species; thus, the impact of the native seed emphasis for restoration in Alternative F is unlikely to result in a measurable additional benefit to sensitive plant species over Alternatives A or B.

Alternative F's monitoring and invasive species control after fuels treatments and at existing range improvements could benefit sensitive plant species by minimizing habitat degradation from invasive species. Overall, Alternative F would reduce impacts of invasive nonnative plants on sensitive plants relative to Alternative A and may provide a marginal benefit over Alternative B.

Cumulative Effects

Under Alternative F, current invasive species management in MZs IV (refer to Chapter 5 of the FEIS) would continue. The long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Additional measures to conserve existing sagebrush habitat under Alternative F would provide a further net benefit to sensitive plants in GRSG habitat. Therefore, Alternative F's direct and indirect effects of invasive species management to GRSG in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

As with Alternatives A and B, Alternative F does not directly address conifer encroachment. The types of impacts of conifer encroachment on sensitive plants under Alternative F would be the same as those under Alternative A. Although the types of impacts would be the same, the conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts on sensitive plants associated with conifer encroachment relative to Alternative A. These measures could reduce the magnitude of impacts on sensitive plants from conifer encroachment relative to Alternative B.

Cumulative Effects

Under Alternative F, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate conservation measures protective of GRSG habitat. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on sensitive plants. Therefore, Alternative F's direct and indirect effects of conifer encroachment management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

As with Alternative B, Alternative F would incorporate GRSG habitat objectives and management considerations into livestock grazing management, but it would extend those to all

occupied habitat rather than limiting them to PHMA. Actions that would directly or indirectly impact sensitive plants are the following:

- Completing range condition assessments
- Considering grazing methods and systems to reduce impacts on occupied GRSG habitat
- Modifying grazing systems in occupied GRSG habitat to meet seasonal GRSG habitat requirements
- Improving management of riparian areas and wet meadows in occupied GRSG habitat
- Evaluating existing introduced perennial grass seedings in occupied GRSG habitat
- Prohibiting new water developments in occupied GRSG
- Avoiding new structural range improvements in occupied GRSG habitat unless studies show they benefit GRSG
- Incorporating BMPs for West Nile virus
- Removing fences

Additional actions under Alternative F that entail more than extending Alternative B actions to all occupied habitat are as follows:

- Excluding livestock grazing from burned areas until woody and herbaceous plants achieve GRSG habitat objectives
- Closing the entire allotment if burned GRSG habitat could not be fenced from unburned habitat
- Increasing vegetation treatment monitoring

The types of impacts on sensitive plants from livestock grazing management under Alternative F would be the same as under Alternatives A and B. Overall, the level and extent of negative impacts would be reduced under Alternative F. Sensitive plants in occupied GRSG habitat would likely benefit from improving habitat conditions in uplands, riparian areas, meadows, and other wetlands. Almost half of the sensitive plant species in Table 2 occur in riparian areas, meadows, seeps, springs, and other wetland areas, which tend to be used more intensively by livestock than upland areas. Because of these factors and the focus of Alternative F on improving riparian, meadow, and other wetland habitat throughout occupied GRSG habitat, sensitive wetland plant species may benefit from Alternative B more than upland species.

Cumulative Effects

Under Alternative F, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS), and wild horse and burro territories would be managed for appropriate management level. Additional measures to conserve sagebrush habitat under Alternative F would further minimize the potential negative impacts of grazing on sensitive plants in GRSG habitat. Therefore, Alternative F's direct and indirect effects of livestock grazing on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

Alternative F would be similar to Alternative B with regard to energy development. The types of impacts on sensitive plants would be the same as described for Alternatives A and B, though their magnitude and spatial distribution would differ. Actions under Alternative F relevant to the analysis of impacts on sensitive plants are the following:

- Closing PHMA to new fluid mineral leasing, with possible exceptions
- Allowing geophysical operations to obtain information about areas only outside and next to PHMA
- Requiring exploratory operations in PHMA to be done using helicopter-portable drilling methods and in accordance with seasonal timing restrictions and other applicable restrictions
- Prohibiting new surface occupancy on federal leases in PHMA
- Applying NSO buffers around leks for existing leases entirely in PHMA and if the entire lease falls in this buffer, limiting disturbances in sections to a 3 percent disturbance threshold
- Applying BMPs to limit the impact of operations
- Applying BMPs to improve reclamation standards and successfully restore PHMA

All of these actions would be likely to reduce the level of impacts of fluid mineral development on sensitive plants relative to Alternative A.

Unlike Alternative B, Alternative F directly addresses wind energy development by prohibiting it in PHMA and requiring it to be sited at least 5 miles from active GRSG leks. This could reduce negative impacts associated with wind energy development on sensitive plants that occur in PHMA relative to Alternatives A and B.

Cumulative Effects

Under Alternative F, measures to conserve occupied sagebrush habitat would be applied to energy development in MZ IV, which would provide an overall benefit to sensitive plant species that occur there. As a result, Alternative F's direct and indirect effects of energy development on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants (refer to Chapter 5 of the FEIS).

Recreation

Direct and Indirect Effects

Alternative F would take a similar approach to recreation management as Alternative B. In PHMA, Alternative F would allow recreation SUAs that were neutral or beneficial to GRSG, limit opportunities for road construction, apply minimum standards to roads, and limit the upgrading of existing roads. In addition, Alternative F would seasonally close camping and other nonmotorized recreation within 4 miles of active GRSG leks. Although the types of impacts on sensitive plants would be similar under Alternatives A, B, and F, the degree and extent of impacts would be reduced under Alternatives F and B relative to Alternative A. The types of impacts that would decrease are direct mortality from crushing or trampling individuals, negative

impacts from dust generation, habitat degradation from soil compaction and changes in hydrology, and negative impacts for the spread of invasive nonnative species.

Cumulative Effects

Management actions associated with recreation under Alternative F would increase conservation of GRSG habitat in MZ IV in PHMA and, in some instances, GHMA and PHMA, and would minimize the negative impacts of recreation on sensitive plants in those areas. As a result, Alternative F's direct and indirect effects of recreation on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants (refer to Chapter 5 of the FEIS).

Determination

Under Alternative F, proposed conservation measures would limit some, but not all, impacts to sensitive plant species and impacts to potentially suitable habitat for these species would be possible. Therefore, Alternative F of the Idaho and Southwestern Montana Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement may impact individuals or habitat, but will not likely contribute to a trend towards federal listing of cause a loss of viability to the population or species for each of the sensitive plant species listed in table 3.

Proposed Plan

Infrastructure

Direct and Indirect Effects

Although the types of infrastructure-related impacts on sensitive plants under the Proposed Plan would be similar to those discussed above for Alternative A, the Proposed Plan would include actions that could change the extent of those impacts and their distribution across the landscape. This analysis focuses on elements of the Proposed Plan that would be most relevant to impacts on sensitive plants.

In PHMA and SFA, the Proposed Plan would restrict issuance of new lands SUAs for infrastructure, such as high-voltage transmission lines, major pipelines, hydropower, distribution lines, and cellular towers. Exceptions must be limited and based on rationale (e.g., monitoring, modeling, or best available science) that explicitly demonstrates that adverse impacts on GRSG would be avoided by the exception. In PHMA and SFA, new solar and wind utility-scale and commercial energy development would be prohibited, except for on-site power generation associated with existing industrial infrastructure. In IHMA, new wind energy utility-scale and commercial development should be restricted.

In all GRSG habitat management areas and SFA, new infrastructure (e.g., high-voltage transmission lines, major pipelines, roads, distribution lines, and cellular towers) would be collocated with existing infrastructure to limit disturbance to the smallest footprint, or where it best limits impacts on GRSG or their habitats. When this is not possible, new infrastructure would be located next to existing infrastructure, roads, or already disturbed areas.

In PHMA and SFA outside of designated corridors, new transmission lines and pipelines would

be buried to limit disturbance to the smallest footprint, unless explicit rationale is provided that the biological impacts on GRSG and its habitat are being avoided. These conservation measures would reduce the level of negative impacts from infrastructure relative to Alternative A and may provide some additional reduction in impacts over Alternative B.

Some infrastructure-related elements of the Proposed Plan could increase negative impacts on sensitive plants relative to Alternatives A and B. The Proposed Plan would require new power and communication lines in PHMA and SFA outside existing ROWs to be buried where physically feasible. Burying utilities could impact sensitive plant species through direct mortality or degradation of habitat. In comparison with Alternative D, which would require new power and communication lines to be buried in PHMA, IHMA, and GHMA outside existing ROWs, a smaller area could be subject to utilities burying under the Proposed Plan. Because power lines could be buried in a larger area than under Alternative B, which focuses only on PHMA, more sensitive plant species or their occurrences could be impacted. However, such impacts would be minimized or avoided because the burial of power lines would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied for sensitive plants.

Cumulative Effects

Under the Proposed Plan, management actions associated with infrastructure in MZ IV would increase protection of GRSG habitat (refer to Chapter 5 of the FEIS) and would likely provide an overall benefit to sensitive plants that occur in in it. Therefore, the Proposed Plan's direct and indirect effects of lands and realty management on sensitive plants in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Fire and Fuels

Direct and Indirect Effects

As with Alternatives B and D, the Proposed Plan would prioritize fire suppression and restoration in sagebrush areas using native plants. Similar to Alternative D, the Proposed Plan would include the following:

- Planning
- Positioning firefighting resources locally
- Training firefighters to prepare for fire outbreaks
- Using fuels reduction and green strips to strategically reduce fire effects in PHMA, IHMA, and GHMA

In addition, the Proposed Plan would include SFA in these measures. The types of impacts on sensitive plants associated with fire and fuels would be similar to those discussed under Alternative A, but their extent and distribution across the landscape would differ. Efforts to exclude fire from GRSG habitats would have impacts on sensitive plants similar to those discussed under Alternative D. However, measures that expand sagebrush habitat conservation to SFA could provide an additional benefit to sensitive plants in those areas and require mature sagebrush habitat.

Cumulative Effects

Under the Proposed Plan, management actions for fire and fuels would increase protection of all GRSG habitats. Though such management could result in some negative impacts on sensitive plants, overall their effects would be neutral or beneficial. Therefore, the Proposed Plan's direct and indirect effects of fire and fuels management on GRSG habitat in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Invasive Plants

Direct and Indirect Effects

Under the Proposed Plan, invasive nonnative plant control would follow current direction, and the types of direct and indirect impacts on sensitive plants would be the same as those discussed under Alternative A. As with Alternative B, vegetation management conservation measures under the Proposed Plan would prioritize restoration, including treatment of invasive nonnative plants in GRSG habitats. This would provide a long-term benefit to sensitive plants in those habitats.

Applicable to all GRSG habitat management areas and SFA, the Proposed Plan contains specific guidelines to incorporate appropriate invasive annual grass management during the design of GRSG habitat restoration projects and road and roadway maintenance activities. For example, all firefighting vehicles and equipment would be washed before being driven on or off these areas. As a result, sensitive plants in and next to these areas could experience a long-term benefit by reducing the effects of invasive plants.

Under the Proposed Plan, short-term impacts of invasive plant treatments and other restoration actions, particularly those that involve mechanized equipment or herbicides, could negatively impact individual sensitive plants (for example, by crushing or herbicide drift). Such impacts would be minimal because project-level environmental review would be done and appropriate avoidance or minimization measures would be incorporated.

The use of native seed would be favored in restoration under the Proposed Plan, as it would be under Alternatives B and D. Forest Service policy (FSM 2070.3) restricts the use of nonnative seed in restoration and prohibits the use of invasive species; therefore, the impact of the native seed emphasis for restoration under the Proposed Plan is unlikely to result in a measurable added benefit to sensitive plant species over Alternatives A, B, or D. However, the Proposed Plan guidelines concerning invasive plants also pertains to SFA, and the positive and negative effects on sensitive plant species may occur in a larger area. Therefore, the Proposed Plan would likely reduce impacts of invasive plants on sensitive plants in a larger area, compared to all the other alternatives.

Cumulative Effects

Under the Proposed Plan, current invasive species management would continue, and the long-term beneficial impacts of improved habitat conditions would continue to outweigh the short-term negative impacts of these activities on sensitive plants. Additional measures to conserve sagebrush habitat and restore degraded sagebrush habitat under the Proposed Plan would provide

a further net benefit to sensitive plants in all GRSG habitat management areas and SFA. Therefore, the Proposed Plan's direct and indirect effects of invasive species management to GRSG in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Conifer Encroachment

Direct and Indirect Effects

Similar to Alternative D, the Proposed Plan would address conifer encroachment more directly than Alternatives A, B, or C by emphasizing vegetation rehabilitation that reduces conifer encroachment into important GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in all GRSG habitat management areas, including SFA. The types of impacts on sensitive plants from conifer encroachment and associated management actions under the Proposed Plan would be the same as those described under Alternative A.

The Proposed Plan would likely reduce the magnitude of the negative impacts on sensitive plants from conifer encroachment relative to Alternative A. Negative impacts of encroachment removal projects would be minimized or avoided because they would undergo site-specific environmental review, including NEPA, and conservation measures or design features would be applied for sensitive plants. Because Alternative D and the Proposed Plan would take a more direct approach at managing conifer encroachment, the overall beneficial effects of these actions would be increased relative to Alternatives A, B, and C.

Cumulative Effects

Under the Proposed Plan, current management of conifer encroachment in MZ IV (refer to Chapter 5 of the FEIS) would continue, though the alternative also would incorporate GRSG habitat conservation measures that directly address conifer encroachment. Management of conifer encroachment and associated conservation measures would have an overall neutral or beneficial effect on sensitive plants. Therefore, the Proposed Plan's direct and indirect effects of conifer encroachment management on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Livestock Grazing

Direct and Indirect Effects

The Proposed Plan contains a standard that specifically prohibits construction of water developments in PHMA, IHMA, and SFA, unless it would be beneficial to GRSG habitat. Other measures for livestock grazing in the Proposed Plan are similar to Alternative D. This includes managing for vegetation composition (including riparian and lentic areas) and structure, which would be consistent with appropriate GRSG seasonal habitat objectives, relative to site potential.

Both Alternative D and the Proposed Plan would consider retiring grazing in all GRSG habitats if grazing privileges were relinquished or an allotment became vacant, but the Proposed Plan extends this measure to include SFA. The Proposed Plan also focuses restrictions of camps,

sheep bedding, livestock trailing, fence construction, and other new permanent livestock facilities on areas near active GRSG leks. Although the types of impacts on sensitive plants would be the same as under Alternative A, the level and extent of negative impacts would likely be reduced under the Proposed Plan.

Sensitive plants that occur in GRSG habitats would likely benefit from improving habitat conditions in uplands, riparian areas, meadows, and other wetlands. Almost half of the sensitive plant species in Table 2 occur in riparian areas, meadows, seeps, springs, and other wetland areas, which livestock tend to use more intensively than upland areas. Because of these factors and the inclusion of measures to improve riparian, meadow, and other wetland habitat, sensitive wetland plant species may benefit from the Proposed Plan more than upland species. Relative to other alternatives, the Proposed Plan would provide greater benefit to sensitive plants than Alternatives A, B, and D; however, the greatest overall benefit with regard to livestock grazing would be realized from Alternative C because it would remove livestock grazing from GRSG habitats.

Cumulative Effects

Under the Proposed Plan, livestock grazing would continue to be managed through existing grazing plans in MZ IV (refer to Chapter 5 of the FEIS). Additional measures to conserve existing sagebrush habitat under the Proposed Plan would further minimize negative impacts on sensitive plants that may occur in GRSG habitat. Therefore, the Proposed Plan's direct and indirect effects of livestock grazing on sensitive plants in MZ IV, when combined with past, present, and reasonably foreseeable future actions, would not substantially increase negative impacts on sensitive plants.

Energy Development

Direct and Indirect Effects

The types of impacts on sensitive plants from energy development under the Proposed Plan would be the same as described above for Alternatives A and B, though their magnitude and spatial distribution would differ. As with Alternative D, the Proposed Plan would conserve GRSG habitat. Similar to Alternative D, actions that are particularly relevant to the analysis of impacts on sensitive plants are closing most PHMA and IHMA to future fluid mineral leasing and developing and placing additional stipulations and seasonal restrictions on existing fluid mineral leases in all GRSG habitats to minimize potential impacts. However, the Proposed Plan would additionally require an NSO stipulation for any new oil and gas leases in PHMA, IHMA, and SFA. Most other minerals restrictions would also apply to SFA. For the Proposed Plan, the 3 percent disturbance cap would be calculated in the Biologically Significant Unit instead of in each section. These actions would be likely to reduce the impacts of fluid mineral development on sensitive plants, relative to Alternative A and to a level even less than Alternative D.

Unlike Alternative B, the Proposed Plan would directly address solar and wind energy development; similar to Alternative D, the Proposed Plan would prohibit new wind and solar energy development in PHMA. Unlike Alternative D, the Proposed Plan would extend this prohibition and most other restrictions to SFA as well. Alternative D and the Proposed Plan would make IHMA avoidance areas and would allow GHMA to remain open for wind and solar

energy development in Idaho; however, only the Proposed Plan would make GHMA avoidance areas for wind and solar energy development in Montana. The Proposed plan would be likely to reduce negative impacts of energy development on sensitive plants that occur in GRSG habitats relative to Alternatives A, B, and D.

Cumulative Effects

Under the Proposed Plan, some of the current energy development would continue in MZ IV; however, additional measures would conserve existing sagebrush habitat and provide an overall long-term benefit to the sensitive plant species that occur there. Therefore, the Proposed Plan's direct and indirect effects on sensitive plants in GRSG habitat in MZ IV would minimize negative impacts on sensitive plants in GRSG habitat. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase negative impacts on sensitive plants.

Recreation

Direct and Indirect Effects

The Proposed Plan would apply measures to reduce the potential negative impacts of recreation on GRSG. Similar to Alternative D, in all GRSG habitats, terms and conditions in new and existing permits and operating plans should be included to protect or restore GRSG habitat; however, the Proposed Plan extends these measures to include SFA. In PHMA, IHMA, and SFA, the Proposed Plan also would not authorize temporary recreation uses that would result in loss of habitat or that would have greater than 5 years of negative impacts on GRSG or their habitats. Moreover, the Proposed Plan would not approve new or expanded recreation facilities (e.g., roads, trails, and campgrounds), including SUAs for facilities and activities. This would be the case unless the development would result in a net conservation gain to GRSG or their habitats or if the development were required for visitor safety. The Proposed Plan measures would reduce the general impacts of recreation on GRSG that were described under Alternative A. Although the types of impacts on sensitive plants would be similar to Alternatives A, B, and D, the extent of impacts in GRSG habitat would be lower under the Proposed Plan due to its greater extent of restrictions by delineating SFA.

Cumulative Effects

Management actions associated with recreation under the Proposed Plan would increase protection of PHMA, IHMA, GHMA, and SFA in MZ IV and would minimize the negative impacts of recreation on sensitive plants in those areas. Therefore, when combined with the past, present, and reasonably foreseeable future actions, recreation management in MZ IV under the Proposed Plan would not substantially increase negative impacts on sensitive plant species.

Summary and Determination of Effects on Sensitive Plant Species

The Proposed Plan includes measures to reduce impacts on GRSG habitat from activities in all major program areas of the current Forest Service LUPs in the analysis area. The restrictions and considerations for the benefit of GRSG habitat would also result in improved sensitive plant habitat conditions and would reduce the potential for negative impacts on sensitive plant individuals. Some negative effects would continue, but the overall result would benefit sensitive

plants and their habitats. Therefore, the GRSG LUPA for the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Challis, Salmon, and Sawtooth National Forest Plans and the Curlew National Grassland Plan **may impact individuals or habitat, but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species** for the 44 Region 1 and Region 4 sensitive plant species in Table 2.

The PHMA of the Table 2 species do not exist in GRSG habitat or are outside the elevation range of the GRSG. Because of this, the GRSG LUPA for the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Challis, Salmon, and Sawtooth National Forest Plans and the Curlew National Grassland Plan would have **no impact on** the 33 Region 1 and Region 4 sensitive plant species excluded from detailed analysis in Table 1.

The Proposed Plan would not cause a trend toward federal listing or a loss of viability to any of the 77 sensitive plant species considered in this analysis. Because of this, the determinations above are consistent with sensitive plant direction in each of the Beaverhead-Deerlodge, Boise, Caribou-Targhee, Challis, Salmon, and Sawtooth National Forest Plans and the Curlew National Grassland Plan.

II. RECOMMENED CONSERVATION MEASURES TO AVOID, MINIMIZE, OR MITIGATE ADVERSE EFFECTS

No additional conservation measures have been identified at this time.

Management Indicator Species Analysis

I. INTRODUCTION

Management Indicator Species Analysis

The National Forest Management Act directs National Forests to identify MIS based on five criteria (36 CFR 219.19 (a)(1)) including endangered and threatened plant and animal species identified on State and Federal lists; species commonly hunted, fished, or trapped; non-game species of special interest; species with special habitat needs that may be influenced significantly by planned management programs; additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality. MIS are often selected because they are sensitive to habitat changes. By monitoring and assessing populations of MIS, managers examine the outcome of implementing land management plans. MIS for the various Forest Land and Resource Management Plans in the Idaho and Montana GRSG EIS analysis area are listed in Table 4). There are no plant MIS in the analysis area.

Table 4. MIS on National Forest Lands in the Idaho-Montana GRSG Analysis Area

Common Name	Scientific Name	Forest/Grassland (Region)
Canada lynx	*Lynx canadensis*	Targhee[7] (4)
Grizzly bear	*Ursus arctos horribilis*	Targhee (4)
North American wolverine	*Gulo luscus*	Beaverhead-Deerlodge (1), Targhee (4)
Fisher	*Martes pennanti*	Targhee (4)
Gray wolf	*Canis lupus*	Targhee (4)
American marten	*Martes americana*	Targhee (4)
Mountain goat	*Oreamnos americanus*	Beaverhead-Deerlodge (1)

[7] Land management plans for the Targhee and Caribou National Forests have not been revised since the two forests were combined as the Caribou-Targhee National Forest. Therefore, MIS species differ between the existing Targhee and Caribou land management plans.

Common Name	Scientific Name	Forest/Grassland (Region)
Red squirrel	*Sciurus vulgaris*	Targhee (4)
Rocky Mountain elk	*Cervus canadensis*	Beaverhead-Deerlodge (1)
Bald eagle	*Haliaeetus leucocephalus*	Targhee (4)
Black-backed woodpecker	*Picoides arcticus*	Targhee (4), Boise (4)
Boreal owl	*Aegolius funereus*	Targhee (4)
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	Caribou (4), Curlew (4)
Common loon	*Gavia immer*	Targhee (4)
Flammulated owl	*Otus flammeolus*	Targhee (4)
Great gray owl	*Strix nebulosa*	Targhee (4)
GRSG	*Centrocercus urophasianus*	Curlew (4), Caribou (4), Salmon-Challis (4), Sawtooth (4)
Harlequin duck	*Histrionicus*	Targhee (4)
Northern goshawk	*Accipiter gentilis*	Caribou (4), Sawtooth (4), Targhee (4)
Peregrine falcon	*Falco peregrinus anatum*	Targhee (4)
Three-toed woodpecker	*Picoides tridactylus*	Targhee (4)
Trumpeter swan	*Cygnus buccinator*	Targhee (4)
White-headed woodpecker	*Picoides albolarvatus*	Boise (4)
Lewis's woodpecker	*Melanerpes lewis*	Targhee (4)
Downy woodpecker	*Salvelinus fontinalis*	Targhee (4)
Hairy Woodpecker	*Picoides villosus*	Targhee (4)
Northern flicker	*Colaptes auratus*	Targhee (4)

Common Name	Scientific Name	Forest/Grassland (Region)
Pileated woodpecker	*Dryocopus pileatus*	Salmon-Challis (4), Sawtooth (4), Boise (4)
Red-napped sapsucker	*Sphyrapicus nuchalis*	Targhee (4)
Williamson's sapsucker	*Sphyrapicus thyroideus*	Targhee (4)
Columbia spotted frog	*Rana luteiventris*	Salmon-Challis (4), Targhee (4)
Bull trout	*Salvelinus confluentus*	Salmon-Challis (4), Sawtooth (4), Boise (4)
Yellowstone cutthroat trout	*Oncorhynchus clarkii bouveri*	Sawtooth (4)
Mayfly	*Drunella doddsi*	Beaverhead-Deerlodge (1)
Elk Vulnerability, Habitat Effectiveness and elk and deer winter range	N/A	Targhee (4)
Riparian breeding birds	N/A	Curlew (4)

The 1982 (36 CFR, Part 219.19) regulations for viability state that the Forest Service has the responsibility to provide sufficient habitat that can support viable populations of native and desired nonnative vertebrates across the planning area at a level that populations are likely to persist on National Forest System lands.

On December 18, 2009, the Department of Agriculture issued a final rule reinstating the National Forest System Land and Resource Management Planning Rule of November 9, 2000, as amended (2000 Rule; 74 FR 242 [67059-67075]). This rescinded the 1982 planning rule. The 2000 Rule states that "Projects implementing land management plans must comply with the transition provisions of 36 CFR §219.35, but not any other provisions of the planning rule. Projects implementing land management plans and plan amendments, as appropriate, must be developed considering the best available science in accordance with §219.35(a). Projects implementing land management plans must be consistent with the provisions of the governing plans."

The following approach was used to address the MIS species and the issues surrounding the change in planning rules and to ensure the best available science was used:

- Identify habitat and population characteristics/trends by forest
- Identify the role of the habitat on each forest in the overall viability of the population
- Analyze the effects of each alternative, based on relevant threats and current and past management
- Determine if the effects of the alternatives will affect the ability of the species to persist in the planning unit

Table 5. Rationale for Including or Dismissing MIS in the Idaho-Montana GRSG Analysis Area

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Canada lynx		N	N	Uses montane and subalpine coniferous forests. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of Canada lynx or its habitat, so it was not evaluated in more detail.
Grizzly bear		N	N	Bears require a very large home range, encompassing diverse forests, interspersed with moist meadows and grasslands in or near mountains. In the spring, bears usually range at lower elevations and go to higher altitudes for winter hibernation. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of grizzly bear or its habitat, so it was not evaluated in more detail.
North American wolverine	Effects of disturbance on high elevation winter range and denning habitat	N	N	Uses remote habitats in subalpine and montane forests. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of North American wolverine or its habitat, so it was not evaluated in more detail.
Fisher		N	N	Uses forested stands with high canopy cover and riparian corridors. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of fisher or its habitat, so it was not evaluated in more detail.
Gray wolf		Y	Y	Habitat generalist occurring in parts of Idaho characterized by a mosaic of dry and mesic conifer and subalpine forest, as well as grassland and shrubland that support big-game (elk, moose, and deer) populations. Although this species may occasionally use PHMA or GHMA, it has shown no affiliation or dependence on these habitats. The alternatives would cause no changes to populations of gray wolf or its habitat, so it was not evaluated in more detail.
American marten		N	N	Uses mature and old-growth spruce-fir and lodgepole forests. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of American marten or its habitat, so it was not evaluated in more detail.

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Mountain goat	Effects of disturbance on high elevation winter range and denning habitat	N	N	Uses cliffy terrain, south-facing canyon walls, windblown ridgetops, ravines, forests, and subalpine forests. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of mountain goat or its habitat, so it was not evaluated in more detail.
Red Squirrel		N	N	Requires conifer forests of cone-bearing age. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of red squirrel or its habitat, so it was not evaluated in more detail.
Rocky Mountain elk	Important commonly hunted species	Y	Y	Habitat generalist, but mainly uses coniferous forests interspersed with natural or man-made openings; sagebrush-grasslands provide winter range forage. The alternatives propose some changes to management of sagebrush habitats, so populations could respond to proposed changes according to each of the alternatives and it was evaluated in additional detail.
Bald eagle		Y	N	Nests in large trees (conifers or cottonwoods) near large rivers or water bodies and prefers fish for prey. Although bald eagles may occasionally use PHMA or GHMA, it has shown no affiliation or dependence on these habitats. It would not be affected by any of the actions in a measurable amount. The alternatives would cause no changes to populations of bald eagle or its habitat, so it was not evaluated in more detail.
Black-backed woodpecker	High numbers of snags in disturbed forests, use of late-seral old forest conditions, and relationship with beetle outbreaks in the years immediately following fire or insect or disease outbreaks (Boise)	N	N	Uses forested areas with abundant wood-boring insects, resulting from fires or high-density, and unburned old forest with high levels of snags and logs. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of black-backed woodpecker or its habitat, so it was not evaluated in more detail.

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Boreal owl		N	N	In Idaho, uses high-elevation spruce-fir, mixed conifer, and aspen forests. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of boreal owl or its habitat, so it was not evaluated in more detail.
Columbian sharp-tailed grouse	Grasslands and open canopy sagebrush habitats	Y	Y	The alternatives propose some changes to managing sagebrush habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this species was evaluated in additional detail.
Common loon		N	N	Nests in extreme eastern Idaho in shallow natural lakes (5,000 to 9,000 feet). No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of common loon or its habitat, so it was not evaluated in more detail.
Flammulated owl		N	N	In Idaho, uses mid-elevation, old growth, or mature stands of open ponderosa pine and Douglas-fir or stands dominated by both species. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of flammulated owl or its habitat, so it was not evaluated in more detail.
Great gray owl		N	N	Uses mature forest and large-diameter trees or snags. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of great gray owl or its habitat, so it was not evaluated in more detail.
GRSG	Sagebrush habitats (Curlew, Caribou and Salmon-Challis); habitat reduction, connectivity, and degradation in sagebrush/ grassland habitats (Sawtooth)	Y	Y	The alternatives propose some changes sagebrush habitat management, so populations could respond to proposed changes according to each of the alternatives. Therefore, this species was evaluated in additional detail.
Harlequin duck		N	N	Breeds near swiftly flowing, clear, forested or well-vegetated, undisturbed mountain streams. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of harlequin duck or its habitat, so it was not evaluated in more detail.

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Northern goshawk	Mature and old forest habitat (Caribou); broad-elevation old-forest habitats (Sawtooth)	N	N	Uses a variety of forest ages, structural conditions, and successional stages. No primary habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of northern goshawk or its habitat, so it was not evaluated in more detail.
Peregrine falcon		Y	Y	Nests on cliffs with a wide view, low disturbance, and abundance of prey; all forest vegetation types within 10 miles of suitable cliffs. Although this species may occasionally use PHMA or GHMA, no affiliation or dependence on these habitats has been shown. It would not be affected by any of the actions in a measurable amount. The alternatives would cause no changes to populations of peregrine falcon or its habitat, so it was not evaluated in more detail.
Three-toed woodpecker		N	N	Uses mature forested stands. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of three-toed woodpecker or its habitat, so it was not evaluated in more detail.
Trumpeter swan		N	N	Uses lakes and ponds and adjacent marshes. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of trumpeter swan or its habitat, so it was not evaluated in more detail.
White-headed woodpecker	Source habitats tied to large trees, open canopy conditions, large snags, and old-forest habitat in low-elevation forests dominated by ponderosa pine that developed under nonlethal and mixed fire regimes	N	N	In Idaho, uses open and mature ponderosa pine and mixed ponderosa pine/Douglas-fir forests with large-diameter snags. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of white-headed woodpecker or its habitat, so it was not evaluated in more detail.

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Lewis's woodpecker		N	N	Uses open ponderosa pine forest, open riparian woodlands dominated by cottonwood, and burned pine forests. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of Lewis's woodpecker or its habitat, so it was not evaluated in more detail.
Downy woodpecker		N	N	Uses forested environment with suitable snags or live trees for nesting. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of downy woodpecker or its habitat, so it was not evaluated in more detail.
Hairy woodpecker		N	N	Uses forested environment with suitable snags or live trees for nesting. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of hairy woodpecker or its habitat, so it was not evaluated in more detail.
Northern flicker		Y	N	Although this species may occasionally use PHMA or GHMA, its primary limiting factor, suitable tree cavities for nesting, would not be affected by any of the actions in a measurable amount. The alternatives would cause no changes to populations of northern flicker or its habitat, so it was not evaluated in more detail.
Pileated woodpecker	Coniferous habitat/community type (Salmon-Challis); sufficient large trees, snags, and coarse woody debris in old conifer forests (Sawtooth); snag and old forest habitats (Boise)	N	N	Uses multilayer, late-seral stages of broad-elevation old forest. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of pileated woodpecker or its habitat, so it was not evaluated in more detail.
Red-naped sapsucker		N	N	Uses forested environment with suitable snags or live trees for nesting. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of red-naped sapsucker or its habitat, so it was not evaluated in more detail.

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Williamson's sapsucker		N	N	Uses forested environment with suitable snags or live trees for nesting. No habitat in mapped PHMA or GHMA. The alternatives would cause no changes to populations of Williamson's sapsucker or its habitat, so it was not evaluated in more detail.
Columbia spotted frog	Riparian habitat/community type (Salmon-Challis)	Y	Y	Uses permanent water (marshy edges of ponds or lakes, in algae-grown overflow pools of streams) or wet areas with emergent vegetation; may move considerable distances (mixed conifer and subalpine forests, grasslands, and shrubland) from permanent water during rainy periods after breeding. There are records of the species in PHMA and GHMA. None of the alternatives is expected to impact any of the identified limiting factors for Columbia spotted frog or its life requirements. Based on these factors, it was not analyzed in additional detail.
Bull trout	Aquatic habitat/community type (Salmon-Challis and Sawtooth)			Relatively pristine stream and lake habitats in western North America. The Salmon-Challis National Forest is in two bull trout recovery units: the Salmon River, in which most of the Salmon-Challis National Forest occurs, and the Little Lost, which includes the Lost River Ranger District. May overlap PHMA or GHMA in a few migration corridors on the South Fork of the Boise River on the Boise National Forest. Only slightly overlaps PHMA or GHMA in the Upper Salmon sub-basin of the Sawtooth National Forest. None of the alternatives is expected to impact any of the identified limiting factors for bull trout or its life requirements. Based on these factors, this species was not analyzed in additional detail.
Yellowstone cutthroat trout	The effects of authorized and unauthorized activities on watershed, riparian, and stream habitat conditions	Y	Y	Uses clear, cold streams, rivers, and lakes. There are records of the species in PHMA/GHMA. None of the alternatives is expected to impact any of the identified limiting factors for Yellowstone cutthroat trout or its life requirements. Based on these factors, the Yellowstone cutthroat trout was not analyzed in additional detail.

Common Name of MIS	Management Issue	Species Present in Analysis Area?	Habitat Present in Analysis Area?	Rationale for Inclusion or Dismissal
Mayfly	Aquatic species; changes in the aquatic environment from management activities	Y	Y	Fairly common in the fast-flowing riffle areas of small cobble streams to larger trout rivers throughout Montana. Although streams and rivers in PHMA and GHMA may contain this species, none of the alternatives is expected to impact any of its identified limiting factors or life requirements. Based on these factors, this species will not be analyzed in additional detail.
Elk vulnerability, habitat effective-ness, and deer and elk winter range		N	N	Applies to areas of the Targhee National Forest with suitable elk hiding cover. Does not include open, vast sagebrush plain and, therefore, does not apply to mapped PHMA or GHMA habitat. Implementation of the alternatives will cause no changes to elk vulnerability and habitat effectiveness. Therefore, elk vulnerability and habitat effectiveness will not be evaluated in additional detail.
Riparian breeding birds	Riparian habitats	Y	Y	The alternatives propose some changes to management of sagebrush habitats that contain riparian habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this species group will be evaluated in additional detail.

VI. SPECIES INFORMATION AND EFFECTS ANALYSIS (DIRECT, INDIRECT, AND CUMULATIVE)

A. GRSG (*Centrocercus urophasianus*)

A complete analysis of the GRSG appears in the biological evaluation section of this document.

B. Columbian sharp-tailed grouse (*Tympanuchus phasianellus*)

Distribution R4 Sensitive—Boise National Forest, Caribou National Forest, Sawtooth National Forest, Targhee National Forest

The Columbian sharp-tailed grouse occurs in southwestern Canada, Washington, Oregon, Idaho, Montana, and Wyoming. It is not known if this bird nests in the Boise National Forest, but it is assumed that some do. Idaho Department of Fish and Game records show one sharp-tailed grouse record for the Boise National Forest (Nutt et al. 2010).

Most of the Caribou-Targhee National Forest is at a higher elevation than this species is typically found. While there are numerous leks next to the Caribou National Forest, none are on Caribou National Forest lands. Sagebrush and grassland habitats in the forest may provide nesting, brood-rearing, and winter habitat. Survey data for attendance on leks next to the Caribou National Forest are very patchy. In the Targhee National Forest, there appears to be habitat for sharp-tailed grouse in the Shotgun Valley, along the western boundary of the Ashton-Island Park District (similar to GRSG), and on the southern portions of the Dubois District east of I-15. Habitat in the forest is likely brood-rearing habitat, as opposed to nesting or wintering habitat.

Columbian sharp-tailed grouse populations occur in three sub-basins in the Sawtooth National Forest: Curlew Valley, Raft River, and Salmon Falls Creek. Sharp-tailed grouse populations are small and isolated, and this species is anticipated to use adjacent BLM-administered and private lands. Forest Service-administered lands are believed to provide important fall and wintering requirements, and these habitats are generally in the mountain shrub communities. It is not known definitively if this species nests on Forest Service-administered lands, but it is assumed that some do.

Habitat Associations and Threats

Sharp-tailed grouse are found in low-elevation native shrub-grasslands year-round. Abundant grass composition appears to be important in shrub/grassland communities during all life stages. Through the summer, it uses the shrubs for cover and the grass and forbs for food, including insects that are available in these habitats. During the winter, the tall shrubs serviceberry, chokecherry, bitterbrush, bitter cherry, hawthorn, and aspen increase in importance for food supply because they are above the snow cover; riparian cover types become a critical habitat

component. These habitats are referred to as mountain shrub communities and shrub-dominated riparian areas and include areas with moderate to high canopy cover.

Much of the sharp-tailed grouse's low-elevation historical habitat has been converted to agriculture. Another concern has been the extensive modification of some of these communities due to wildfire.

Population, Status, Abundance, and Trend

The Columbian sharp-tailed grouse has a global status ranking of G4T3 (vulnerable—at moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors) and a state (Idaho) ranking of S1 (critically impaired—At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors; NatureServe 2015).

Caribou National Forest and Curlew National Grassland MIS Monitoring

The Columbian sharp-tailed grouse is a Caribou National Forest MIS species representing grasslands and open canopy sagebrush habitats. In 1995, the sharp-tailed grouse was petitioned for listing under the Endangered Species Act. In October 2000, the USFWS found that the grouse was not warranted for listing. The review showed that while smaller, isolated populations may be at risk, there are numerous larger populations that are relatively secure and possibly increasing. The species has undergone significant range-wide decline and now occupies less than 10 percent of its former range. However, Idaho has the best remaining populations, with 75 percent of the remaining birds (Paige and Ritter 1999). In southeastern Idaho, the largest concentrations of sharp-tailed grouse are in Fremont, Bonneville, and Oneida Counties. Birds from around the Curlew Grasslands have been transplanted into other areas of Idaho and out of state.

Survey data for attendance on leks next to the Caribou National Forest are very patchy. For example, in 1986, 2 leks were surveyed, in 1992 17 leks were surveyed, and in 1998 7 leks were monitored. There are or have been 49 leks known in 2 miles of the Caribou National Forest, but none have long-term data, so it is not known how many of these are currently active. Because of the very limited data, the population trends in the vicinity of the Caribou are not discussed in this document. However, as mentioned previously, populations in southeastern Idaho are being used to transplant into other areas of Idaho and other states. Survey data for attendance on leks on the Curlew National Grassland is more consistent. Leks have generally been monitored for activity over the past 15-plus years. Two doctoral research projects and one Master's research project have taken place in the Curlew Valley over the past 15 years, and extensive lek surveys have been conducted on the National Grassland over the last three years (Colt 2011). There are currently 31 sharp-tailed grouse leks known in the Caribou National Forest, and trends have been stable to increasing.

Alternative A

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for infrastructure under Alternative A. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

The baseline date is 2012 for the cumulative impacts analysis for Columbian sharp-tailed grouse. The temporal scope of this analysis is a 20-year planning horizon; land use planning documents are generally evaluated on a 5-year cycle. The temporal boundary for cumulative effects analysis for sharp-tailed grouse is the WAFWA MZ IV (Snake River Plain) for GRSG. This is because all of the Idaho/Montana planning area, with the exception of a small portion of private lands in MZ II in the southeastern corner of Idaho, is in MZ IV and sharp-tailed grouse, as with GRSG, are a sagebrush-dependent species.

Current infrastructure management activities would continue under Alternative A. ROW exclusion or avoidance areas would not be instituted as they would be under Alternatives B, C, D, E1, E2, or F. Therefore, under Alternative A, the direct and indirect effects of infrastructure management, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of the sagebrush habitat and disturbance to sharp-tailed grouse in MZ IV (refer to the Cumulative Effects section of the Draft EIS, USDI BLM and USDA Forest Service 2013).

Fire and Fuels—Direct and Indirect Effects

Alternative A would continue to manage wildfire and prescribed burns under current direction. This would have the fewest restrictions for fire and fuels management and a high potential for vegetation disturbance. Artificial fire regimes created by fire suppression and resulting conifer encroachment are major threats to Columbian sharp-tailed grouse. Under Alternative A, its habitat would continue to be constrained in areas where suppression results in higher rates of juniper and forest encroachment.

Prescribed burns could be used in sagebrush habitat where needed to control fuel loading. Policies would not prioritize protection or restoration of mature sagebrush habitat. Increased human activity and noise associated with wildland fire suppression and prescribed fire in areas occupied by Columbian-sharp-tailed grouse could disrupt nesting, breeding, or foraging behavior. IHMA could be removed or degraded because of the use of heavy equipment or hand tools. Other potential impacts may include injuring or killing eggs and chicks, causing changes in species movement patterns due to areas devoid of vegetation, or reducing population viability and increasing the contribution to the need to list the species.

Cumulative Effects

Current wildfire suppression and fuels management would continue under Alternative A. The limitation or prohibition of prescribed fire in sagebrush habitats and the sagebrush protection emphasis during wildland fire operations would not be instituted as they would be under Alternatives B, C, D, E1, E2, and F. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of the sagebrush habitat from wildfire in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for invasive plants under Alternative A. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative A, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), the mechanical, manual, chemical, and biological control of invasive plants would continue. The short-term negative impacts of these activities on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. Therefore, Alternative A's direct and indirect effects of invasive plants management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

As discussed under Fire and Fuels above, Columbian sharp-tailed grouse habitat can be constrained in areas where suppression results in higher rates of juniper and forest encroachment, and encroachment can result in catastrophic wildfire, a key threat to this species. Expansion of conifer woodlands, especially juniper, displaces shrubs, grasses, and forbs through direct competition for resources; juniper expansion is also associated with increased bare ground and increased potential for erosion. Mature trees may offer perch sites for avian predators. Alternative A does not directly address conifer encroachment; however, habitat restoration and vegetation management policies described for Invasive Plants and fuels treatments described under Fire and Fuels would likely also reduce juniper encroachment.

Cumulative Effects

Current conifer encroachment management would continue under Alternative A; the measures addressing conifer encroachment would not be instituted because they would be in several of the action alternatives. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and

fragmentation of the existing sagebrush habitat from conifer encroachment in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Livestock Grazing—Direct and Indirect Effects

Under this alternative, livestock grazing would continue to be managed under current direction. There would be no change in the locations, numbers, timing, or method of livestock grazing in these national forests. Depending on site-specific management, beneficial or adverse impacts of grazing on GRSG or their habitat would continue. Grazing practices can benefit Columbian sharp-tailed grouse by reducing fuel load, protecting intact sagebrush habitat, and increasing habitat extent and continuity. However, grazing at inappropriate intensity, season, or location may alter or degrade sagebrush ecosystems. It could also reduce cover and structure, which could negatively impact lek sites or reduce the suitability of nesting and brood-rearing habitat; this in turn could negatively impact nesting success. Grazing can degrade critical winter riparian habitat. Cattle compete with Columbia sharp-tailed grouse for forbs, occasionally trample birds or nests, and disturb or temporarily displace lekking or nesting birds during movement or trailing operations.

Under current direction, the Forest Service may use a number of mechanisms to reduce the potential for negative impacts from grazing on GRSG. The only planning-level decision available is to decide where areas would be open and closed to livestock grazing. Future impacts would be eliminated in areas closed to grazing, but past impacts would likely persist for some time, and closing grazing may result in other harmful impacts. Other changes in management would occur at the implementation level during the permit renewal process, which occurs every ten years and for which subsequent NEPA analysis would be conducted. At the implementation level, changes in grazing practices or systems can be considered, which could reduce grazing intensity or change the season of use, for example. In addition, changes in grazing management in riparian and wet meadows can reduce impacts in these important seasonal habitats.

Cumulative Effects

Under Alternative A, in MZ IV, livestock grazing would continue to be managed through existing grazing plans, following the plans' methods and guidelines to maintain ecological conditions according to Standards for Rangeland Health. Therefore, Alternative A's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely neutral. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative A. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management under Alternative A would maintain the current acreage open to energy development. Current energy development would continue under Alternative A. Energy development would not be closed as they would be under most of the action alternatives. Therefore, under Alternative A, the direct and indirect effects of energy development in MZ IV, in conjunction with the past, present, and reasonably foreseeable future actions, may result in the increased loss and fragmentation of the sagebrush habitat (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Recreation under Alternative A. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Current recreation management would continue under Alternative A. Recreational disturbances to GRSG would not be limited as they would be under the action alternatives. Under Alternative A, the direct and indirect effects from recreation management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase the loss and fragmentation of sagebrush habitat and disturb sharp-tailed grouse in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Alternative B

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for Infrastructure under Alternative B. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management actions associated with infrastructure under Alternative B would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue, but with the additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative B's direct and indirect effects of infrastructure management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Under Alternative B, suppression would be prioritized in PHMA to protect mature sagebrush habitat. Suppression would be prioritized in GHMA only where fires threaten PHMA. Fire suppression protecting sagebrush habitats would generally benefit Columbian sharp-tailed grouse habitat. The unintended consequence of promoting juniper/conifer succession would be minor to nonexistent.

Fuels treatments would be designed to protect sagebrush ecosystems by maintaining sagebrush cover, implementing fuel breaks, applying seasonal restrictions, and requiring use of native seeds. Post-fuels treatments in PHMA would be designed to ensure long-term persistence of seeded areas and native plants and to maintain 15 percent canopy cover. Fuels treatments in PHMA would also monitor and control invasive species, and fuels management BMPs would incorporate invasive plant prevention measures.

Overall, these conservation measures would reduce the threat of wildfire to sagebrush, compared to Alternative A; however, in general, the effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

Management actions under Alternative B for fire and fuels would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat during suppression and pre-suppression planning and staging for maximum protection of sagebrush habitat. Fuels treatment would focus on protecting sagebrush habitat, primarily in PHMA. Therefore, Alternative B's direct and indirect effects of fire on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative B. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. The short-term negative impacts of these activities on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat, under Alternative B, would provide an added benefit

to sagebrush habitat. Therefore, Alternative B's direct and indirect effects of invasive plants management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Conifer Encroachment—Direct and Indirect Effects

As with Alternative A, Alternative B does not directly address conifer encroachment; however, Alternative B's vegetation conservation measures for Invasive Plants and the fuels treatments previously described in Fire and Fuels would also likely reduce juniper encroachment and its general effects on Columbian sharp-tailed grouse and its habitat.

Cumulative Effects

Under Alternative B, in MZ IV, management measures for invasive plants and fuels treatments that could reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative B's direct and indirect effects of conifer encroachment management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Livestock Grazing—Direct and Indirect Effects

Alternative B would incorporate GRSG habitat objectives and management considerations into livestock grazing management in PHMA. This would benefit the Columbian sharp-tailed grouse and sharp-tailed grouse habitat overlapping PHMA in similar ways. These objectives and considerations are as follows:

- Complete Land Health Assessments
- Consider grazing methods and systems to reduce impacts on GRSG habitat
- Consider retiring vacant allotments
- Improve management of riparian areas and wet meadows
- Evaluate introduced perennial grass seedings
- Authorize new water developments and structural range improvements only when beneficial to GRSG
- Implement BMPs for West Nile Virus
- Remove, modify, or mark fences

Several management actions to reduce impacts from livestock grazing on GRSG GHMA would be incorporated. These include the potential to modify grazing systems to meet seasonal GRSG habitat requirements and management to improve the conditions of riparian areas and wet meadows. Together these efforts would reduce the potential for negative impacts of grazing on Columbian sharp-tailed grouse described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans, but with additional emphasis on protecting sagebrush habitat under Alternative B. Therefore, Alternative B's direct and indirect effects of livestock grazing to sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative B. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management actions associated with energy development under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative B, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative B's direct and indirect effects on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Recreation under Alternative B. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management actions associated with recreation management under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative B, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative B's direct and indirect effects of recreation management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Alternative C

Infrastructure—Direct and Indirect Effects

Alternative C would have the most protective measures for GRSG and, so would be the most protective of sharp-tailed grouse. Alternative C would extend many of Alternative B's conservation measures to all occupied GRSG habitat, and all occupied habitat would be managed as exclusion areas for new ROW projects. As a result, Alternative C would encourage consolidating GRSG habitats, facilitating habitat conservation and management, and reducing the impacts of infrastructure on sharp-tailed grouse. Alternative C's impacts are similar to that described for GRSG in the Infrastructure sections of Alternatives A and B; however, Alternative C's impacts would affect a wider area than Alternative B.

Alternative B would permit wind energy siting in PHMA, provided a development disturbance threshold of 3 percent were not exceeded. However, Alternative C would not permit wind energy development in any occupied GRSG habitat. This would reduce the effects of wind energy development on sharp-tailed grouse, which are similar to those discussed under Alternative A for GRSG, more so than Alternative B.

Cumulative Effects

Management actions associated with infrastructure management under Alternative C would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013) some of the current infrastructure management would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative C's direct and indirect effects of infrastructure management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Alternative C is similar to Alternative B except that it is more protective of sharp-tailed grouse and its habitat. This is because prioritizing suppression would apply to all occupied GRSG habitat. Although this could expand the size of the area in which the unintended consequence of promotion of juniper and conifer succession could occur, the extent of suitable sharp-tailed grouse habitat lost to forest succession would still be negligible; it would be outweighed by the beneficial effect of protecting sagebrush habitat from wildfire. In addition, measures to manage vegetation for good or better ecological condition and focusing fuel breaks on areas of human habitation or significant disturbance would benefit sharp-tailed grouse habitat as well. The

general effects of fire suppression and fuels treatments under Alternative C would be similar to those of Alternative A.

Cumulative Effects

The cumulative effect of management actions related to fire and fuels under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects described in Alternative B. The would not be substantial, would not change the population trend, and would not remove or fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative C. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plant treatments would continue. The short-term negative impacts of these activities on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative C would provide an added benefit to sharp-tailed grouse. Therefore, Alternative C's direct and indirect effects of invasive plant management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Conifer Encroachment—Direct and Indirect Effects

As with Alternatives A and B, Alternative C does not directly address conifer encroachment; however, the weed measures described for Invasive Plants under Alternative C and the fuels treatments described above in Fire and Fuels would also likely reduce juniper encroachment and the general effects of it on sharp-tailed grouse and its habitat, as described under Alternative A.

Cumulative Effects

Under Alternative C, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments that could reduce juniper encroachment would be instituted. This is opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative C's direct and indirect effects of conifer encroachment management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Livestock Grazing—Direct and Indirect Effects

Under Alternative C, grazing would be eliminated in all occupied GRSG habitat. This would reduce the potential for both negative and positive grazing-related impacts on Columbia sharp-tailed grouse and its habitat discussed under Alternative A. This is more than any of the other alternatives. No new water developments or range improvements would be constructed in occupied habitat, and only habitat treatments that benefit GRSG would be allowed. Retirement of grazing would be allowed and fast tracked.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), livestock grazing would be eliminated in all occupied GRSG habitat, providing a net benefit to sharp-tailed grouse. Therefore, Alternative C's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV, when combined with the past, present, and reasonably foreseeable future actions, would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative C. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management under Alternative C for energy development would increase protection of all occupied habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative C, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all occupied habitat to existing closures and proposing it for withdrawal. Therefore, Alternative C's direct and indirect effects of energy development on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Recreation under Alternative C. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Recreation management actions under Alternative C would increase protection of all occupied GRSG habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS,

BLM 2013) some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative C's direct and indirect effects of recreation management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Alternative D

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for Infrastructure under Alternative D. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management associated with infrastructure under Alternative D would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative D's direct and indirect effects of infrastructure management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Refer to the GRSG effects discussion for Fire and Fuels under Alternative D. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

The cumulative effect of fire and fuels management actions under Alternative D, when combined with the past, present, and reasonably foreseeable future actions are similar to the cumulative effects under Alternative B. They are not expected to be substantial, to change the population trend, or to remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative D. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plant treatments would continue. Their short-term negative impacts on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to sharp-tailed grouse. Therefore, Alternative D's direct and indirect effects of invasive plants management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

Prioritizing vegetation rehabilitation projects to achieve the greatest improvement in GRSG abundance and distribution would also benefit the sharp-tailed grouse and its habitat. This includes those that address conifer encroachment in PHMA and GHMA. In addition, Alternative D's vegetation management tools would help to reduce conifer encroachment in PHMA, IHMA, and GHMA. They would reduce the types of impacts of conifer encroachment on the sharp-tailed grouse and its habitat described under Alternative A. Impacts from treatments associated with this alternative would also be the same as those described for vegetation treatments under Invasive Plants and Fire and Fuels for Alternative A. Alternative D would address conifer encroachment more so than Alternatives A, B, or C, so it is more protective of sharp-tailed grouse and sharp-tailed grouse habitat than those alternatives.

Cumulative Effects

Under Alternative D, in MZ I, conifer encroachment projects having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative D's direct and indirect effects of conifer encroachment management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Livestock Grazing—Direct and Indirect Effects

Refer to the GRSG effects discussion for Livestock Grazing under Alternative D. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to sharp-tailed grouse. Therefore, Alternative D's direct and indirect

effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative D. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative D, in MZ IV, some of the current management direction associated with energy development would continue, however, additional emphasis on protecting sagebrush would be included. Therefore, Alternative D's direct and indirect effects of energy development on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Recreation under Alternative D. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Alternative D would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative D's direct and indirect effects of recreation management on sharp-tailed grouse in MZ would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Alternative E1

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for Infrastructure under Alternative E1. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management of infrastructure under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat.

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW avoidance areas in sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of infrastructure management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Refer to the GRSG effects discussion for Fire and Fuels under Alternative E1. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management under Alternative E1 for fire and fuels management would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of fire on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative E1. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plants treatments would continue. The short-term negative impacts of these activities on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to sharp-tailed grouse. Therefore, Alternative E1's direct and indirect effects of invasive plants management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Conifer Encroachment—Direct and Indirect Effects

Under Alternative E1, the Forest Service would prioritize removing conifers using methods that would minimize disturbing GRSG and their habitat, to the extent possible, in PHMA and IHMA. In addition, as described above Invasive Plants, PHMA, IHMA, and GHMA would be managed to prevent invasion. Unlike Alternative D, Alternative E1 contains a specific restoration measure addressing conifer encroachment. However, Alternative D addresses conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. Treatments associated with these measures could negatively impact sharp-tailed grouse and their habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A). However, they would benefit GRSG and their habitat in the long term by reducing the impacts from conifer encroachment described in Conifer Encroachment under Alternative A. Negative impacts would be negligible due to prioritizing removal methods and minimizing disturbance.

Cumulative Effects

Under Alternative E1, in MZ IV, conifer encroachment projects would be instituted as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E1's direct and indirect effects of conifer encroachment management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Livestock Grazing—Direct and Indirect Effects

Refer to the GRSG effects discussion for Livestock Grazing under Alternative E1. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under would provide an added benefit to sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative E1. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management of energy development under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative E1, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of energy development on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Recreation under Alternative E1. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Recreation management under Alternative E1 would include timing and seasonal restrictions for the GRSG breeding season, thereby benefiting sharp-tailed grouse. Under Alternative E1, in MZ IV, some of the current recreation management direction would continue, but with an additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative E1's direct and indirect effects of recreation management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat

Alternative E2

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for Infrastructure under Alternative E2. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management for infrastructure under Alternative E2 would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with an additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW avoidance areas in sagebrush habitat. Therefore, Alternative E2's direct and indirect effects of infrastructure management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Fire and Fuels—Direct and Indirect Effects

Alternative E2 would implement the following unique strategies to address response to fire and reduce the general effects of fire on GRSG as discussed under Alternative A:

- Create and implement a statewide fire agency agreement that would eliminate jurisdictional boundaries and allow for immediate response to natural fire in PHMA
- Allow the use of fire-retardant vegetation that would buffer areas of high quality GRSG habitat from catastrophic fire
- Use prescriptive fire with caution in sagebrush habitat and only at higher elevations and in a manner designed prescriptively to benefit GRSG
- Conduct effective research into controlling fire size and protecting remaining GRSG areas next to high-risk cheatgrass areas
- Focus research on effective reclamation and restoration of landscapes altered by wildfire
- Manage winter habitat to maintain maximum amount of sagebrush, especially tall sagebrush (80 percent), which would be available to GRSG above snow during a severe winter
- Coordinate GRSG needs and efforts with the State of Utah committee that was formed to develop a process to protect the health and welfare by reducing the size and frequency of catastrophic fires

Similar to Alternative B, Alternative E2 would consider the use of prescriptive grazing to specifically reduce fire size and intensity on all types of landownership. Overall, the protective

benefits of Alternative E2 on Columbia sharp-tailed grouse and sagebrush habitat would likely be most similar to that of Alternative B; however, it would have similar short-term negative impacts on this species and its habitat as Alternative A for suppression and prescribed fire.

Cumulative Effects

Management under Alternative E2 for fire and fuels would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E2's direct and indirect effects of fire on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative E2. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plant treatments would continue. The short-term negative impacts of these activities on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to sharp-tailed grouse. Therefore, Alternative E2's direct and indirect effects of invasive plants management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

Alternative E2 includes a habitat restoration and vegetation management conservation measure specific to conifer encroachment. It would aggressively remove encroaching conifers and other plant species to expand GRSG habitat where possible. Treatments associated with the measures in Alternative E2 could negatively impact sharp-tailed grouse and sagebrush habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A). However, they would provide a long-term benefit to the species and its habitat by reducing the negative impacts of conifer encroachment described in Alternative A. In comparison, Alternative D would address conifer encroachment as part of several restoration and fire suppression measures and over a larger area. This would provide a greater benefit to sharp-tailed grouse and sagebrush

habitat. Alternative E2 is most similar to Alternative E1, except it does not include a stipulation for prioritizing removal methods minimizing disturbance.

Cumulative Effects

Under Alternative E2, in MZ IV, conifer encroachment projects would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E2's direct and indirect effects of conifer encroachment management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Livestock Grazing—Direct and Indirect Effects

Refer to the GRSG effects discussion for Livestock Grazing under Alternative E2. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to sharp-tailed grouse. Therefore, Alternative E2's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative E2. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management for energy development under Alternative E2 would increase protection of GRSG and sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative E2, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E2's direct and indirect effects on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative E2. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Recreation management under Alternative E2 would reduce disturbance to GRSG, thereby benefiting sharp-tailed grouse. Under Alternative E2, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative E2's direct and indirect effects of recreation management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Alternative F

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for Infrastructure under Alternative F. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Refer to Alternative B. The cumulative effects of infrastructure management on sharp-tailed grouse and sagebrush habitat in MZ IV would be the same.

Fire and Fuels—Direct and Indirect Effects

Fire and fuels management under Alternative F would essentially be the same as that under Alternative B, and the impacts on Columbian sharp-tailed grouse would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of fire and fuels management on sharp-tailed grouse and sagebrush habitat in MZ IV would be the same.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under Alternative F. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Refer to Alternative B. The cumulative effects of invasive plants management on sharp-tailed grouse and sagebrush habitat in MZ IV would be the same.

Conifer Encroachment—Direct and Indirect Effects

Refer to the GRSG effects discussion for Conifer Encroachment under Alternative F. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Refer to Alternative B. The cumulative effects of conifer encroachment management on sharp-tailed grouse and sagebrush habitat in MZ IV would be the same.

Livestock Grazing—Direct and Indirect Effects

Refer to the GRSG effects discussion for Livestock Grazing under Alternative F. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under Alternative F, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative F would provide an added benefit to sharp-tailed grouse. Therefore, Alternative F's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under Alternative F. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management for energy development under Alternative F would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative F, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative F's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Recreation—Direct and Indirect Effects

Alternative F would follow the same general approach as Alternative A; however, like Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted

in PHMA. In addition, in all occupied habitat, camping areas within 4 miles of active leks would be closed seasonally. These conservation measures would also benefit Columbia sharp-tailed grouse from the effects of general recreation described for sharp-tailed grouse under Alternative A. Closing camping areas within 4 miles of active GRSG leks could benefit sharp-tailed grouse leks in sagebrush closest to the sagebrush/mountain shrub or sagebrush/grassland interface or in areas with more grass.

Cumulative Effects

Recreation management under Alternative F would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under Alternative F, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative F's direct and indirect effects of recreation management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Proposed Plan

Infrastructure—Direct and Indirect Effects

Refer to the GRSG effects discussion for Infrastructure under the Proposed Plan. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Management of infrastructure under the Proposed Plan would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW avoidance areas in sagebrush habitat. Therefore, the Proposed Plan's direct and indirect effects of infrastructure management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Refer to the GRSG effects discussion for Fire and Fuels under the Proposed Plan. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

The cumulative effect of fire and fuels management actions under the Proposed Plan, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects described in Alternative B and D. They would not be substantial, would not change the existing population trend, and would not remove or fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Refer to the GRSG effects discussion for Invasive Plants under the Proposed Plan. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plant treatments would continue. The short-term negative impacts of these activities on sharp-tailed grouse and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under the Proposed Plan would provide an added benefit to sharp-tailed grouse. Therefore, the Proposed Plan's direct and indirect effects of invasive plant management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

Prioritizing vegetation rehabilitation projects designed to achieve the greatest improvement in GRSG abundance and distribution, including those that address conifer encroachment, in all GRSG habitats would also benefit the sharp-tailed grouse and its habitat. In addition, the Proposed Plan's vegetation management tools, described in the GRSG discussions for Invasive Plants and Fire and Fuels, would help to reduce conifer encroachment in all GRSG habitats and to reduce the types of impacts of conifer encroachment on the sharp-tailed grouse and its habitat that were described under Alternative A. Impacts from treatments of the Proposed Plan would be the same as those for vegetation treatments under Invasive Plants and Fire and Fuels under Alternative A. The Proposed Plan would address conifer encroachment more so than Alternatives A, B, and C and so is more protective of sharp-tailed grouse and its habitat than those alternatives.

Cumulative Effects

Under the Proposed Plan, in MZ I, conifer encroachment projects having the potential to reduce juniper encroachment would be instituted as opposed to no specific conifer encroachment

management under Alternative A. Therefore, the Proposed Plan's direct and indirect effects of conifer encroachment management on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Livestock Grazing—Direct and Indirect Effects

Refer to the GRSG effects discussion for Livestock Grazing under the Proposed Plan. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under the Proposed Plan would provide an added benefit to sharp-tailed grouse. Therefore, the Proposed Plan's direct and indirect effects of livestock grazing on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Refer to the GRSG effects discussion for Energy Development under the Proposed Plan. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

Under the Proposed Plan, in MZ IV, some of the current management direction associated with energy development would continue, but with additional emphasis on protecting sagebrush. Therefore, the Proposed Plan's direct and indirect effects of energy development on sharp-tailed grouse in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitats (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Refer to the GRSG effects discussion for Recreation under the Proposed Plan. The effects would generally be the same for the Columbian sharp-tailed grouse.

Cumulative Effects

The Proposed Plan would increase protection of sagebrush habitat, thereby benefiting sharp-tailed grouse rather than removing or fragmenting its habitat. Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current

recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, the Proposed Plan's direct and indirect effects of recreation management on sharp-tailed grouse in MZ would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on sharp-tailed grouse or sagebrush habitat.

C. Rocky Mountain elk (*Cervus canadensis*; Beaverhead-Deerlodge National Forest)

Distribution

The Rocky Mountain elk's range is all of Idaho, western and eastern Oregon and Washington, the northwestern tip of California and portions of Arizona, New Mexico, Utah, Colorado, Montana, and Manitoba. The distribution closely follows Beaverhead-Deerlodge National Forest lands year-round.

Habitat Associations and Threats

Elk are habitat generalists that primarily use coniferous forests interspersed with natural or man-made openings (mountain meadows, grasslands, burns, and logged areas), but habitat varies between populations and areas. Basic habitat components are security, shelter (which it may use to maintain thermal equilibrium), and forage production. Moist sites are preferred in the summer. High open road densities reduce habitat effectiveness, and good winter range is critical. Rocky Mountain elk are migratory in some areas, moving between seasonal ranges, and it is nonmigratory in others. Sagebrush grasslands provide winter range forage.

Population, Status, Abundance, and Trend

This species is ranked as secure—at very low risk of extirpation, extinction, or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats—both globally (G5) and in the state of Montana (S5; Montana Field Guide 2013).

Beaverhead-Deerlodge National Forest MIS Monitoring

Rocky Mountain elk are a Beaverhead-Deerlodge National Forest MIS for important commonly hunted species. Its population demographics are monitored by the Montana Fish, Wildlife and Parks Department. Figure 2 shows deer and elk hunting units overlapping the Beaverhead-Deerlodge National Forest.

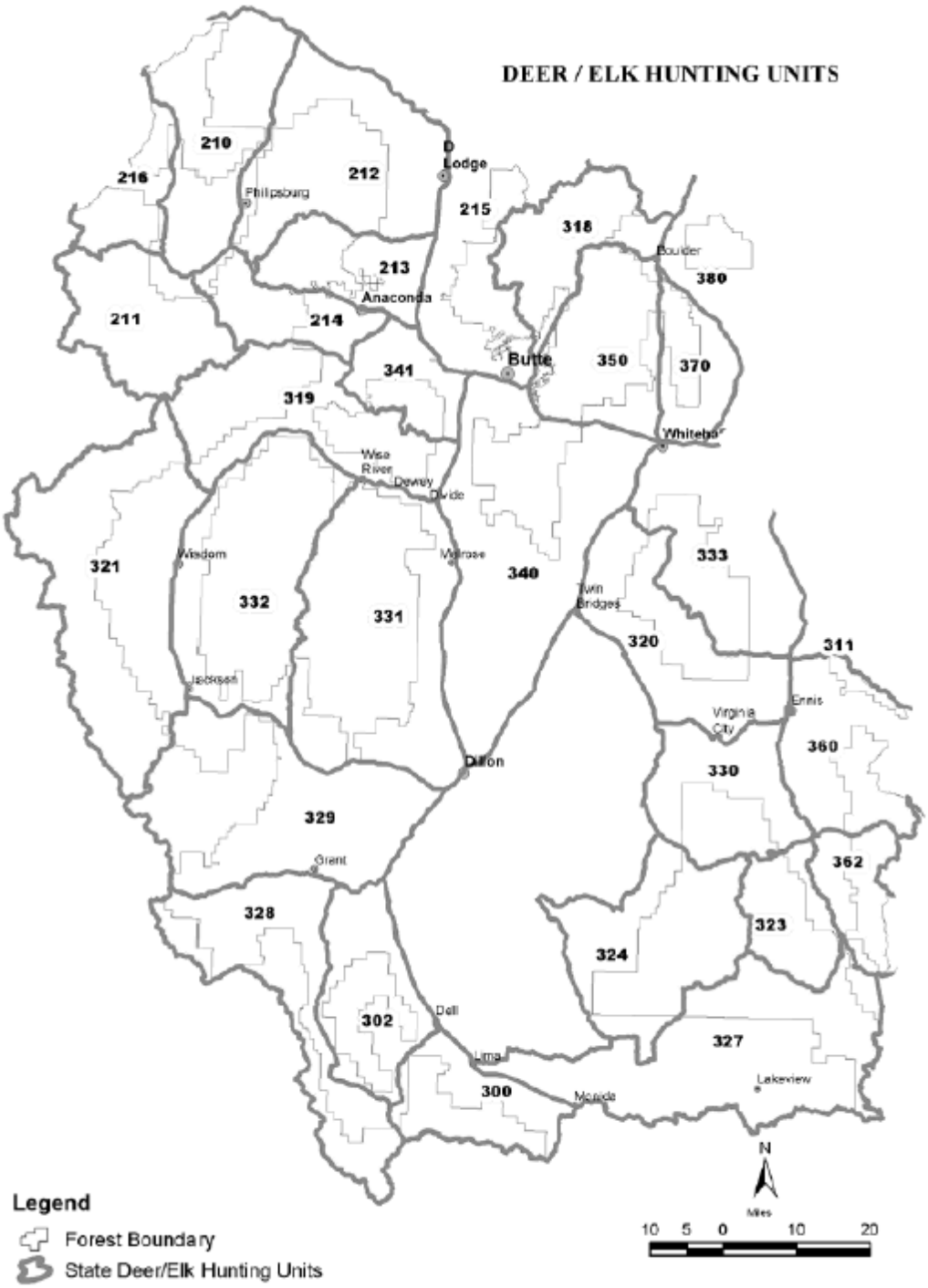

Figure 2. State deer and elk hunting units and districts in the Beaverhead-Deerlodge National Forest

Figure 3 shows 2005 Montana Fish, Wildlife and Parks State Elk Plan population objectives for Beaverhead-Deerlodge National Forest hunting units and districts and annual estimates for each unit between 1992 and 2011. Deerlodge National Forest units are highlighted in yellow. As of the 2011 estimates, elk numbers for those hunting units encompassing Beaverhead-Deerlodge National Forest lands have reached 139 percent of the 2005 Montana Elk Plan total objectives for those units.

FWP SW MT Elk Mngt Units (EMU)	1992 Elk Plan SW MT EMU Estimates *	2004 Elk Plan SW MT EMU Estimates*		BDNF Hunting Districts within SW MT EMUs	2005 FWP State Elk Plan Objective ±20%	FWP 2003 Estimates ± 10%	FWP 2006 Estimates ± 10%	FWP 2007 Estimates ± 10%	FWP 2008 Estimates	FWP 2010 Estimates	FWP 2011 Estimates
Deerldge	2350	1879		210	2500	1043	952	1020	1391	1644	2683
Flint Cr	1400	1500		211	600	679	485	262	135	1125	334
Rock Cr	2200	3165		212	850	1100	1074	1494	1825	2504	2693
Sapphire	3500	3500		213	650	401	689	484	660	1325	1243
Highland	1600	1500		214	200	309	270	284	331	400	193
Fleecer	1500	2000		215	1000	736	1144	1234	1502	2145	2569
Gravelly	7000-7500	9000		216	325	457	288	473	140	314	279
Madison	6500-7000	7200		300	700-900	615	1137	1450	1883	806	2129
T-Root	800-900	1350		302	550-700	399	736	956	1195	783	1239
Tendoy	2000	2200		311	2700	2096	3100	3000	2620	2620	2620
Pioneer	3000	1900		318	500	366	383	535	656	519	519
				319	1100 Max	1515	936	819	911	854	1023
				320 333	1000 for both	1130 549	942 470	745 477	954 859	1433 atobjective	1573 for both
				321	None	No winter elk	No winter elk	No winter elk	No estimate	No estimate at objective	No estimate. No wintering elk
				323 324	Gravelly EMU Total	3119 3114	2682 2500	2265 1928	2268 2608	No separate estimates – At	No separate estimates Gravelly

				327 330 Total	= 7000	No winter elk 1830 (8063)	No winter elk 1132 (6314)	No winter elk 1116 (5309)	No estimate 1328 (6204)	objective	over objectives at 12066
				328	550-700	574	650	635	620	643	1008
				329	900 Max	582	683	727	766	(273 partial survey)at objective	1190
				331	1400 Max	1250	896	1085	773	869	930
				332	900 Max	506	600	376	588	568	494
				340 350 370	1600 combined for all	219 602 330 (1151)	557 268 192 (1017)	839 500 (1339)	423 529 529 (1481)	1915 for all at objective	340=1164 350=713 370=see 340
				341	600 Max	669	494	272	166	416	370
				360	2200	4555	1914	1661	2494	1090	1396
				362	2500	1159	3629	3845	3524	4203	4029
Total SW MT EMU Estimate*	31,850-32,950	35,194		**TOTAL**	**30,575**	**28,074**	**28,803 stable**	**28,482 stable**	**31,925 increasing**	**31,305 stable-increase**	**42,457**

Figure 3. Southwest Montana elk population trends 1992 to 2011. Note that Sapphire and Rock Cr. EMU boundaries overlap hunting units on the Bitterroot and Lolo National Forests and that 1992 Elk Plan estimates do not differentiate hunting unit estimates.

Alternative A

Infrastructure—Direct and Indirect Effects

Existing LUP direction would apply under Alternative A. There would be no changes to the current National Forest System infrastructure, including to power lines, wind turbines, communications towers, fences, or roads. Permitted ROWs would continue to allow construction, maintenance, and operation activities that could result in habitat loss, fragmentation, or degradation of sagebrush winter range habitat or result in barriers to migration corridors. Construction and maintenance of infrastructure would continue to lead to higher short-term concentrations of human noise and disturbance that could disrupt foraging or other behaviors or temporarily displace individuals. These activities could also lead to new infestations of noxious or invasive weeds and increase edge habitat. Though most projects would be forced to mitigate or minimize impacts, this alternative would likely have the greatest impact on sagebrush habitat used by Rocky Mountain elk as winter range and seasonal migration routes.

Cumulative Effects

The baseline date for the cumulative impacts analysis for Rocky Mountain elk is 2012. The temporal scope of this analysis is a 20-year planning horizon; land use planning documents are generally evaluated on a 5-year cycle. The temporal boundary for cumulative effects analysis for Rocky Mountain elk is the WAFWA MZ IV (Snake River Plain) for GRSG. This is because all of the Idaho/Montana planning area, with the exception of a small portion of private lands in MZ II in the southeastern corner of Idaho, is in MZ IV, and it is large enough to encompass wider-ranging species such as elk.

Current infrastructure management would continue under Alternative A. ROW exclusion or avoidance areas would not be instituted the same as they would be in Alternatives B, C, D, E1, E2, or F. Therefore, under Alternative A, the direct and indirect effects of infrastructure management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss and fragmentation of sagebrush habitat and disturb elk in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Fire and Fuels—Direct and Indirect Effects

Alternative A would continue to manage wildfire and prescribed burns under current direction. This would have the fewest restrictions for fire and fuels management and a high potential for vegetation disturbance. Prescribed burns could be used in sagebrush habitat to control fuel loading. This action could benefit sagebrush habitat used by elk as winter range by creating grass forage, but it could also negatively impact elk through the short-term elimination of browse species. Policies would not prioritize protection or restoration of mature sagebrush habitat. Winter range could be removed or degraded because of the use of heavy equipment or hand tools. Another potential impact is the changes in movement patterns due to areas devoid of vegetation.

In addition, suppression may initially raise the rates of juniper encroachment in some areas, eliminating forage for Rocky Mountain elk and culminating in heavy fuel loadings. This can contribute to larger-scale wildfires that eliminate browse species in adjacent areas.

Cumulative Effects

Current wildfire suppression operations and fuels management would continue under Alternative A. The limitation or prohibition of the use of prescribed fire in sagebrush habitats and the sagebrush protection emphasis during wildland fire operations would not be instituted as they would be under Alternatives B, C, D, E1, E2, and F. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may increase the loss and fragmentation of sagebrush habitat from wildfire in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Alternative A would continue the management of invasive weeds under current direction. To reduce the likelihood of invasive weed spread and the extent of current infestations, mechanical, manual, chemical, and biological control would be used. Existing coordinated weed management areas would remain in effect, and firefighting vehicles would be washed before deployment. These policies would limit impacts from spread of weeds as effectively as possible under current resource constraints.

The spread of weeds would continue to pose a substantial threat to the planning area by altering plant community structure and composition, productivity, nutrient cycling, and hydrology. This could fragment or degrade Rocky Mountain elk winter range. Weeds may cause declines in native plant populations, including sagebrush habitat, through competition or displacement. In cases where monocultures occur, weeds could eliminate vegetation that elk use for food. In addition, invasive plants can fragment sagebrush habitat or reduce habitat quality or create long-term changes in ecosystem processes, such as fire cycles.

Current treatments and vegetation management typically focus on vegetation composition and structure for fuels management, habitat management, and productivity manipulation. These are done to improve the habitat and forage conditions for ungulates and other grazers, using surface soil stabilization to increase productivity or removing invasive plants. Management of vegetation resources to protect GRSG would alter vegetative communities by promoting increases in sagebrush height, herbaceous cover, and vegetation productivity. Treatments designed to prevent encroachment of shrubs, nonnative species, or woody vegetation would alter the condition of native vegetation communities by changing the density, composition, and frequency of species in plant communities. The intent of these management programs is to improve rangeland condition and enhance sagebrush ecosystems. Vegetation treatments could negatively impact sagebrush habitat in the short term from vegetation removal, but it would result in long-term improvements.

Cumulative Effects

Under Alternative A, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. The short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. Therefore, Alternative A’s direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

Expansion of conifer woodlands, especially juniper, displaces the shrubs, grasses, and forbs that elk use as winter range forage through direct competition for resources. On the other hand,

conifers can provide additional thermal and security cover. Alternative A does not directly address conifer encroachment. However, habitat restoration and vegetation management policies described above under Invasive Plants and fuels treatments described under Fire and Fuels would likely also reduce juniper encroachment.

Cumulative Effects

Current conifer encroachment management would continue under Alternative A, and the measures addressing conifer encroachment would not be instituted as they would be in several of the action alternatives. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may increase the loss and fragmentation of sagebrush habitat from conifer encroachment in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Livestock Grazing—Direct and Indirect Effects

Under this alternative, livestock grazing would continue to be managed under current direction. There would be no change in the locations, numbers, timing, or method of livestock grazing in these national forests. Depending on site-specific management, beneficial or adverse impacts of grazing on elk or their habitat would continue. Grazing practices can benefit sagebrush habitat by reducing fuel load, protecting intact sagebrush habitat, and increasing habitat extent and continuity. However, grazing at inappropriate intensity, season, or location may result in elk winter range deterioration. In addition, grazing can degrade meadow/wetland/spring/stream habitat.

Under current direction, the Forest Service may use a number of mechanisms to reduce the potential for negative impacts from grazing. The only planning-level decision available is to decide where areas would be open and closed to livestock grazing. Future impacts would be eliminated in areas closed to grazing, but past impacts would likely persist for some time, and closing grazing may result in other harmful impacts. Other changes in management would occur at the implementation level during the permit renewal process, which occurs every ten years and for which subsequent NEPA analysis would be conducted. At the implementation level, changes in grazing practices or systems can be considered, which could reduce grazing intensity or change the season of use, for example. In addition, changes in grazing management in riparian and wet meadows can reduce impacts in these important habitats.

Cumulative Effects

Under Alternative A, in MZ IV, livestock grazing would continue to be managed through existing grazing plans, with methods and guidelines from the existing plans followed to maintain ecological conditions according to Standards for Rangeland Health. Therefore, Alternative A's direct and indirect effects of livestock grazing on elk in MZ IV would be largely neutral. When

combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Under Alternative A, all mineral leasing and development and wind energy development would continue to be managed under current direction. As such, this alternative would cause the greatest number of direct and indirect impacts on Rocky Mountain elk and their habitat, as follows:

- Loss, degradation, and fragmentation of winter range by roads, pipelines and power lines
- Higher levels of noise
- Increased presence of roads and humans
- More anthropogenic structures in an otherwise open landscape, which could result in disturbance or displacement

Cumulative Effects

Management under Alternative A would maintain the current acreage open to energy development. Current energy development activities would continue under Alternative A. Areas would not be closed to energy development as they would be under most of the action alternatives. Therefore, under Alternative A, the direct and indirect effects of energy development, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss and fragmentation of the sagebrush habitat from energy development in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Under this alternative there would be no changes to the current National Forest System Roads, transportation plan, or recreation management on these forests. Under current management, travel on Forest Service-administered lands is limited to designated roads. There would be minimal seasonal restrictions. In general, the more acres and miles of routes that are designated in an area, the greater the likelihood of disturbance to wildlife and fragmentation of habitat. In addition, less restrictive travel conditions usually mean higher concentrations of human use next to motorized routes. This can disrupt or temporarily displace wildlife. In addition, impacts from roads may include habitat loss from road construction, noise disturbance from vehicles, and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats. This alternative has the highest potential to impact elk due to the lack of restrictions on activities that cause these effects. Therefore, all direct and indirect effects on the species and its habitat would likely cause current trends to continue.

Cumulative Effects

Current recreation management would continue under Alternative A. Recreational disturbances to GRSG would not be limited, as they would be under the action alternatives. Under Alternative A, the direct and indirect effects from recreation management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss and fragmentation of the sagebrush habitat and disturb elk in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Alternative B

Infrastructure—Direct and Indirect Effects

Alternative B places a 3 percent disturbance threshold on new ROWs or SUAs in PHMA. Under this alternative, all PHMA would be managed as exclusion areas and GHMA would be managed as avoidance areas for new ROW and SUA projects. Alternative A would require collocating new ROWs or SUAs with existing infrastructure. It would remove, bury, or modify existing power lines in PHMA. Although this activity or ongoing maintenance could disturb elk, the likelihood is small, because elk would use overlapping PHMA primarily during the winter. In PHMA, new facilities would be collocated with existing facilities, where possible. Existing roads or realignments would be used to access valid existing rights that are not yet developed. New roads would be constructed to the absolute minimum standard necessary if valid existing rights could not be accessed via existing roads.

This alternative would maximize connectivity and minimize loss, fragmentation, degradation, and disturbance of sagebrush habitats. This would benefit species whose ranges overlap PHMA, such as Rocky Mountain elk, where there are power lines, communication towers, and roads. Elk using winter range outside PHMA would likely experience little change in direct or indirect effects. However, if this measure were to concentrate new infrastructure development in winter range outside PHMA, rather than just reducing it, the extent of impacts on elk using sagebrush winter range outside PHMA could increase under Alternative B, relative to Alternative A. Impacts for infrastructure would be similar to those described for Alternative A.

Cumulative Effects

Management actions associated with infrastructure management under Alternative B would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue; however, protecting sagebrush habitat and preventing disturbance to GRSG would be emphasized. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative B's direct and indirect effects of infrastructure management on elk in MZ IV would be largely beneficial. When combined with the past,

present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Under Alternative B, suppression would be prioritized in PHMA to protect mature sagebrush habitat. Suppression would be prioritized in GHMA only where fires threaten PHMA. Suppression-related juniper encroachment discussed in Alternative A could increase in some areas under Alternative B. This would eliminate forage for elk whose winter range overlaps with PHMA. It would eventually result in heavy fuel loadings that could contribute to larger wildfires that eliminate browse species in adjacent areas.

Alternative B does not include any other specific management for wildland fire management in GHMA. Fuels treatments would be designed to protect sagebrush ecosystems by maintaining sagebrush cover, implementing fuel breaks, applying seasonal restrictions, protecting GRSG winter range, and requiring use of native seeds. Post-fuels treatments would be designed to ensure long-term persistence of seeded areas and native plants and to maintain 15 percent canopy cover. Fuels treatments would also monitor and control for invasive species, and fuels management BMPs would incorporate invasive plant prevention measures. These measures would benefit elk winter range overlapping PHMA by eliminating competition with or exclusion of forage species. Overall, these conservation measures would reduce the threat of wildfire to sagebrush, compared to Alternative A, although the general effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

Management actions under Alternative B, with respect to fire and fuels management, would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting elk rather than removing or fragmenting its habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat during suppression activities and pre-suppression planning and staging for maximum protection of sagebrush habitat. Fuels treatment activities would focus on protecting sagebrush habitat, primarily in PHMA. Therefore, Alternative B's direct and indirect effects of fire on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Under Alternative B, weed control efforts would continue to be managed under current direction (see Alternative A). However, vegetation management conservation measures would benefit weed control by prioritizing restoration, including reducing invasive plants and, in turn, benefiting elk by eliminating competition with or exclusion of forage species. The BLM and

Forest Service would require the use of native seeds and would design post-restoration management to ensure the long-term persistence of restoration and would take into consideration changes in climate when determining species for restoration. Invasive species would also be monitored and controlled after fuels treatments and at existing range improvements. Alternative B incorporates fewer invasive plant management measures in GHMA than in PHMA. However, many of the same habitat restoration and vegetation management actions would be applied, including prioritizing the use of native seeds. Together, these measures would reduce impacts on elk winter range overlapping PHMA from invasive plants, as described under Alternative A, although the effects of the treatments would be the same.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. The short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative B would provide an added benefit to sagebrush habitat. Therefore, Alternative B's direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Conifer Encroachment—Direct and Indirect Effects

Like Alternative A, Alternative B does not directly address conifer encroachment; nevertheless, the vegetation management conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the negative impacts of conifer encroachment on Rocky Mountain elk winter range, as discussed under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments that could reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative B's direct and indirect effects of conifer encroachment management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Livestock Grazing—Direct and Indirect Effects

Alternative B would implement a number of beneficial management actions in PHMA to incorporate GRSG habitat objectives and management considerations into livestock grazing management. These are as follows:

- Completing Land Health Assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Considering retiring vacant allotments
- Improving management of riparian areas and wet meadows
- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Implementing BMPs for West Nile virus
- Removing, modifying, or marking fences

Several management actions to reduce impacts from livestock grazing on GRSG GHMA would be incorporated, including the potential to modify grazing systems to meet seasonal GRSG habitat requirements and management to improve the conditions of riparian areas and wet meadows. Together these efforts would reduce the potential for negative grazing-related impacts on elk winter range overlapping PHMA, as described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative B would provide an added benefit to sagebrush habitat. Therefore, Alternative B's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Energy Development—Direct and Indirect Effects

Under this Alternative, PHMA would be closed to new fluid mineral leasing, nonenergy leasable mineral leasing, and mineral material sales, and it would be proposed for withdrawal from mineral entry. In addition, mandatory BMPs would be applied as conditions of approval on fluid mineral leases. Existing leases entirely in PHMA would require 4-mile NSO buffers around leks, limiting disturbances in sections to the 3 percent threshold, and application of numerous conservation measures to reduce impacts from mineral exploration and development.

Alternative B does not include specific management for fluid, salable, locatable, and nonenergy leasable minerals in GHMA or wind energy in PHMA or GHMA. As a result, current trends would continue and impacts would be similar to those under Alternative A. Although Alternative B does not directly address wind energy or industrial solar development, its 3 percent threshold for anthropogenic disturbances (including highways, roads, geothermal wells, wind turbines, and associated facilities) would apply to energy development and would limit the extent of all types of energy development in PHMA. These measures would reduce the impacts of energy

development on Rocky Mountain elk winter range overlapping PHMA, as described under Alternative A.

Cumulative Effects

Energy development management under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting elk rather than removing or fragmenting habitat. Under Alternative B, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative B's direct and indirect effects on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Recreation—Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to existing/designated roads, so Alternative B conservation measures directed toward limiting motorized travel to designated roads, primitive roads, and trails and travel management would not be applicable. Under Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA, and there would be limited opportunities for road construction in PHMA, with minimum standards applied and no upgrading of current roads. Although general impacts would be the same as Alternative A, Alternative B is more restrictive. It would likely reduce loss and fragmentation of elk winter range overlapping PHMA by minimizing road construction or upgrades. This alternative could reduce human disturbance to elk in sagebrush winter range overlapping with PHMA if it were to include restrictions on snowmobile use in these areas. Otherwise, elk would not receive much benefit from restrictions on recreational SUAs meant to curb human disturbance in PHMA. If these measures were to apply to snowmobile use and ended up concentrating recreation and additional roads outside PHMA rather than just reducing it, the extent of impacts on elk winter range outside of PHMA could increase under Alternative B, relative to Alternative A.

Cumulative Effects

Recreation management under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting elk rather than removing or fragmenting its habitat. Under Alternative B, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative B's direct and indirect effects of recreation management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Alternative C

Infrastructure—Direct and Indirect Effects

Alternative C would have the most protective measures for Rocky Mountain elk in terms of infrastructure. Alternative C would extend many of the Alternative B conservation measures to all occupied GRSG habitat, and all occupied GRSG habitat would be managed as an exclusion area for new ROW projects. As a result, Alternative C would encourage consolidation of sagebrush habitats, facilitate habitat conservation and management, and reduce the impacts of infrastructure on Rocky Mountain elk and winter range described under Alternatives A and B in a wider area than Alternative B. Unlike Alternative B, which would permit wind energy siting in PHMA provided a development disturbance threshold of 3 percent were not exceeded, Alternative C would not permit wind energy development in any occupied GRSG habitat. This measure would protect larger areas of sagebrush habitat from degradation and fragmentation and could prevent or reduce disturbance to or displacement of elk over a larger area than Alternative B.

As with Alternative B, Alternative C would remove, bury, or modify existing power lines, but this would apply to all occupied GRSG habitat. This could degrade more elk winter range during implementation and maintenance.

Cumulative Effects

Infrastructure management under Alternative C would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative C's direct and indirect effects of infrastructure management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Alternative C is similar to Alternative B, except that it is more protective of elk habitat. This is because prioritization of suppression would apply to all occupied GRSG habitat. It includes measures to manage vegetation for good or better ecological condition, and it focuses fuel breaks on areas of human habitation or significant disturbance. The negative impacts of fire suppression on conifer encroachment and fire suppression and fuels treatments on elk winter range discussed under Alternative A would be offset by prioritizing restoration treatments described below for invasive plants. The general effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

The cumulative effect of fire and fuels management under Alternative C, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects described in Alternative B. The effects would not be substantial, would not change the population trend, and would not remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Alternative C would maintain the direction described under Alternative A, along with additional provisions that would limit invasive weed spread in all occupied GRSG habitat. Vegetation management would benefit weed control efforts by prioritizing restoration, including reducing invasive plants, in all occupied GRSG habitat. In all cases, local native plant ecotype seeds and seedlings would be used. These policies would reduce impacts from invasive plants on elk winter range overlapping occupied GRSG habitat, as described under Alternative A. They would have similar impacts associated with treatment but would include additional conservation measures specific to limiting the spread of invasive plants. In addition, grazing would be eliminated in all occupied GRSG habitat, thereby eliminating the potential for invasive plant spread by livestock in elk winter range overlapping GRSG occupied habitat. This would make Alternative C more protective of elk habitat than Alternatives A or B.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plants treatments would continue. The short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative C would provide an added benefit to elk. Therefore, Alternative C's direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Conifer Encroachment—Direct and Indirect Effects

Like Alternatives A and B, Alternative C does not directly address conifer encroachment but the weed control policies described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would also likely reduce juniper encroachment. Therefore, the negative and beneficial effects of conifer encroachment in elk habitat, as described under Alternative A, would both be reduced.

Cumulative Effects

Under Alternative C, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative C's direct and indirect effects of conifer encroachment management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Livestock Grazing—Direct and Indirect Effects

Under Alternative C, grazing would be eliminated in all occupied GRSG habitat, reducing the potential for both negative and positive grazing-related impacts on sagebrush habitat and elk winter range discussed under Alternative A, more so than any of the other alternatives. No new water developments or range improvements would be constructed in occupied habitat and only habitat treatments that benefit GRSG would be allowed; most habitat treatments would be expected to benefit Rocky Mountain elk as well. Retirement of grazing would be allowed and would be fast tracked.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), livestock grazing would be eliminated in all occupied GRSG habitat, providing a net benefit to elk. Therefore, Alternative C's direct and indirect effects of livestock grazing on elk in MZ IV, when combined with the past, present, and reasonably foreseeable future actions would not substantially increase impacts on elk or sagebrush habitat.

Energy Development—Direct and Indirect Effects

Alternative C would expand the protections under Alternative B to all occupied GRSG habitat and would prohibit new exploration permits for unleased fluid minerals. Like Alternative B, the conservation measures would reduce the general impacts of energy development on elk winter range, described under Alternatives A and B, but possibly to a larger degree than any of the other alternatives. This is because of the greater potential for overlap with elk winter range. Unlike Alternative B, Alternative C would prohibit wind energy development in occupied GRSG habitat. This measure would protect larger areas of sagebrush habitat from degradation and fragmentation and could prevent or reduce disturbance to or displacement of elk over a larger area.

Cumulative Effects

Under Alternative C, energy management would increase protection of all occupied habitat, thereby benefiting elk rather than removing or fragmenting its habitat. Under Alternative C, in

MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting existing sagebrush habitat by adding all occupied habitat to existing closures and proposing it for withdrawal. Therefore, Alternative C's direct and indirect effects of energy development on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Alternative C is similar to Alternative B but applies to all occupied GRSG habitat as opposed to PHMA. Therefore, it could protect a larger amount of Rocky Mountain elk winter and migration habitat from the general recreation impacts described in Alternatives A and Alternative B.

Cumulative Effects

Recreation management actions under Alternative C would increase protection of all occupied GRSG habitat, thereby benefiting elk rather than removing or fragmenting its habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative C's direct and indirect effects of recreation management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Alternative D

Infrastructure—Direct and Indirect Effects

Under Alternative D, PHMA, IHMA, and GHMA would be designated ROW avoidance areas, as opposed to ROW exclusion areas for PHMA under Alternative B or all occupied habitat under Alternative C. New authorizations would be collocated, when possible, in or next to disturbance footprints to avoid disturbing GRSG or its habitat. In PHMA, new authorizations for the following would not be allowed:

- Transmission facilities greater than 50 kV
- Wind and solar developments
- Commercial geothermal, nuclear, gas or oil developments
- Airports
- Ancillary facilities associated with any of the aforementioned development
- Paved or gravel roads or landfills

In IHMA, wind and solar development would be restricted where adverse effects could not be mitigated; GHMA would be an avoidance area for wind or solar reauthorization.

New ROWs and SUAs allowed in PHMA and IMHA would not result in a net loss of GRSG habitat. New authorizations or facilities would be sited outside of the 1.86-mile lek avoidance buffer areas unless NEPA analysis suggested a greater or lesser required distance. New power and communications lines in PHMA, IHMA, and GHMA outside of existing ROWs would be required to be buried; existing lines would be evaluated for burying, modifying, or relocating to at least 1.86 miles from occupied leks or winter habitat. These conservation measures would reduce the impacts on elk and their habitat from infrastructure relative to existing management under Alternative A. They may provide some additional reduction in impacts over Alternative B but would not be as protective of elk and its habitat as under Alternative C.

Cumulative Effects

Infrastructure management under Alternative D would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting their habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative D's direct and indirect effects of infrastructure management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Alternative D would prioritize fire suppression in PHMA and IHMA, which together equal PHMA. Unlike Alternative B, it would also include the following conservation measures in PHMA, IHMA, and GHMA to strategically reduce fire effects:

- Planning and firefighter training in sagebrush management
- Designing and implementing fuels treatments, with an emphasis on maintaining, protecting, and expanding GRSG habitats
- Considering conifer encroachment as areas to manage wildfire for resource benefit

Overall, Alternative D would limit damage to sagebrush habitat areas from wildfire. Although it is similar to Alternatives B and C in prioritizing fire suppression, Alternative D would prioritize it in more GRSG habitat than Alternative B (only PHMA) and less than Alternative C (all occupied habitat). The general effects of fire suppression and fuels treatments would be similar to those described in Alternative A. Delineating conifer encroachment in PHMA, IHMA, and GHMA GRSG habitats as areas to manage wildfire for resource benefit could reduce the extent of suppression-related juniper encroachment discussed in Alternative B. This would protect elk forage and reduce fuel loadings that could contribute to larger-scale wildfires in adjacent sagebrush habitats.

Cumulative Effects

The cumulative effect of fire and fuels management under Alternative D, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative effects described in Alternative B. They would not be substantial, would not change the population trend, and would not remove or fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Under Alternative D, the direction described under Alternative A would be maintained, making it the same in terms of impacts from invasive plants and associated treatments. Similar to those of Alternative B, vegetation management conservation measures in this alternative would benefit weed control in the long term. It would do this by prioritizing restoration, including reducing invasive plants, and monitoring and controlling invasive species after construction and fuels treatments and at new range improvements. Unlike Alternative B, monitoring and controlling invasive species after fuels treatments and at new range improvements would apply to PHMA, IHMA, and GHMA, rather than only PHMA. These policies would reduce the impacts of invasive plants described under Alternative A on elk winter range overlapping these areas.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plants treatments would continue. The short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to elk. Therefore, Alternative D's direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

Alternative D would prioritize vegetation rehabilitation projects designed to achieve the greatest improvement in GRSG abundance and distribution, including those that address conifer encroachment in PHMA, IHMA, and GHMA. Factors contributing to higher emphasis would include the likelihood of conifer encroachment into GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in PHMA, IHMA, and GHMA and to reduce the negative impacts of conifer encroachment on elk habitat, as described under Alternative A. Impacts from treatments associated with this alternative would be the same as those described for vegetation treatments under Invasive Plants and Fire and Fuels under Alternative A. Alternative D would address

conifer encroachment more so than Alternatives A, B, or C and therefore is more protective of elk winter range overlapping GRSG IHMA than any of those alternatives.

Cumulative Effects

Under Alternative D, in MZ I, conifer encroachment projects having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative D's direct and indirect effects of conifer encroachment management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Livestock Grazing—Direct and Indirect Effects

Management under Alternative D would include the same conservation measures as Alternative B, but it expands many of those measures to PHMA, IHMA, and GHMA. It would also manage for vegetation composition (including riparian and lentic areas) and structure consistent with appropriate GRSG seasonal habitat objectives relative to site potential. Both Alternatives D and F apply the same conservation measures as Alternative B. However, Alternative B largely applies only to PHMA, whereas Alternative D applies to PHMA, IHMA, and GHMA, and Alternative F applies to all occupied habitat. Together, these efforts would reduce the potential for negative grazing-related impacts on elk winter range described under Alternative A, more so than Alternatives B or E but less than Alternative C. It would be similar to Alternative F.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to elk. Therefore, Alternative D's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Alternative D would close most PHMA to future fluid mineral leasing and nonenergy minerals leasing and development. It would place additional stipulations and seasonal restrictions on existing and future fluid mineral leases in certain IHMA: leasing would be allowed subject to standard seasonal and daily stipulations in breeding and winter habitat. Well density would not be allowed to exceed 1/640 acres, and an NSO of 1.86 miles would be allowed around leks. In addition, IHMA would be closed to nonenergy minerals leasing. In GHMA, NSOs would be allowed for nonenergy minerals leasing or within 1.86 miles of PHMA and IHMA, or for future fluid mineral leasing within 1.86 miles of occupied leks. Otherwise, GHMA would be available

for fluid or nonenergy minerals leasing, subject to applicable seasonal and daily timing restrictions. Geophysical exploration would be allowed in PHMA, IHMA, and GHMA, subject to seasonal timing restrictions and other restrictions that may apply. These actions would reduce the impacts of mineral development on elk, discussed under Alternative A, to a level similar to that of Alternative B.

Unlike Alternative B, Alternative D directly addresses solar and wind energy development, which would not be allowed in PHMA. In IHMA, wind and solar energy development would be restricted where adverse effects could not be mitigated. Ancillary facilities, such as roads and electric lines, could be authorized, provided mitigation would prevent any net loss of GRSG habitat. GHMA would be considered avoidance for wind and solar development. These actions could reduce the negative impacts of energy development on elk and their winter range overlapping with IHMA, relative to Alternatives A and B.

Cumulative Effects

Under Alternative D, in MZ IV, some of the current management direction for energy development would continue, but additional emphasis on protecting sagebrush would be included. Therefore, Alternative D's direct and indirect effects of energy development on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Alternative D would apply the following conservation measures to reduce the potential negative impacts of recreation on GRSG in PHMA, IHMA, and GHMA:

- Special recreation permits would be analyzed on a case-by-case basis and recreation would be directed away from sensitive seasons and areas
- Certain developed recreation sites and associated facilities would be designed or designated to direct recreation away from sensitive areas
- Seasonal restrictions for authorized activities would be incorporated

Under Alternative D, these measures would reduce the general impacts of recreation on elk in winter range overlapping PHMA, IHMA, and GHMA, described under Alternatives A and B, more so than Alternatives A, B, or C because it includes additional measures.

Cumulative Effects

Alternative D would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting their habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and

preventing disturbance to GRSG. Therefore, Alternative D's direct and indirect effects of recreation management on elk in MZ would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Alternative E1

Infrastructure—Direct and Indirect Effects

Alternative E1 is similar to Alternative B but is not as restrictive. Core habitat and IHMA would generally be identified as new ROW avoidance areas. In core habitat, new infrastructure ROWs or SUAs would be collocated with existing infrastructure. In IHMA, new infrastructure could be built if habitat protection criteria were met. General impacts on elk and elk habitat under Alternative E1 would be the same as those for Alternative A. Because Alternative E1 includes fewer limitations on infrastructure in GRSG habitat than Alternative B, the potential for some infrastructure-related impacts on elk may be higher. Alternative E1 would reduce the likelihood of impacts from infrastructure on elk, compared to existing management under Alternative A. However, it would not be as protective of sagebrush habitat as Alternative D, which would designate PHMA, IHMA, and GHMA as new ROW avoidance areas, or as Alternatives C or F, which would generally manage all occupied GRSG habitats as new ROW exclusion areas.

Cumulative Effects

Infrastructure management under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting its habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW avoidance areas in sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of infrastructure management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

Alternative E1 would focus resources to reduce wildfire in sagebrush areas, prioritizing fire suppression and maintaining fuel breaks in core habitat and IHMA. Fuels treatments would protect existing sagebrush ecosystems. Fire response times to core habitat and IHMA would be reduced to limit fire damage. This alternative is unique in that adaptive management would be used to account for acres of habitat lost to fire in core habitat and IHMA. Although these measures would reduce the threat of wildfire to sagebrush and reduce damage to elk winter range overlapping with core habitat, IHMA, and in some cases GHMA, suppression-related juniper encroachment discussed in Alternative A could increase in some areas under Alternative E1.

This would eliminate winter forage for elk and eventually would result in heavy fuel loadings, which could contribute to larger wildfires. However, this would be offset to a certain degree by restoration and vegetation management measures that prioritize the removal of conifers in core habitat and IHMA.

The general effects of fire suppression and fuels treatments under Alternative E1 would be similar to those of Alternative A. Alternative E1 would be more protective in terms of elk winter range overlapping GRSG habitat, due to the combination of suppression prioritization and adaptive management measures; however, it would have similar short-term negative impacts on elk habitat as Alternatives B, C, and D from fuel break construction and maintenance.

Cumulative Effects

Fire and fuels management under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting their habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of fire on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Alternative E1 would maintain the policies described under Alternative A. It would include additional measures to protect core habitat and IHMA and GHMA, which would be managed to prevent invasion. Invasive plants threatening GRSG habitat would be eradicated and controlled in core habitat and IHMA, and invasive plants would be monitored for three years following a fire in these habitat areas. The measures under Alternative E1 would significantly reduce the impacts of invasive plants described under Alternative A on elk winter range overlapping core habitat, IHMA, and GHMA. It would be more protective in terms of controlling invasive plants in elk winter range in these areas. However, the short-term impacts on elk habitat associated with invasive plant treatments under Alternative A would be the same and could affect a larger area.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plant treatments would continue. The short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to elk. Therefore, Alternative E1's direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Conifer Encroachment—Direct and Indirect Effects

Alternative E1 would prioritize conifer removal in core habitat and IHMA using methods that would minimize disturbance to GRSG. Conifer encroachment projects would focus on areas with the highest restoration potential (low canopy cover, existing sagebrush understory, and next to GRSG populations) and would not be conducted in juniper stands older than 100 years. In addition, as described above for Invasive Plants, core habitat, IHMA, and GHMA would be actively managed to prevent invasion. Unlike Alternative D, Alternatives E1 and E2 contain a specific restoration measure addressing conifer encroachment. However, Alternative D addresses conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. Although treatments associated with these measures have the potential to negatively impact sagebrush habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A), they would benefit elk winter range in the long term by reducing the negative impacts from conifer encroachment described in Conifer Encroachment under Alternative A.

Cumulative Effects

Under Alternative E1, in MZ IV, conifer encroachment projects would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E1's direct and indirect effects of conifer encroachment management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Livestock Grazing—Direct and Indirect Effects

Alternative E1 takes a very different approach to livestock grazing than the other alternatives. Management under Alternative E1 would add GRSG guidelines to grazing management plans in core habitat and IHMA. Rangeland health assessments and permit renewal assessments would be conducted in core habitat and IHMA; allotments in core habitat that have declining GRSG populations would be prioritized, followed by allotments in IHMA that contain breeding habitats with decreasing lek counts. If assessments determined that livestock grazing were limiting the achievement of desired habitat characteristics, grazing permits would be adjusted during the renewal process to include measures to achieve desired conditions. These measures would reduce the potential for elk winter range deterioration in areas where it overlaps GRSG core habitat and IHMA. Relative to Alternative B, Alternative E1 focuses less management on riparian areas, meadows, and other wetlands.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would

provide an added benefit to sagebrush habitat. Therefore, Alternative E1's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Alternative E1 would follow much of the current guidance on leasing and development of mineral resources (Alternative A) but would add measures to minimize impacts on GRSG that could also minimize impacts on elk winter range, as follows:

- in core habitat and IHMA, exploration for oil and gas that used temporary roads would be permissible if site disturbance were minimized
- In core habitat and IHMA, surface occupancy associated with oil and gas development would not be allowed, unless the surface development would not accelerate or cause GRSG populations to decline
- Surface disturbance from roads associated with fluid mineral development would be limited to 3 percent in core habitat and 5 percent in IHMA of suitable habitat per an average of 640 acres
- Wind energy development projects would comply with all infrastructure development BMPs and the 2012 USFWS Wind Energy Guidelines

Impacts on elk from energy development would essentially continue as described in Alternative A, although their magnitude and spatial distribution would differ. The effects of wind energy on elk, as described in Infrastructure and Energy Development under Alternative A, would be reduced as the result of compliance with USFWS Wind Energy Guidelines.

Cumulative Effects

Energy management under Alternative E1 would increase sagebrush habitat protection, thereby benefiting elk rather than removing or fragmenting their habitat. Under Alternative E1, in MZ IV, some of the current energy development management direction would continue; however, additional emphasis on protecting sagebrush habitat would be included. Therefore, Alternative E1's direct and indirect effects of energy development on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Recreation—Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to designated roads, so Alternative E1 conservation measures directed toward limiting motorized travel to designated roads, primitive roads, and trails and travel management would not be applicable. Under Alternative E1, timing and seasonal restrictions would be applied to activities known to

disturb nesting GRSG. This approach would likely have little beneficial effect on Rocky Mountain elk relative to the other alternatives because elk generally use sagebrush habitats as part of their winter range.

Cumulative Effects

Recreation management under Alternative E1 would include timing and seasonal restrictions for the GRSG breeding season, which would be neutral to elk. Under Alternative E1, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative E1's direct and indirect effects of recreation management on elk in MZ IV would be largely neutral. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Alternative E2

Infrastructure

For all ROWs and SUAs in PHMA, management stipulations and conditions would focus on mitigating direct disturbance to GRSG during construction. PHMA would be designated as an avoidance area for new ROWs and SUAs, which is less protective of GRSG habitat than Alternatives B, C, or F but similar to Alternatives D and E1.

Similar to Alternatives B, C, and F, Alternative E2 would include a disturbance cap. However, it would apply a 5 percent as opposed to a 3 percent disturbance cap, and the areas that the caps would apply to and the types of disturbances that contribute toward the caps would differ.

Similar to Alternative D, Alternative E2 directly addresses siting wind energy facilities, but Alternative E2 would be less restrictive than Alternative D. It would avoid rather than exclude siting wind energy developments in PHMA and would apply BMPs and industry, state, and federal stipulations where siting in PHMA could not be avoided.

Similar to Alternative E1, Alternative E2 would not promote the undergrounding of utilities. Electrical transmission lines, and where feasible and consistent with federally required electrical separation standards, new linear transmission features would be sited in existing corridors, or at a minimum, in concert with existing linear features in GRSG habitat.

The effects of infrastructure on elk and sagebrush habitat described under Alternative A would be reduced for elk using winter habitat overlapping GRSG PHMA. GRSG habitat outside PHMA would not be managed for to conserve the species, and no specific management actions are provided for this habitat. Therefore, current trends for elk would continue outside of PHMA.

Cumulative Effects

Infrastructure management under Alternative E2 would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting their habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW avoidance areas in sagebrush habitat. Therefore, Alternative E2's direct and indirect effects of infrastructure management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Fire and Fuels

Alternative E2 would implement the following unique measures to address response to fire and reduce the general effects of fire on sagebrush habitat as discussed under Alternative A:

- Create and implement a statewide fire agency agreement that would eliminate jurisdictional boundaries and allow for immediate response to natural fire in GRSG PHMA
- Use prescriptive fire with caution in sagebrush habitat and only at higher elevations
- Conduct effective research into controlling fire size and protecting remaining GRSG areas next to high-risk cheatgrass areas
- Focus research on effective reclamation and restoration of landscapes altered by wildfire
- Manage winter habitat to maintain maximum amount of sagebrush, especially tall sagebrush (80 percent), which would be available to GRSG above snow during a severe winter
- Coordinate the needs and efforts related to GRSG with the State of Utah committee that was formed to develop a process to protect the health and welfare by reducing the size and frequency of catastrophic fires

These measures would generally benefit sagebrush habitat and Rocky Mountain elk. However, the following measures, could negatively impact Rocky Mountain elk winter range, depending on the types of species used for fire retardant vegetation and specific prescriptions:

- Allow the use of fire-retardant vegetation that would buffer areas of high quality GRSG habitat from catastrophic fire
- Use prescribed fire in a manner designed prescriptively to benefit GRSG
- Consider the use of prescriptive grazing to specifically reduce fire size and intensity on all types of landownership, where appropriate

Overall, the protective benefits of Alternative E2 on elk and sagebrush habitat would likely be most similar to that of Alternative B, but it would have similar short-term negative impacts on elk and sagebrush habitats as Alternative A for suppression and prescribed fire.

Cumulative Effects

Fire and fuels management under Alternative E2 would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting their habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, Alternative E2's direct and indirect effects of fire on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Invasive Plants

Alternative E2 directs land managers to aggressively respond to new infestations to keep invasive species from spreading. Every effort would be made to identify and treat new infestations before they become larger problems. Additionally, containment of known infestations in or near sagebrush habitats would be a high priority for all land management. Vegetation management tools described above for Fire and Fuels and below for Livestock Grazing would help to reduce the general impacts of invasive plants on GRSG, as described under Alternative A. Alternative E2, like Alternative E1, would be more protective by controlling invasive plants in sagebrush habitat and reducing the impacts of invasive plants on sagebrush habitat than any of the other alternatives.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plant treatments, would continue, and the short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to elk. Therefore, Alternative E2's direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Conifer Encroachment

Alternative E2 includes a habitat restoration and vegetation management conservation measure specific to conifer encroachment that would aggressively remove encroaching conifers and other plant species to expand GRSG habitat where possible. Treatments under Alternative E2 would generally benefit elk and sagebrush habitat in the long term by reducing the negative impacts of conifer encroachment as described in Conifer Encroachment under Alternative A; however,

thermal cover could be reduced, in some instances. In comparison, Alternative D would address conifer encroachment as part of several restoration and fire suppression measures and over a larger area. This would provide a greater benefit to elk and sagebrush habitat. Alternative E2 is most similar to Alternative E1, except it does not include a stipulation for prioritizing removal methods minimizing disturbance. This difference would have little bearing on elk using these habitats as winter range.

Cumulative Effects

Under Alternative E2, in MZ IV, conifer encroachment projects would be instituted as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E2's direct and indirect effects of conifer encroachment management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Livestock Grazing

Alternative E2 would continue to make GRSG PHMA and GHMA available for livestock grazing. Should site-specific concerns be raised about the effects of grazing on GRSG habitat, and such effects were documented over a sufficiently long time frame, corrective management actions would be addressed through the application of BMPs. Incompatible grazing strategies would be addressed through established rangeland management practices consistent with the maintenance or enhancement of habitat. GRSG requirements for seasonal habitat (leks, nesting and early brood rearing, late brood rearing, and winter) would be considered when managing sagebrush rangelands.

Water developments would be designed to enhance mesic habitat for use by GRSG and to maintain adequate vegetation in wet meadows. In PHMA, GRSG stipulations would take precedence over stipulations for other species if conflicts were to occur, if otherwise allowable by law. New infestations of invasive exotic plants would be responded to aggressively to prevent spreading. Overall, measures associated with livestock grazing under Alternative E2 would reduce the potential for the negative effects of grazing on elk, as described under Alternative A, and would benefit elk and sagebrush habitat. The only exception would be if and where GRSG stipulations would conflict with any stipulations for elk. In general, Alternative E2 would be less protective of elk and sagebrush habitat than Alternatives B, C, D, or F.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to elk. Therefore, Alternative E2's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past,

present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Energy Development

Under Alternative E2, PHMA would be considered to be suitable for further coal leasing and coal mining. PHMA and GHMA that is not already withdrawn or proposed for withdrawal would be available for locatable mineral entry. PHMA would be open to mineral materials and oil and gas leasing and would be an avoidance area for wind energy development, although it would not be precluded. All of the aforementioned forms of energy development, as well as nonenergy leasable mineral lands, solid mineral exploration, and geophysical exploration activities, would be subject to the following:

- Disturbance in PHMA would be avoided, if possible, or it would be minimized by locating development in habitat of the least importance, if avoidance in PHMA is not possible; project proponents would have to demonstrate why avoidance would not be possible
- Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area
- Barriers to migration, if applicable, would be avoided

All existing fluid mineral uses are explicitly recognized by this alternative and would not be affected by its implementation. The GRSG conservation measures identified in the associated NEPA documents for each of these projects would continue to be implemented to protect GRSG and its habitat. Provisions of this alternative would not be added to the measures identified for each specific project.

GRSG habitat outside PHMA would not be managed to conserve the species, and no specific management actions are provided for this habitat. Similar to Alternative E1, impacts on elk and sagebrush habitat from energy development activities under Alternative E2 would essentially continue as described in Alternative A, although they would be somewhat reduced by the application of BMPs.

Cumulative Effects

Energy conservation management under Alternative E2 would increase protection of GRSG and sagebrush habitat. Under Alternative E2, in MZ IV, some of the current energy development management direction would continue, however additional emphasis on protecting sagebrush habitat would be included. Therefore, Alternative E2's direct and indirect effects on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Recreation

Alternative E2 conservation measures with the greatest potential to affect elk or their winter range are the following:

- In PHMA, disturbance would be avoided, if possible, or minimized by locating development in habitat of the least importance to GRSG if avoidance is not possible; project proponents would have to demonstrate why avoidance would not be possible
- Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area
- Barriers to migration, if applicable, would be avoided

Alternative E2 has the potential to be more protective of elk and elk winter range than any of the alternatives, provided developments do not end up being concentrated in important elk winter range. This is because measures to reduce impacts would apply to all recreation, as opposed to SUAs or camping only.

Cumulative Effects

Recreation management under Alternative E2 would reduce disturbance to GRSG, thereby benefiting elk. Under Alternative E2, in MZ IV, some of the current recreation management direction would continue; however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Therefore, Alternative E2's direct and indirect effects of recreation management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Alternative F

Infrastructure—Direct and Indirect Effects

Land uses and realty management under Alternative F would essentially be the same as that under Alternative B. Refer to Alternative B. The effects on elk and elk winter range overlapping GRSG habitat would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of infrastructure management on Rocky Mountain elk and sagebrush habitat in MZ IV would be the same.

Fire and Fuels—Direct and Indirect Effects

Fire and fuels management under Alternative F would essentially be the same as that under Alternative B. The impacts on elk and their winter range overlapping GRSG habitat would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of fire and fuels management on Rocky Mountain elk and sagebrush habitat in MZ IV would be the same.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Invasive plants management under Alternative F would essentially be the same as that under Alternative B. Together, these measures would reduce impacts from invasive plants on sagebrush habitat, as described under Alternative A, but the effects of the treatments would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of invasive plants management on Rocky Mountain elk and sagebrush habitat in MZ IV would be the same.

Conifer Encroachment—Direct and Indirect Effects

Like Alternatives A and B, Alternative F does not directly address conifer encroachment and would maintain the invasive plant direction described under Alternative A. Although the types of impacts would be the same, the conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts on elk winter range from conifer encroachment. Those measures generally would apply throughout occupied GRSG under Alternative F, whereas they would be limited to PHMA under Alternative B. Because of this, Alternative F could provide an additional reduction in the magnitude of impacts on elk winter range from conifer encroachment relative to Alternative B.

Cumulative Effects

Refer to Alternative B. The cumulative effects of conifer encroachment management on Rocky Mountain elk and sagebrush habitat in MZ IV would be the same.

Livestock Grazing—Direct and Indirect Effects

Alternative F would include beneficial management actions similar to those of Alternative B except they would apply in all GRSG habitats, as follows:

- Completing land health assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Considering retiring vacant allotments
- Improving management of riparian areas and wet meadows
- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Implementing BMPs for West Nile virus

- Removing, modifying, or marking fences

Together these efforts would reduce the potential for negative impacts from grazing on elk and elk winter range described under Alternative A.

Cumulative Effects

Under Alternative F, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative F would provide an added benefit to elk. Therefore, Alternative F's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Energy Development—Direct and Indirect Effects

Under Alternative F siting wind energy development would be prevented in PHMA, which would be closed to new fluid mineral leasing, nonenergy leasable mineral leasing, and mineral material sales. It would be proposed for withdrawal from mineral entry; no NSO would be stipulated for leased fluid minerals, and a 3 percent disturbance cap would be applied. Numerous conservation measures would be implemented to reduce impacts from mineral exploration and development in PHMA. As with Alternative B, Alternative F does not include specific management for locatable, salable, or nonenergy minerals in GHMA. Unlike Alternative B, Alternative F directly addresses wind energy and fluid minerals development outside of PHMA: wind energy would be sited at least 5 miles from active GRSG leks and at least 4 miles from the perimeter of GRSG winter habitat. Areas within 4 miles of active GRSG leks would be closed to new fluid minerals leasing. Alternative F, although similar to Alternative B, would reduce the impacts of energy development on elk and elk winter range, as described under Alternative A, more so than Alternative B. This is because it addresses siting of wind energy and fluid minerals leasing outside of PHMA more thoroughly than Alternative B.

Cumulative Effects

Energy management under Alternative F would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting elk rather than removing or fragmenting habitat. Under Alternative F, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. Therefore, Alternative F's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Recreation—Direct and Indirect Effects

Alternative F would follow the same general approach as Alternative A; however, as with Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA. In addition, in all occupied habitat, camping areas within 4 miles of active leks would be closed seasonally. The general recreational effects of Alternative F on elk and their winter range would be the same to Alternatives A and B. Seasonal closures would have no impact on Rocky Mountain elk because elk use sagebrush habitat as winter range.

Cumulative Effects

Recreation management under Alternative F would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting its habitat. Under Alternative F, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative F's direct and indirect effects of recreation management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Proposed Plan

Infrastructure—Direct and Indirect Effects

Under the Proposed Plan, PHMA, IHMA, and GHMA would be designated ROW avoidance areas. This is as opposed to ROW exclusion areas for PHMA under Alternative B or all occupied habitat under Alternative C. New authorizations would be collocated, when possible, in or next to existing disturbances to avoid disturbing GRSG or its habitat. In PHMA, a subset of PHMA, new authorizations for the following would not be allowed:

- Transmission facilities greater than 50 kV
- Wind and solar developments
- Commercial geothermal, nuclear, gas or oil developments
- Airports
- Ancillary facilities associated with any of the aforementioned development, paved or gravel roads, or landfills

In IHMA, wind and solar development would be restricted where adverse effects could not be mitigated; GHMA would be an avoidance area for wind or solar reauthorization.

New ROWs and SUAs PHMA and IHMA would not result in a net loss of GRSG habitat. New authorizations or facilities would be sited outside of the 1.86-mile lek avoidance buffer areas unless NEPA analysis were to suggest a greater or lesser required distance. New power and communications lines in PHMA, IHMA, and GHMA outside of existing ROWS would be required to be buried; existing lines would be evaluated for burying, modification, or relocation

to at least 1.86 miles from occupied leks or winter habitat. These conservation measures would reduce the impacts on elk and elk habitat from infrastructure relative to existing management under Alternative A. They may provide some additional reduction in impacts over Alternative B but would not be as protective of elk and their habitat as the measures proposed in Alternative C.

Cumulative Effects

Infrastructure management under the Proposed Plan would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting its habitat. Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management actions would continue; however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, the Proposed Plan's direct and indirect effects of infrastructure management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

Fire and Fuels—Direct and Indirect Effects

The Proposed Plan would prioritize fire suppression in PHMA and IHMA, which together equal PHMA. Unlike Alternative B, it would also include the following conservation measures in PHMA, IHMA, and GHMA to strategically reduce fire effects:

- Planning and firefighter training in sagebrush management
- Designing and implementing fuels treatments with an emphasis on maintaining, protecting, and expanding GRSG habitats
- Considering conifer encroachment as areas to manage wildfire for resource benefit

Overall, the Proposed Plan would limit damage to sagebrush habitat areas from wildfire. Although it is similar to Alternatives B and C in prioritizing fire suppression, the Proposed Plan would prioritize it in more GRSG habitat than Alternative B (only PHMA) and less than Alternative C (all occupied habitat). The general effects of fire suppression and fuels treatments would be similar to those described in Alternative A. Delineating conifer encroachment areas in PHMA, IHMA, and GHMA GRSG habitats as areas to manage wildfire for resource benefit could reduce the extent of suppression-related juniper encroachment discussed in Alternative B. This would protect elk forage and reduce fuel loadings that can contribute to larger wildfires in adjacent sagebrush habitats.

Cumulative Effects

The cumulative effect of fire and fuels management under the Proposed Plan, when combined with the past, present, and reasonably foreseeable future actions, are similar to the cumulative

effects described in Alternative B. They would not be substantial, would not change the population trend, and would not remove and fragment sagebrush habitat past a critical threshold in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Under the Proposed Plan, the direction described under Alternative A would be maintained, making it the same in terms of impacts from invasive plants and associated treatments. Similar to that of Alternative B, vegetation management conservation in this alternative would benefit weed control in the long term by prioritizing restoration. It would reduce invasive plants and would monitor and control invasive species after construction, fuels treatments, and new range improvements. Unlike Alternative B, under the Proposed Plan, monitoring and controlling invasive species after fuels treatments and at new range improvements would apply to PHMA, IHMA, and GHMA, rather than only to PHMA. These policies would reduce the impacts of invasive plants described under Alternative A on elk winter range overlapping these areas.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current invasive plants treatments would continue. The short-term negative impacts of these activities on elk and sagebrush habitats would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under the Proposed Plan would provide an added benefit to elk. Therefore, the Proposed Plan's direct and indirect effects of invasive plants management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Conifer Encroachment—Direct and Indirect Effects

Under the Proposed Plan, implementing vegetation rehabilitation projects designed to achieve the greatest improvement in GRSG abundance and distribution, including those that address conifer encroachment, in PHMA, GHMA, and IHMA would be prioritized. Factors contributing to higher emphasis would include the likelihood of conifer encroachment into GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in PHMA, IHMA, and GHMA and would reduce the negative impacts of conifer encroachment on elk habitat as described under Alternative A. Impacts from the Proposed Plan's treatments would be the same as those described for vegetation treatments under Invasive Plants and Fire and Fuels under Alternative A. The Proposed Plan would address conifer encroachment more so than Alternatives A, B, or C; therefore, it is more protective of elk winter range overlapping GRSG IHMA than any of those alternatives.

Cumulative Effects

Under the Proposed Plan, in MZ I, conifer encroachment projects that could reduce juniper encroachment would be instituted as opposed to no specific conifer encroachment management under Alternative A. Therefore, the Proposed Plan's direct and indirect effects of conifer encroachment management on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Livestock Grazing—Direct and Indirect Effects

Management under the Proposed Plan would include the same conservation measures as Alternative B but expands many of those measures to PHMA, IHMA, and GHMA. It would also manage for vegetation composition (including riparian and lentic areas) and structure consistent with appropriate GRSG seasonal habitat objectives relative to site potential. Both the Proposed Plan and Alternative F apply the same conservation measures as Alternative B. Alternative B largely applies only to PHMA, the Proposed Plan applies to PHMA, IHMA, and GHMA, and Alternative F applies to all occupied habitat. Together, these efforts would reduce the potential for negative grazing-related impacts on elk winter range under Alternative A, more so than Alternatives B or E but less than Alternative C. The Proposed Plan would be similar to Alternative F.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under the Proposed Plan would provide an added benefit to elk. Therefore, Alternative D's direct and indirect effects of livestock grazing on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats.

Energy Development—Direct and Indirect Effects

The Proposed Plan would close most PHMA to future fluid mineral leasing and nonenergy minerals leasing and development. It would place additional stipulations and seasonal restrictions on existing and future fluid mineral leases in certain IHMA: leasing would be allowed, subject to standard seasonal and daily stipulations in breeding and winter habitat and well density would not be allowed to exceed 1/640 acres; NSO of 1.86 miles would be allowed around leks. In addition, IHMA would be closed to nonenergy minerals leasing. In GHMA, NSO would be allowed for nonenergy minerals leasing, or within 1.86 miles of PHMA or IHMA, or for future fluid mineral leasing with 1.86 miles of occupied leks. Otherwise, GHMA would be available for fluid or nonenergy minerals leasing subject to applicable seasonal and daily timing restrictions.

Geophysical exploration would be allowed in PHMA, IHMA, and GHMA, subject to seasonal timing restrictions and other restrictions that may apply. These actions would reduce the impacts of mineral development on elk discussed under Alternative A to a level similar to that of Alternative B.

Unlike Alternative B, the Proposed Plan directly addresses solar and wind energy development. It would not be allowed in PHMA. In IHMA, wind and solar energy development would be restricted where adverse effects could not be mitigated. Ancillary facilities, such as roads and electric lines, could be authorized provided mitigation prevents any net loss of GRSG habitat. GHMA would be considered avoidance areas for wind and solar development. These actions could reduce the negative impacts of energy development on elk and their winter range overlapping with IHMA relative to Alternatives A and B.

Cumulative Effects

Under the Proposed Plan, in MZ IV, some of the current management direction associated with energy development would continue, but with additional emphasis on protecting sagebrush. Therefore, the Proposed Plan's direct and indirect effects of energy development on elk in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitats (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

The Proposed Plan would apply the following conservation measures to reduce the potential negative impacts of recreation on GRSG in PHMA, IHMA, and GHMA: Special Recreation Permits would be analyzed on a case-by-case basis. Certain developed recreation sites and associated facilities would be designed or designated to direct recreation away from sensitive areas, and seasonal restrictions for authorized activities would be incorporated. Under the Proposed Plan, these measures would reduce the general impacts of recreation on elk in winter range overlapping PHMA, IHMA, and GHMA that were described under Alternatives A and B more so than Alternatives A, B, and C because it includes additional measures.

Cumulative Effects

The Proposed Plan would increase protection of sagebrush habitat, thereby benefiting elk rather than removing or fragmenting habitat. Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current recreation management direction would continue; however, additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG would be included. Therefore, the Proposed Plan's direct and indirect effects of recreation management on elk in MZ would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on elk or sagebrush habitat.

D. Riparian Bird Species Richness

The Land and Resource Management Plan for the Curlew National Grassland (USDA Forest Service 2002, pp. 2-4, 2-5) uses general species richness of riparian breeding birds as a MIS for riparian habitats.

Habitat Associations and Threats

Riparian vegetation includes willow, cottonwood, and sedges. Threats to the Curlew National Grassland riparian vegetation primarily include fire and trespass grazing (i.e., grazing beyond forest plan standards).

Curlew National Grassland MIS Monitoring

Eight breeding bird survey transects have been established in the riparian areas of the Curlew National Grassland: Salyer, Meadowbrook, Rock Creek (3), Sheep Creek, North Canyon and Twin Springs. Fifty-two species of birds have been documented during the riparian breeding bird survey (Colt 2009).

Alternative A

Infrastructure—Direct and Indirect Effects

Existing LUP direction would apply under Alternative A. There would be no changes to the current National Forest System infrastructure, which includes power lines, wind turbines, communications towers, fences, and roads. Although infrastructure would not be sited in riparian areas, existing and new power lines, wind turbines, communications towers, fences, and vehicles traveling on associated roads would continue to pose a collision hazard to migratory riparian birds or those that also use upland habitats. It can also provide potential perching and nesting habitat for avian predators. Though most projects would be forced to mitigate or minimize impacts, this alternative could have the greatest impact on riparian birds and their habitat.

Cumulative Effects

The baseline date for the cumulative impacts analysis for riparian birds is 2012. The temporal scope of this analysis is a 20-year planning horizon; land use planning documents are generally evaluated on a 5-year cycle. The temporal boundary for cumulative effects analysis for riparian birds is the WAFWA MZ IV (Snake River Plain) for GRSG because all of the Idaho/Montana planning area, with the exception of a small portion of privately held lands in MZ II in the southeastern corner of Idaho, is in MZ IV.

Current infrastructure management would continue under Alternative A. ROW exclusion or avoidance areas would not be instituted, as they would be in Alternatives B, C, D, E1, E2, or F. Therefore, under Alternative A, the direct and indirect effects of infrastructure management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase

impacts on riparian birds in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Fire and Fuels—Direct and Indirect Effects

Alternative A would continue to manage wildfire and prescribed burns under current direction, which would have the fewest restrictions on fire and fuels management actions and a high potential for vegetation disturbance, although land management plan standards to protect riparian habitats are normally implemented. Prescribed burns could be used in sagebrush habitat where they are needed to control fuel loading. Policies would not prioritize protection or restoration of mature sagebrush habitat. Increased human activity and noise associated with wildland fire suppression and prescribed fire could disrupt nesting, breeding, or foraging behavior of riparian birds, although aforementioned land management plan standards to protect riparian habitats would minimize these effects. The use of heavy equipment or hand tools could lead to invasion of exotic plants into riparian areas, resulting in degradation of riparian areas. Other potential impacts are injuring or killing eggs or chicks or changing species movement patterns or distribution of prey species due to areas devoid of vegetation.

In addition, suppression may initially result in higher rates of juniper encroachment in some areas. In phase 1 of encroachment, fuel loadings remain consistent with the sagebrush understory. As juniper encroachment advances (phases 2 and 3) and the understory begins to thin, it causes the stands to become resistant to wildfire and further alter fire return intervals. During years of high fire danger, the resulting heavy fuel loadings in these stands can contribute to larger wildfires and can confound control efforts due to extreme fire behavior.

Cumulative Effects

Current wildfire suppression and fuels management would continue under Alternative A. The limitation or prohibition of the use of prescribed fire in sagebrush habitats and the sagebrush protection emphasis during wildland fire operations would not be instituted, as they would be in Alternatives B, C, D, E1, E2, and F. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may increase loss and fragmentation of the sagebrush habitat and adjacent riparian habitat from wildfire in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Alternative A would continue the management of invasive weeds under current direction. To reduce the likelihood of invasive weed spread and the extent of current infestations, mechanical, manual, chemical, and biological control are used. Existing coordinated weed management areas would remain in effect, and firefighting vehicles would be washed before being deployment. These policies would limit impacts from the spread of weeds as effectively as possible under

current resource constraints. Invasive plants (such as knapweeds, knotweeds, and thistles) degrade riparian habitats by competing with native plants.

Management of vegetation resources to protect GRSG would alter vegetative communities by promoting increases in sagebrush height and herbaceous cover and vegetation productivity. With the exception of the riparian/sagebrush interface, treatments in sagebrush habitat designed to prevent encroachment of shrubs, nonnative species, or woody vegetation would have little impact on riparian vegetation. Within the riparian sagebrush interface, riparian birds would be subject to disturbance, and riparian vegetation could be subject to small amounts of herbicide drift.

Cumulative Effects

Under Alternative A, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue, and the short-term negative impacts of these activities on riparian habitats would continue to be outweighed by the long-term beneficial impacts. Therefore, Alternative A's direct and indirect effects of invasive plants management on riparian habitat in MZ IV would be largely beneficial for riparian birds. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment—Direct and Indirect Effects

Expansion of conifer woodlands/juniper can negatively impact riparian areas. In areas of high juniper density, there is less precipitation to feed surface springs and streams because juniper plants intercept water and transpire it back into the atmosphere. As the carpet of native grasses converts to juniper, the soil hardens, creating bare ground and increasing runoff potential. Mature trees may offer perch sites for avian predators. Alternative A does not directly address conifer encroachment. However, habitat restoration and vegetation management policies described above under Invasive Plants and fuels treatments described under Fire and Fuels would likely also reduce juniper encroachment.

Cumulative Effects

Current conifer encroachment management would continue under Alternative A and the measures addressing conifer encroachment would not be instituted as they would be in several of the action alternatives. Under Alternative A, the direct and indirect effects, in conjunction with the past, present, and reasonably foreseeable future actions, may increase degradation of the riparian habitat from conifer encroachment in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Livestock Grazing—Direct and Indirect Effects

Under this alternative, livestock grazing would continue to be managed under current direction. There would be no change in the locations, numbers, timing, or method of livestock grazing in these national forests. Grazing practices can benefit riparian areas and birds by reducing fuel loads in adjacent sagebrush communities. However, grazing at inappropriate intensity, season, or location may alter or degrade riparian habitat. Cattle can trample or disturb individual birds or nests.

Under current direction, the Forest Service may use a number of mechanisms to reduce the potential for negative impacts from grazing on GRSG, which could also benefit riparian areas and birds. The only planning-level decision available is to decide where areas would be open and closed to livestock grazing. Future impacts would be eliminated in areas closed to grazing, but past impacts would likely persist for some time, and closing grazing may result in other harmful impacts. Other changes in management would occur at the implementation level during the permit renewal process, which occurs every ten years and for which subsequent NEPA analysis would be conducted. At the implementation level, changes in grazing management in riparian and wet meadows could be considered, which could reduce the potential for negative impacts.

Cumulative Effects

Under Alternative A, in MZ IV, livestock grazing would continue to be managed through existing grazing plans, with methods and guidelines from the existing plans followed to maintain ecological conditions according to Standards for Rangeland Health. Therefore, Alternative A's direct and indirect effects of livestock grazing ON riparian birds in MZ IV would be largely neutral for riparian birds. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

Under Alternative A, all mineral leasing and development and wind energy development would continue to be managed under current direction. As such, this alternative would cause the greatest level of direct and indirect impacts on riparian birds. Although energy development infrastructure would not be sited in riparian areas, turbines and vehicles traveling on associated roads would continue to pose a collision hazard to migrating riparian birds or those in upland habitats.

Cumulative Effects

Management under Alternative A would maintain the current acreage open to energy development, and current energy development would continue. Areas would not be closed to energy development, as they would be under most of the action alternatives. Therefore, under Alternative A, the direct and indirect effects of energy development, in conjunction with the past,

present, and reasonably foreseeable future actions, may increase disturbance or mortality of riparian birds in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Recreation—Direct and Indirect Effects

Under this alternative there would be no changes to the current National Forest System roads, transportation plan, or recreation management. Under current management, travel on Forest Service-administered lands is limited to designated roads. There would be minimal seasonal restrictions. In general, the more acres and miles of routes that are designated in an area, the greater the likelihood of wildlife habitat fragmentation and disturbance. In addition, less restrictive travel conditions usually mean higher concentrations of human use next to motorized routes and in riparian areas. This can disrupt nesting activities and cause abandonment of young and temporary displacement. In addition, impacts from roads may include habitat loss from road construction, noise disturbance from vehicles, and direct mortality from collisions with vehicles. This alternative has the greatest potential to impact riparian birds and habitat due to the lack of restrictions on activities that cause these effects. Therefore, all direct and indirect effects on riparian birds and habitat would likely cause current trends to continue.

Cumulative Effects

Current recreation management would continue under Alternative A. The limitation on recreation disturbances to GRSG would not be instituted, as they would be under the action alternatives. Under Alternative A, the direct and indirect effects from recreation management, in conjunction with the past, present, and reasonably foreseeable future actions, may increase the loss and fragmentation of the riparian habitat and disturb riparian birds in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013).

Alternative B

Infrastructure—Direct and Indirect Effects

Alternative B places a 3 percent disturbance threshold on new ROWs and SUAs in PHMA. Under this alternative, all PHMA would be managed as exclusion areas and GHMA would be managed as avoidance areas for new ROW and SUA projects. It would require new ROWs or SUAs to be collocated with existing infrastructure. In PHMA, new facilities would be collocated with existing facilities, where possible. Existing roads or realignments would be used to access valid existing rights that are not yet developed. New roads would be constructed to the absolute minimum standard necessary if valid existing rights could not be accessed via existing roads. This alternative would minimize infrastructure-related impacts on riparian birds in riparian areas overlapping PHMA. Collision hazards (power lines, communications towers, fences, and vehicles traveling on associated roads) for riparian birds that use upland habitats would be reduced, as would potential perching and nesting habitat for avian predators.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat which would benefit riparian birds by preventing collisions and predator perches. Therefore, Alternative B's direct and indirect effects of infrastructure management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Fire and Fuels—Direct and Indirect Effects

Under Alternative B, suppression would be prioritized in PHMA to protect mature sagebrush habitat and could, therefore, protect riparian habitat as well. Suppression would be prioritized in GHMA only where fires threaten PHMA. The effects of suppression-related juniper encroachment on riparian birds, as discussed under Conifer Encroachment in Alternative A, could increase in some areas under Alternative B. Alternative B does not include any other specific management for wildland fire management in GHMA. In addition, fuels treatments in PHMA would include monitoring and controlling invasive species; fuels management BMPs would incorporate invasive plant prevention measures. These measures would reduce the likelihood of invasion of exotic plants into riparian areas and the potential for degradation of riparian areas resulting from invasion.

Cumulative Effects

Management actions under Alternative B, with respect to fire and fuels management, would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting adjacent riparian habitat. Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat during suppression activities and suppression planning and staging for maximum protection of sagebrush habitat. Fuels treatment would focus on protecting sagebrush habitat, primarily in PHMA. Therefore, Alternative B's direct and indirect effects of fire on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Under Alternative B, weed control would continue to be managed under current direction (see Alternative A). However, vegetation management conservation measures would benefit weed control in PHMA by prioritizing restoration, including reducing invasive plants and by

monitoring and controlling them after fuels treatments and at existing range improvements. Together, these measures would reduce impacts on riparian habitat overlapping PHMA from invasive plants, as described under Alternative A, although the effects of the treatments would be the same.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. The minor, short-term negative impacts of these activities on riparian birds in adjacent riparian habitat would continue to be outweighed by the long-term beneficial impacts. However, additional emphasis on protecting sagebrush habitat under Alternative B would provide an added benefit to adjacent riparian habitat. Therefore, Alternative B's direct and indirect effects of invasive plants management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment—Direct and Indirect Effects

Like Alternative A, Alternative B does not directly address conifer encroachment; however, the vegetation management conservation measures for PHMA described above in Invasive Plants would reduce the negative impacts of conifer encroachment, as described under Alternative A, on riparian habitat overlapping PHMA.

Cumulative Effects

Under Alternative B, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments that could reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative B's direct and indirect effects of conifer encroachment management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Livestock Grazing—Direct and Indirect Effects

Alternative B would implement a number of beneficial management actions in PHMA to incorporate GRSG habitat objectives and management considerations into livestock grazing management. Those that could affect riparian birds and riparian habitat are as follows:

- Completing land health assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Considering retiring vacant allotments
- Improving management of riparian areas and wet meadows

- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Implementing BMPs for West Nile virus
- Removing, modifying, or marking fences

Several management actions to reduce impacts from livestock grazing on GRSG GHMA would be incorporated, including the potential to modify grazing systems to meet seasonal GRSG habitat requirements and management to improve the conditions of riparian areas and wet meadows. Together these efforts would reduce the potential for negative grazing-related impacts on riparian birds and riparian habitat overlapping PHMA, as described under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative B would provide an added benefit to adjacent riparian habitat. Therefore, Alternative B's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

Under this Alternative, PHMA would be closed to new fluid mineral leasing, nonenergy leasable mineral leasing, and mineral material sales, and it would be proposed for withdrawal from mineral entry. In addition, mandatory BMPs would be applied as conditions of approval on fluid mineral leases. Existing leases entirely in PHMA would require 4-mile NSO buffers around leks, limited disturbances in sections to the 3 percent threshold, and numerous conservation measures to reduce impacts from mineral exploration and development in PHMA.

Alternative B does not include specific management for fluid, salable, locatable, and nonenergy leasable minerals in GHMA or wind energy in PHMA or GHMA. As a result, current trends would continue, and impacts would be similar to those under Alternative A. Although Alternative B does not directly address wind energy development or industrial solar development, its 3 percent threshold for anthropogenic disturbances (including highways, roads, geothermal wells, wind turbines, and associated facilities) would apply to energy development and would limit the extent of all types of energy development in PHMA. These measures would reduce the impacts of energy development on riparian birds and their habitat, as discussed under Alternative A.

Cumulative Effects

Under Alternative B, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat. It would do this by adding all PHMA to existing closures and proposing it for withdrawal, thereby reducing the potential for predator perches and collisions with riparian birds. Therefore, Alternative B's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation—Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to designated roads; thus, Alternative B, which would limit motorized travel to designated roads, primitive roads, and trails and travel management, would not be applicable. Under Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA. There would be limited opportunities for road construction in PHMA, with minimum standards applied and no road upgrading. Restricting recreational SUAs in PHMA, as well as the travel restrictions under those SUAs, would have a minor beneficial effect on riparian habitat and birds by reducing the general recreational impacts, as discussed under Alternative A, to a small degree.

Cumulative Effects

Recreation management under Alternative B would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting adjacent riparian habitat and riparian birds. Under Alternative B, in MZ IV, some of the current recreation management direction would continue, with an additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative B's direct and indirect effects of recreation management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Alternative C

Infrastructure—Direct and Indirect Effects

Unlike Alternative B, which would permit wind energy siting in PHMA (provided a development disturbance threshold of 3 percent were not exceeded), Alternative C would not permit wind energy development siting in any occupied GRSG habitat. In addition, Alternative C would extend many of the Alternative B conservation measures to all occupied GRSG habitat; all occupied GRSG habitat would be managed as an exclusion area for new ROW projects. As a result, management under Alternative C would encourage consolidation of sagebrush habitats, facilitate habitat conservation and management, and reduce the impacts of infrastructure on riparian birds. This is as described under Alternatives A and B, but it would be in a wider area

than Alternative B. Therefore, of the three alternatives discussed so far, it would be the most protective of riparian birds in terms of infrastructure.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. This would benefit riparian birds by preventing collisions and predator perches. Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat. Therefore, Alternative C's direct and indirect effects of infrastructure management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Fire and Fuels—Direct and Indirect Effects

The conservation measures in Alternative C are similar to Alternative B, except that prioritization of suppression would apply to all occupied GRSG habitat. Therefore, more riparian habitat could be protected from wildfire, but the effects of suppression-related juniper encroachment on riparian birds, as discussed under Conifer Encroachment in Alternative A, could increase, relative to Alternative B, in some areas. Measures to manage vegetation for good or better ecology and to prioritize restoration treatments would reduce the likelihood of invasive plants into riparian areas, potentially degrading them. The general effects of fire suppression and fuels treatments would be similar to those of Alternative A.

Cumulative Effects

Fire and fuels management under Alternative C would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat. Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat during fire suppression. Therefore, Alternative C's direct and indirect effects of fire on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future, it actions would not substantially increase impacts on riparian birds or riparian habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Alternative C would maintain the direction described under Alternative A, along with additional provisions that would limit invasive weed spread in all occupied GRSG habitat. Vegetation management would benefit weed control by prioritizing restoration, including reducing invasive plants, in all occupied GRSG habitat. These policies would reduce impacts from invasive plants on riparian habitat overlapping occupied GRSG habitat, as described under Alternative A. It

would have similar impacts associated with treatment but would include additional conservation measures specific to limiting the spread of invasive plants. In addition, grazing would be eliminated in all occupied GRSG habitat, also eliminating the potential for invasive plant spread by livestock into riparian habitat overlapping GRSG occupied habitat. This would make Alternative C more protective of riparian habitat than Alternatives A or B.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. However, additional emphasis on protecting sagebrush habitat under Alternative C would provide an added benefit to adjacent riparian habitat. Therefore, Alternative C's direct and indirect effects of invasive plants management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment—Direct and Indirect Effects

As with Alternatives A and B, Alternative C does not directly address conifer encroachment; however, the weed control policies described above in Invasive Plants and the fuels treatments described above in Fire and Fuels could reduce juniper encroachment in the long term.

Cumulative Effects

Under Alternative C, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative C's direct and indirect effects of conifer encroachment management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Livestock Grazing—Direct and Indirect Effects

Under Alternative C, grazing would be eliminated in all occupied GRSG habitat, reducing the potential for both negative and positive grazing-related impacts on riparian birds and habitat, discussed under Alternative A, more so than any of the other alternatives. No new water developments or range improvements would be constructed in occupied habitat, which could benefit riparian habitat by preventing additional diversions from seeps or springs.

Cumulative Effects

Under Alternative C, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would be eliminated, which would provide an added benefit to adjacent

riparian habitat. Therefore, Alternative C's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

Alternative C would expand the protections under Alternative B to all occupied GRSG habitat and would prohibit new exploration permits for unleased fluid minerals. Unlike Alternative B, wind energy development would not be allowed in occupied GRSG habitat. As with Alternative B, the conservation measures would reduce the general impacts of energy development on riparian birds described under Alternatives A and B. However, the reduction could be to a larger degree than any of the other alternatives because of the greater potential for overlap of all occupied GRSG habitat with riparian habitat.

Cumulative Effects

Under Alternative C, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all occupied GRSG habitat to existing closures and proposing it for withdrawal. This would reduce the potential for predator perches and collisions with riparian birds. Therefore, Alternative C's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation—Direct and Indirect Effects

Alternative C is similar to Alternative B but applies to all occupied GRSG habitat, as opposed to only PHMA. Therefore, it could protect a larger number of riparian birds and habitat from the general recreation impacts described in Alternatives A and B.

Cumulative Effects

Recreation management under Alternative C would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat and riparian birds. Under Alternative C, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative C's direct and indirect effects of recreation management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Alternative D

Infrastructure—Direct and Indirect Effects

Many of the infrastructure-related conservation measures under Alternative D address siting and, as discussed under Alternative A, would have little bearing on riparian habitat or birds. However, Alternative D conservation measures to prohibit wind developments in PHMA, to restrict them in IHMA, and avoid them in GHMA could reduce collision hazards with migratory riparian birds or those that use upland habitats. As with Alternatives B and C, Alternative D would collocate new authorizations in or next to existing disturbances and would bury of power and communication lines. This could reduce the collision hazard of power lines, communications towers, and fences for riparian birds that use upland areas.

Unlike Alternatives B and C, Alternative D would not require using existing roads or realignments to access valid ROWs or those that are not yet developed. It would not require that new roads be built to the absolute minimum standard necessary if valid ROWs could not be accessed via existing roads. Therefore, it would be less protective than Alternative B to reduce collision hazards between riparian birds that use upland habitats and vehicle operators traveling on roads associated with infrastructure.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue, but with additional emphasis on protecting sagebrush habitat and preventing GRSG disturbance. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat, which would benefit riparian birds by preventing collisions and predator perches. Therefore, Alternative D's direct and indirect effects of infrastructure management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Fire and Fuels—Direct and Indirect Effects

Alternative D would prioritize fire suppression in PHMA and IHMA. Unlike Alternative B, it would also include the following conservation measures in PHMA, IHMA, and GHMA to strategically reduce fire effects: planning and firefighter training; designing and implementing fuels treatments with an emphasis on maintaining, protecting, and expanding GRSG habitats; and considering conifer encroachment as areas to manage wildfire for resource benefit.

Although Alternative D is similar to Alternatives B and C in prioritizing fire suppression, it would prioritize it in more GRSG habitat than Alternative B (only PHMA) and less than Alternative C (all occupied habitat). Therefore, based on suppression alone, the potential for the negative effects of suppression-related juniper encroachment on riparian birds (see Conifer

Encroachment in Alternative A) would be less under Alternative D than under Alternatives B or C. However, delineating conifer encroachment areas in PHMA, IHMA, and GHMA GRSG habitat as wildfire management areas would reduce the extent of juniper encroachment. This would protect a larger extent of riparian habitat than any of the other alternatives from the negative impacts of conifer/juniper encroachment; it would counteract at least some suppression-related conifer encroachment.

Cumulative Effects

Fire and fuels management under Alternative D would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat. Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat. Therefore, the direct and indirect effects of fire on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Under Alternative D, the direction described under Alternative A would be maintained, making it the same in terms of impacts from invasive plants and associated treatments. Similar to those of Alternative B, vegetation management conservation measures in this alternative would benefit weed control in the long term by prioritizing restoration. It would reduce, monitor, and control invasive species after construction and fuels treatments and in new range improvements. Unlike Alternative B, monitoring and controlling invasive species after fuels treatments and in new range improvements would apply to PHMA, IMHA, and GHMA, rather than only to PHMA. These policies could reduce the general impacts of invasive plants described under Alternative A on riparian habitat overlapping these areas.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. However, the additional emphasis on protecting sagebrush habitat under Alternative C would provide a net added benefit to adjacent riparian habitat. Therefore, Alternative D's direct and indirect effects of invasive plants management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment—Direct and Indirect Effects

Under Alternative D, implementing vegetation rehabilitation designed to achieve the greatest improvement in GRSG abundance and distribution, including those that address conifer encroachment, in PHMA, IHMA, and GHMA, would be prioritized. Factors contributing to

higher emphasis would include the likelihood of conifer encroachment into GRSG habitat. In addition, the vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in PHMA, IHMA, and GHMA, and to reduce the negative impacts of conifer encroachment on riparian habitat overlapping these areas, as discussed under Alternative A. Impacts from treatments associated with this alternative would be the same as those described for vegetation treatments for Invasive Plants and Fire and Fuels under Alternative A. Alternative D would address conifer encroachment more so than any of the other alternatives, so it is the most protective of riparian habitat overlapping GRSG habitat.

Cumulative Effects

Under Alternative D, in MZ IV, vegetation rehabilitation projects targeting conifer encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative D's direct and indirect effects of conifer encroachment management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Livestock Grazing—Direct and Indirect Effects

Management under Alternative D would include the same conservation measures as Alternative B, but it would expand many of those measures to PHMA, IHMA, and GHMA. It would also manage for vegetation composition (including riparian and lentic areas) and structure, consistent with appropriate GRSG seasonal habitat objectives relative to site potential. Both Alternatives D and F apply the same conservation measures as Alternative B, but Alternative B largely applies only to PHMA, whereas Alternative D applies to PHMA, IHMA, and GHMA, and Alternative F applies to all occupied habitat. Together, these efforts would reduce the potential for negative grazing-related impacts on riparian birds and habitat described under Alternative A more so than Alternatives B, or E, but less than Alternative C. Alternative D would be similar to Alternative F.

Cumulative Effects

Under Alternative D, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative D would provide an added benefit to adjacent riparian habitat. Therefore, Alternative D's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

Alternative D would close most PHMA to future fluid mineral leasing and nonenergy minerals leasing and development. It would place additional stipulations and seasonal restrictions on

existing and future fluid mineral leases in certain IHMA: leasing would be allowed, subject to standard seasonal and daily stipulations in breeding and winter habitat, and well density would not be allowed to exceed 1/640 acres; an NSO of 1.86 miles would be allowed around leks. In addition, IHMA would be closed to nonenergy minerals leasing. In GHMA, NSO would be allowed for nonenergy minerals leasing, or with 1.86 miles of PHMA and IHMA, or for future fluid mineral leasing within 1.86 miles of occupied leks. Otherwise, GHMA would be available for fluid or nonenergy minerals leasing, subject to applicable seasonal and daily timing restrictions.

Geophysical exploration would be allowed in PHMA, IHMA, and GHMA, subject to seasonal timing restrictions and other restrictions that may apply. These actions would reduce the impacts of energy development on riparian birds, discussed under Alternative A, to a level similar to that of Alternative B.

Unlike Alternative B, Alternative D directly addresses solar and wind energy development, which would not be allowed in PHMA. In IHMA, wind and solar energy development would be restricted where its adverse effects could not be mitigated. Ancillary facilities, such as roads and electric lines, could be authorized, provided mitigation prevents any net loss of GRSG habitat. GHMA would be considered avoidance areas for wind and solar development. Relative to Alternatives A and B, these actions could reduce the potential for collisions between turbines and riparian birds in habitat overlapping IHMA. But if these measures lead to the concentration of wind energy developments outside of IHMA, any net benefit to riparian birds could be eliminated.

Cumulative Effects

Under Alternative D, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat, reducing the potential for predator perches and collisions with riparian birds. Therefore, Alternative D's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation—Direct and Indirect Effects

Alternative D would apply the following conservation measures to reduce the potential negative impacts of recreation on GRSG in PHMA, IHMA, and GHMA:

- Special Recreation Permits would be analyzed on a case-by-case basis and recreation would be directed away from sensitive areas and during sensitive seasons
- Certain developed recreation sites and associated facilities would be designed or designated to direct recreation away from sensitive areas
- Seasonal restrictions for authorized activities would be incorporated

Under Alternative D, these measures could reduce the general impacts of recreation on riparian birds and habitats overlapping PHMA, IHMA, and GHNA that were described under Alternatives A and B. This alternative might have more protective benefit for riparian birds and their habitat than Alternatives A, B or C because it addresses roughly the same extent of GRSG habitat as Alternative C but includes additional conservation measures.

Cumulative Effects

Recreation management under Alternative D would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat and riparian birds. Under Alternative D, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative D's direct and indirect effects of recreation management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Alternative E1

Infrastructure—Direct and Indirect Effects

Alternative E1 is similar to Alternative B but is not as restrictive. Core habitat and IHMA would generally be identified as new ROW avoidance areas. Within core habitat, new infrastructure ROWs or SUAs would be collocated with existing infrastructure. In IHMA, new infrastructure could be built if GRSG habitat protection criteria are met. General impacts on riparian birds and riparian habitat under this alternative would be the same as those for Alternative A. Because Alternative E1 includes fewer limitations on infrastructure in GRSG habitat than Alternative B, the potential for some infrastructure-related impacts on riparian birds may be higher. Alternative E1 would reduce the likelihood of impacts from infrastructure compared to existing management under Alternative A; however, it would not be as protective of sagebrush habitat as Alternative D, which would designate PHMA, IHMA, and GHMA as new ROW avoidance areas, or Alternatives C or F, which would generally manage all occupied GRSG habitats as a new ROW exclusion areas.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat, which would benefit riparian birds by preventing collisions and predator perches. Therefore, Alternative E1's direct and indirect effects of infrastructure management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and

reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Fire and Fuels—Direct and Indirect Effects

Alternative E1 would focus resources to reduce wildfire in sagebrush areas, prioritizing fire suppression and maintaining fuel breaks in core habitat and IHMA. Fuels treatments would protect existing sagebrush ecosystems. Fire response times to core habitat and IHMA would be reduced to limit fire damage. This alternative is unique in that adaptive management would be used to account for acres of habitat lost to fire in core habitat and IHMA. These measures would reduce the threat of wildfire to riparian habitat overlapping with core habitat, IHMA, and in some cases GHMA; however, suppression-related juniper encroachment discussed in Alternative A could increase in some areas under Alternative E1. This would be offset to a certain degree, however, by restoration and vegetation management measures that prioritize the removal of conifers in core habitat and IHMA.

The general effects of fire suppression and fuels treatments under Alternative E1 would be similar to those of Alternative A. Alternative E1 would be the most beneficial in terms of protecting riparian areas overlapping GRSG habitat from wildfire, due to the combination of suppression prioritization and adaptive management measures.

Cumulative Effects

Fire and fuels management under Alternative E1 would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat. Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression would continue, but with additional emphasis on protecting sagebrush habitat during suppression. Therefore, Alternative E1's direct and indirect effects of fire on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Alternative E1 would maintain the policies described for Alternative A. It would include additional measures to protect core habitat, IHMA, and GHMA, which would be managed to prevent invasion. Invasive plants threatening GRSG habitat eradicated in core habitat and IHMA, where invasive plants would be monitored for three years following a fire. The measures under Alternative E1 would significantly reduce the impacts of invasive plants, described under Alternative A, on riparian areas overlapping core habitat, IHMH, and GHMA. Alternative E1 would be the most protective in terms of controlling invasive plants in riparian zones overlapping these areas. However, the short-term impacts on riparian habitat associated with invasive plant treatments (see Alternative A) would be the same and could affect a larger area.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue, but with additional emphasis on protecting sagebrush habitat, which would add benefit to adjacent riparian habitat. Therefore, Alternative E1's direct and indirect effects of invasive plants management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment—Direct and Indirect Effects

Alternative E1 would prioritize conifer removal in core habitat and IHMA using methods that would minimize disturbance to GRSG. Conifer encroachment projects would focus on areas with highest restoration potential (low canopy cover, existing sagebrush understory, and adjacent GRSG populations) and would not be conducted in juniper stands older than 100 years. In addition, as described above Invasive Plants, core habitat, IHMA, and GHMA would be managed to prevent invasion. Unlike Alternative D, Alternative E1 contains a specific restoration measure addressing conifer encroachment. However, Alternative D addresses conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area. Although treatments associated with these measures could negatively impact riparian habitat in the short term (refer to vegetation treatments discussion for Invasive Plants in Alternative A), they would benefit riparian habitat in the long term by reducing the negative impacts from conifer encroachment, described in Conifer Encroachment under Alternative A.

Cumulative Effects

Under Alternative E1, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments having the potential to reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E1's direct and indirect effects of conifer encroachment management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Livestock Grazing—Direct and Indirect Effects

Alternative E1 takes a very different approach to livestock grazing than the other alternatives. Management under Alternative E1 would add GRSG guidelines to grazing management plans in core habitat and IHMA. Rangeland health assessments and permit renewal assessments would be conducted in core habitat and IHMA. Allotments in core habitat that have declining GRSG populations would be prioritized, followed by allotments in IHMA that contain breeding habitats with decreasing lek counts. If assessments were to determine that livestock grazing is limiting

the achievement of desired habitat characteristics, grazing permits would be adjusted during the renewal process to achieve desired conditions. These measures could reduce the potential for degradation in areas where riparian habitat overlaps GRSG core habitat and IHMA. Relative to Alternative B, Alternative E1 focuses less management on riparian areas, meadows, and other wetlands.

Cumulative Effects

Under Alternative E1, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E1 would provide an added benefit to adjacent riparian habitat. Therefore, Alternative E1's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

Alternative E1 would follow much of the current guidance on leasing and developing mineral resources (Alternative A). But it would add measures to minimize impacts on GRSG that could also minimize impacts on riparian birds. In core habitat and IHMA, surface occupancy associated with oil and gas development would not be allowed, unless the surface development would not accelerate or cause declines in GRSG populations. Surface disturbance from roads associated with fluid mineral development would be limited to 3 percent of suitable habitat per an average of 640 acres in core habitat and 5 percent in IHMA. Wind energy project proponents would comply with all infrastructure development BMPs and the 2012 USFWS Wind Energy Guidelines. Under Alternative E1, exploration for oil and gas that uses temporary roads would be permissible if site disturbance were minimized; this could lead to vehicle collisions with riparian birds. Under Alternative E1, impacts on riparian birds and habitat from energy development would essentially continue as described in Alternative A. The effects of wind energy on riparian birds, as described in Infrastructure and Energy Development under Alternative A, would be reduced as the result on compliance with USFWS Wind Energy Guidelines.

Cumulative Effects

Under Alternative E1, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat, reducing the potential for negative impacts on riparian birds. Therefore, Alternative E1's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation—Direct and Indirect Effects

Under current management, travel on Forest Service-administered lands is limited to designated roads; thus, Alternative E1 conservation measures directed toward limiting motorized travel to designated roads, primitive roads, and trails and travel management would not be applicable. Under Alternative E1, timing and seasonal restrictions would be applied to activities known to disturb nesting GRSG. These conservation measures would have no measurable impact, either positive or negative, on riparian birds or riparian habitat.

Cumulative Effects

Management actions associated with recreation management under Alternative E1 would largely be neutral to riparian habitat and riparian birds. Therefore, Alternative E1's direct and indirect effects of recreation management on riparian birds in MZ IV would be largely neutral. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Alternative E2

Infrastructure

Alternative E2 infrastructure conservation measures addressing the siting of ROWs and SUAs and wind energy developments would benefit riparian birds by reducing the potential for collision hazards and avian predators, as discussed under Alternative A. Under Alternative E2, PHMA would be designated as avoidance areas for new ROWs and SUAs. This would be less protective of riparian birds than Alternatives B, C, or F but would be similar to Alternatives D and E1. Similar to Alternative D, Alternative E2 directly addresses siting wind energy facilities; however, Alternative E2 would be less restrictive than Alternative D. It would avoid rather than exclude siting wind energy developments in PHMA and would apply BMPs and industry, state, and federal stipulations in cases where siting in PHMA could not be avoided.

Similar to Alternative E1, Alternative E2 would not promote the undergrounding of utilities. Electrical transmission lines and, where feasible and consistent with federally required electrical separation standards, new linear transmission features would be sited in existing corridors, or at a minimum, in concert with existing linear features in GRSG habitat. Therefore, in this respect, Alternative E2 would not be as likely to prevent collisions with birds as Alternatives B, C, D, or F and would not be as protective. GRSG habitat outside PHMA would not be managed for the conservation of the species, and no specific management actions are provided for this habitat. Therefore, current trends for riparian species would likely continue outside of PHMA.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue, but with

additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Infrastructure management would focus on ROW exclusion or avoidance areas in sagebrush habitat, which would benefit riparian birds by preventing collisions and predator perches. Therefore, Alternative E2's direct and indirect effects of infrastructure management on riparian birds in MZ would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Fire and Fuels

Alternative E2 fire and fuels conservation measures with the potential to reduce the general effects of fire and fuels on riparian birds, as described under Alternative A, are the following:

- Creating and implementing a statewide fire agency agreement that would eliminate jurisdictional boundaries and allow for immediate response to natural fire in PHMA
- Focusing research efforts on effective reclamation and restoration of landscapes altered by wildfire
- Promoting efforts to reduce the size and frequency of catastrophic fires

Similar to Alternative B, Alternative E2 would consider the use of prescriptive grazing to specifically reduce fire size and intensity on all types of landownership. Overall, the protective benefits of Alternative E2 on riparian birds and habitat would likely be most similar to that of Alternative B, but Alternative E2 could also have similar negative impacts from the use of heavy equipment for suppression as those described under Alternative A: invasion of exotic plants into riparian areas that could degrade riparian areas, injure or kill eggs or chicks, or change species movement patterns or distribution of prey species due to areas devoid of vegetation.

Cumulative Effects

Fire and fuels management under Alternative E2 would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat. Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression would continue, but with additional emphasis on protecting sagebrush habitat during suppression. Therefore, Alternative E2's direct and indirect effects of fire on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Invasive Plants

Alternative E2 directs land managers to aggressively respond to new infestations to keep invasive species from spreading. Every effort would be made to identify and treat new infestations before they become larger problems. Additionally, containment of known infestations in or near sagebrush habitats would be a high priority for all land management.

Vegetation management tools described above for Fire and Fuels and below for Livestock Grazing would help to reduce the general impacts of invasive plants on riparian habitat, as described under Alternative A. Alternative E2, like Alternative E1, would be more protective during invasive plant control in riparian habitats next to sagebrush habitats than any of the other alternatives; however, the short-term negative impacts on riparian birds and habitat associated with invasive plant treatments, described under Alternative A, would be the same and could affect a larger area.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to adjacent riparian habitat. Therefore, Alternative E2's direct and indirect effects of invasive plants management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment

Alternative E2 includes a habitat restoration and vegetation management conservation measure specific to conifer encroachment that would aggressively remove encroaching conifers and other plant species to expand GRSG habitat, where possible. This would benefit riparian birds and riparian habitat by reducing the negative impacts from conifer encroachment described in Conifer Encroachment under Alternative A. In comparison, Alternative D would address conifer encroachment as part of several restoration and fire suppression conservation measures and over a larger area; this could provide a greater benefit to riparian birds and riparian habitat. In that, Alternative E2 is most similar to Alternative E1.

Cumulative Effects

Under Alternative E2, in MZ IV, vegetation management conservation measures for invasive plants and fuels treatments that could reduce juniper encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, Alternative E2's direct and indirect effects of conifer encroachment management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Livestock Grazing

Alternative E2 would continue to make GRSG PHMA and GHMA available for livestock grazing. Should site-specific concerns be raised about the effect of grazing on GRSG habitat, and such effects were documented over a sufficiently long time frame, corrective management

actions would be addressed through BMPs. Incompatible grazing strategies would be addressed through established rangeland management practices, consistent with the maintenance or enhancement of habitat. GRSG seasonal habitat (leks, nesting and early brood rearing, late brood rearing, and winter) requirements would be considered when managing sagebrush rangelands. Water developments would be designed to enhance mesic habitat for use by GRSG and to maintain adequate vegetation in wet meadows. In PHMA, GRSG stipulations would take precedence over stipulations for other species if conflicts were to occur, if otherwise allowable by law. Livestock fences would be located away from leks, and the NRCS fence standards would be used to reduce bird strikes. New infestations of invasive exotic plants would be responded to aggressively to prevent spreading. Overall, measures associated with livestock grazing under Alternative E2 would benefit riparian birds and riparian habitat, but Alternative E2 would be less protective of riparian birds and riparian habitat than Alternatives B, C, D, or F.

Cumulative Effects

Under Alternative E2, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative E2 would provide an added benefit to adjacent riparian habitat. Therefore, Alternative E2's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development

As previously discussed under Alternative A, energy development infrastructure would not be sited in or next to riparian areas; however, turbines and vehicles traveling on roads associated with energy development would pose a collision hazard to migrating riparian birds and those that also use upland habitats. Based on this rationale, the Alternative E2 conservation measure most pertinent to riparian birds would be the one designating PHMA as an avoidance area for wind energy development. Although wind energy development in PHMA would not be entirely precluded, it could prevent strikes with turbines in some areas and perhaps more than under current management.

GRSG habitat outside PHMA would not be managed for the conservation of the species. No specific management actions are provided for this habitat. Similar to Alternative E1, impacts on riparian birds from energy development activities under Alternative E2 would essentially continue as described in Alternative A, although somewhat reduced by the application of BMPs.

Cumulative Effects

Under Alternative E2, in MZ IV, some of the current energy development management would continue; however, additional emphasis on protecting sagebrush habitat would be included,

reducing the potential for predator perches and collisions with riparian birds. Therefore, Alternative E2's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. —when combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation

Alternative E2 would limit or reduce impacts from recreation by preventing new permanent disturbance, including structures, fences, and buildings, in occupied leks or within 1 mile of an occupied lek, unless it is not visible to the GRSG using the lek. It would limit disturbance outside of leks to no more than 10 db above the ambient (background) level at the edge of the lek during breeding season. Time-of-day (when the lek is active) and seasonal stipulations applying to specific habitats would be applied, based on site-specific conditions and in coordination with the local UDWR biologist.

In PHMA (nesting and brood-rearing areas, winter habitat, other habitat), disturbance would be avoided or minimized by locating development in habitat of the least importance. If avoidance were not possible, project proponents would have to explain why. Cumulative new permanent disturbance would not be allowed to exceed 5 percent of surface area, and barriers to migration, if applicable, would be avoided. These conservation measures are all very specific to sagebrush or GRSG habitat and would have no measurable impact, either positive or negative, on riparian birds or riparian habitat.

Cumulative Effects

Energy development under Alternative E2 would largely be neutral to riparian birds. Therefore, Alternative E2's direct and indirect effects on riparian birds in MZ IV would be largely neutral. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Alternative F

Infrastructure—Direct and Indirect Effects

Land uses and realty management under Alternative F would essentially be the same as that under Alternative B. The effects on riparian birds and habitat would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of infrastructure management on riparian birds and riparian habitat in MZ IV would be the same.

Fire and Fuels—Direct and Indirect Effects

Fire and fuels management under Alternative F would essentially be the same as that under Alternative B. The impacts on riparian birds and habitat would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of fire and fuels management on riparian birds and riparian habitat in MZ IV would be the same

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Invasive plants management under Alternative F would essentially be the same as that under Alternative B. Together, these measures would reduce impacts from invasive plants on riparian birds, as described under Alternative A, but the effects of the treatments would be the same.

Cumulative Effects

Refer to Alternative B. The cumulative effects of invasive plants management on riparian birds and riparian habitat in MZ IV would be the same.

Conifer Encroachment—Direct and Indirect Effects

Like Alternatives A and B, Alternative F does not directly address conifer encroachment and would maintain the invasive plant direction described under Alternative A. Although the types of impacts would be the same, the conservation measures described above in Invasive Plants and the fuels treatments described above in Fire and Fuels would likely reduce the magnitude of the impacts on riparian habitat associated with conifer encroachment, relative to Alternative A. Because those measures generally would apply throughout occupied GRSG under Alternative F, whereas they would be limited to PHMA under Alternative B, Alternative F could provide an additional reduction in the magnitude of impacts on riparian habitat from conifer encroachment.

Cumulative Effects

Refer to Alternative B. The cumulative effects of conifer encroachment management on riparian birds and riparian habitat in MZ IV would be the same.

Livestock Grazing—Direct and Indirect Effects

Alternative F would include beneficial management actions similar to those of Alternative B, except they would apply in all GRSG habitats. These are as follows:

- Completing land health assessments
- Considering grazing methods and systems to reduce impacts on GRSG habitat
- Considering retiring vacant allotments
- Improving management of riparian areas and wet meadows

- Evaluating introduced perennial grass seedings
- Authorizing new water developments and structural range improvements only when beneficial to GRSG
- Implementing BMPs for West Nile virus
- Removing, modifying, or marking fences

No new construction of water developments could benefit riparian habitat overlapping occupied GRSG habitat by preventing additional diversions from seeps or springs. Together these efforts would reduce the potential for negative impacts from grazing on GRSG described under Alternative A.

Cumulative Effects

Under Alternative F, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under Alternative F would provide an added benefit to adjacent riparian habitat. Therefore, Alternative F's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

Most of the Alternative F energy development conservation measures, with the exception of wind energy development, would likely have little bearing on riparian birds and habitat for the reasons discussed under Alternative A. Alternative F would prevent siting wind energy developments in PHMA. Outside of PHMA, wind energy would be sited at least 5 miles from active GRSG leks and at least four miles from the perimeter of GRSG winter habitat. These measures would reduce the potential for collisions between wind turbines and migrating riparian birds or those that also use upland habitats.

Cumulative Effects

Under Alternative F, in MZ IV, some of the current energy development management direction would continue, but with additional emphasis on protecting sagebrush habitat by adding all PHMA to existing closures and proposing it for withdrawal. This would reduce the potential for predator perches and collisions with riparian birds. Therefore, Alternative F's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation—Direct and Indirect Effects

Alternative F would follow the same general approach as Alternative A; however, as with Alternative B, only recreational SUAs that are neutral or beneficial to GRSG would be permitted in PHMA. In addition, in all occupied habitat, camping areas within 4 miles of active leks would be closed seasonally. The general recreational effects of Alternative F would be the same as those for Alternatives A and B, although riparian birds and habitats overlapping seasonal closure areas may derive a small added benefit.

Cumulative Effects

Recreation management under Alternative F would increase protection of sagebrush habitat, primarily in PHMA, thereby benefiting adjacent riparian habitat and riparian birds. Under Alternative F, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, Alternative F's direct and indirect effects of recreation management on riparian birds in MZ IV would be largely beneficial. —when combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Proposed Plan

Infrastructure—Direct and Indirect Effects

Many of the infrastructure-related conservation measures under the Proposed Plan address siting and, as discussed under Alternative A, would have little bearing on riparian habitat or birds. However, the Proposed Plan conservation measures that prohibit wind developments in PHMA, restrict them in IHMA, and avoid them in GHMA could reduce collision hazards with migratory riparian birds or those that use upland habitats. As with Alternatives B and C, collocating new authorizations in or next to existing disturbances and burying power and communication lines could reduce the collision hazards for riparian birds that use upland areas.

Unlike Alternatives B and C, the Proposed Plan has no provisions to use existing roads or realignments to access valid ROWs that are not yet developed or to construct new roads to the absolute minimum standard necessary if valid ROWs could not be accessed via existing roads. Therefore, it would be less protective than Alternative B in terms of its potential to reduce collision hazards between riparian birds that use upland habitats and vehicles traveling on roads associated with infrastructure.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), some of the current infrastructure management operations would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG.

Infrastructure management activities would focus on ROW exclusion or avoidance areas in sagebrush habitat, which would benefit riparian birds by preventing collisions and predator perches. Therefore, the Proposed Plan's direct and indirect effects of infrastructure management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Fire and Fuels—Direct and Indirect Effects

The Proposed Plan would prioritize fire suppression in PHMA and IHMA. Unlike Alternative B, it would also include the following conservation measures in PHMA, IHMA, and GHMA to strategically reduce fire effects:

- Planning and firefighter training in sagebrush management
- Designing and implementing fuels treatments with an emphasis on maintaining, protecting, and expanding GRSG habitats
- Considering conifer encroachment as areas to manage wildfire for resource benefit

Although the Proposed Plan is similar to Alternatives B and C in prioritizing fire suppression, it would prioritize it in more GRSG habitat than Alternative B (only PHMA) and less than Alternative C (all occupied habitat). Therefore, based on suppression alone, the potential for the negative effects of suppression-related juniper encroachment on riparian birds (see Conifer Encroachment in Alternative A) would be less under the Proposed Plan than under Alternatives B or C. However, delineating conifer encroachment areas in PHMA, IHMA, and GHMA as areas to manage wildfire for resource benefit would reduce the extent of juniper encroachment. This would protect a larger extent of riparian habitat than any of the other alternatives from the negative impacts of conifer/juniper encroachment and would counteract at least some suppression-related conifer encroachment.

Cumulative Effects

Fire and fuels management under the Proposed Plan would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat. Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), current wildfire suppression operations would continue, but with additional emphasis on protecting sagebrush habitat during suppression. Therefore, the Proposed Plan's direct and indirect effects of fire on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Invasive Plants (Annual Grasses and Other Noxious Weeds)—Direct and Indirect Effects

Under the Proposed Plan, the direction described under Alternative A would be maintained, making it the same in terms of impacts from invasive plants and associated treatments. Similar to those of Alternative B, vegetation management conservation measures in the Proposed Plan would benefit weed control in the long term by prioritizing restoration. This includes reducing invasive plants and monitoring and controlling invasive species after construction and fuels treatments and in new range improvements. Unlike Alternative B, monitoring and controlling invasive species after fuels treatments and at new range improvements would apply to PHMA, IHMA, and GHMA, rather than only PHMA. These policies could reduce the general impacts of invasive plants described under Alternative A on riparian habitat overlapping these areas.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effects section of the Draft EIS, BLM 2013), mechanical, manual, chemical, and biological control of invasive plants would continue. However, additional emphasis on protecting sagebrush habitat, under Alternative C would provide a net added benefit to adjacent riparian habitat. Therefore, the Proposed Plan's direct and indirect effects of invasive plants management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Conifer Encroachment—Direct and Indirect Effects

The Proposed Plan would prioritize implementing vegetation rehabilitation projects designed to achieve the greatest improvement in GRSG abundance and distribution, including those that address conifer encroachment, in PHMA, IHMA, and GHMA. Factors contributing to higher emphasis would include the likelihood of conifer encroachment into GRSG habitat. In addition, vegetation management tools described above for Invasive Plants and Fire and Fuels would help to reduce encroachment in PHMA, IHMA, and GHMA. This would reduce the negative impacts of conifer encroachment on riparian habitat overlapping these areas, as discussed under Alternative A. Impacts from treatments associated with this alternative would be the same as those described for vegetation treatments under Invasive Plants and Fire and Fuels for Alternative A. The Proposed Plan would address conifer encroachment more so than any of the other alternatives and, therefore, is most protective of riparian habitat overlapping GRSG habitat of any alternatives.

Cumulative Effects

Under the Proposed Plan, in MZ IV, vegetation rehabilitation projects targeting conifer encroachment would be instituted, as opposed to no specific conifer encroachment management under Alternative A. Therefore, the Proposed Plan's direct and indirect effects of conifer encroachment management on riparian birds in MZ IV would be largely beneficial. When

combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Livestock Grazing—Direct and Indirect Effects

Management under the Proposed Plan would include the same conservation measures as Alternative B, but it would expand many of those measures to PHMA, IHMA, and GHMA. It would also manage for vegetation composition (including riparian and lentic areas) and structure consistent with appropriate GRSG seasonal habitat objectives. Both Alternatives D and F apply the same conservation measures as Alternative B; however, Alternative B largely applies only to PHMA, whereas the Proposed Plan applies to PHMA, IHMA, and GHMA, and Alternative F applies to all occupied habitat. Together, these efforts would reduce the potential for negative grazing-related impacts on riparian birds and habitat described under Alternative A, more so than Alternatives B or E but less than Alternative C. The Proposed Plan would be similar to Alternative F.

Cumulative Effects

Under the Proposed Plan, in MZ IV (refer to the Cumulative Effect section of the Draft EIS, BLM 2013), livestock grazing would continue to be managed through existing grazing plans. However, additional emphasis on protecting sagebrush habitat under the Proposed Plan would provide an added benefit to adjacent riparian habitat. Therefore, the Proposed Plan's direct and indirect effects of livestock grazing on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Energy Development—Direct and Indirect Effects

The Proposed Plan would close most PHMA to future fluid mineral leasing and nonenergy minerals leasing and development. It would place additional stipulations and seasonal restrictions on existing and future fluid mineral leases in certain IHMA: leasing would be allowed subject to standard seasonal and daily stipulations in breeding and winter habitat, and well density would not be allowed to exceed 1/640 acres; NSO of 1.86 miles would be allowed around leks. In addition, IHMA would be closed to nonenergy minerals leasing. In GHMA, NSO would be allowed for nonenergy minerals leasing, or within 1.86 miles of PHMA and IHMA or for future fluid mineral leasing within 1.86 miles of occupied leks. Otherwise, GHMA would be available for fluid or nonenergy minerals leasing subject to applicable seasonal and daily timing restrictions. Geophysical exploration would be allowed in PHMA, IHMA, and GHMA, subject to seasonal timing restrictions and other restrictions that may apply. These actions would reduce the impacts of energy development on riparian birds discussed under Alternative A to a level similar to that of Alternative B.

Unlike Alternative B, the Proposed Plan directly addresses solar and wind energy development, which would not be allowed in PHMA. In IHMA, wind and solar energy development would be restricted where adverse effects could not be mitigated. Ancillary facilities, such as roads and electric lines, could be authorized, provided mitigation prevents any net loss of GRSG habitat. GHMA would be considered avoidance for wind and solar development. Relative to Alternatives A and B, these actions could reduce the potential for collisions between turbines and riparian birds in habitat overlapping IHMA. But if these measures were to concentrate wind energy developments outside of IHMA, any net benefit to riparian birds could be eliminated.

Cumulative Effects

Under the Proposed Plan, in MZ IV, some of the current energy development management direction would continue; however, additional emphasis on protecting sagebrush habitat would be included, reducing the potential for predator perches and collisions with riparian birds. Therefore, the Proposed Plan's direct and indirect effects on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

Recreation—Direct and Indirect Effects

The Proposed Plan would apply the following conservation measures to reduce the potential negative impacts of recreation on GRSG in PHMA, IHMA, and GHMA:

- Special Recreation Permits would be analyzed on a case-by-case basis and recreation would be directed away during sensitive seasons or in sensitive areas
- Certain developed recreation sites and associated facilities would be designed or designated to direct recreation away from sensitive areas
- Seasonal restrictions for authorized activities would be incorporated

Under the Proposed Plan, these measures could reduce the general impacts of recreation on riparian birds and habitats overlapping PHMA, IHMA, and GHMA, described under Alternatives A and B. The Proposed Plan might have an extra protective benefit to riparian birds and their habitat over Alternatives A, B, or C because it addresses roughly the same extent of GRSG habitat as Alternative C but includes additional conservation measures.

Cumulative Effects

Recreation management under the Proposed Plan would increase protection of sagebrush habitat, thereby benefiting adjacent riparian habitat and riparian birds. Under the Proposed Plan, in MZ IV, some of the current recreation management direction would continue, but with additional emphasis on protecting sagebrush habitat and preventing disturbance to GRSG. Therefore, the Proposed Plan's direct and indirect effects of recreation management on riparian birds in MZ IV would be largely beneficial. When combined with the past, present, and reasonably foreseeable future actions, it would not substantially increase impacts on riparian birds or riparian habitat.

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