Utah Greater Sage-Grouse

Proposed Land Use Plan Amendment and Final Environmental Impact Statement

Volume III: Chapters 4 (continued) - 6, References, Glossary, and Index

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UTAH GREATER SAGE-GROUSE PROPOSED LAND USE PLAN AMENDMENT AND FINAL ENVIRONMENTAL IMPACT STATEMENT

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACEC	area of critical environmental concern
AML	appropriate management level
APD	application for permit to drill
AUM	animal unit month
BER	Baseline Environmental Report
BLM	United States Department of the Interior, Bureau of Land Management
BMP	best management practice
BSU	biologically significant unit
°C	degrees Celsius
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COA	condition of approval
COT report	Conservation Objectives Report
CSU	controlled surface use
DOI	United States Department of the Interior
EIS	environmental impact statement
EPA	Environmental Protection Agency
ERMA	extensive recreation management area
ESA	Endangered Species Act of 1973
ESD	ecological site description
°F	degrees Fahrenheit
FIAT	fire and invasives assessment tool
FLPMA	Federal Land Policy and Management Act of 1976
Forest Service	United States Department of Agriculture, Forest Service
FRCC	fire regime condition class
GHMA	general habitat management area
GIS	geographic information systems
GRSG	Greater Sage-Grouse
HMA	herd management area
IM	Instruction Memorandum
kV	kilovolt
LRMP	land and resource management plan
LUP	land use plan
LUPA	land use plan amendment
MZ	Management Zone
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969

NFMA	National Forest Management Act of 1976
NOI	notice of intent
NRCS	United States Department of Agriculture, Natural Resources Conservation Service
NSO	no surface occupancy
NTT	Greater Sage-Grouse National Technical Team
OHV	off-highway vehicle
PAC	priority area for conservation
PM2.5	particulate matter with a diameter less than or equal to 2.5 microns
PM10	particulate matter with a diameter less than or equal to 10 microns
PHMA	priority habitat management area
RDF	required design feature
RFD	reasonably foreseeable development
RMP	resource management plan
ROD	record of decision
ROW	right-of-way
SFA	sagebrush focal area
SGIT	Sage-Grouse Implementation Team
SGMA	Sage-Grouse Management Area
SITLA	State of Utah School and Institutional Trust Lands Administration
SRMA	special recreation management area
SRP	special recreation permit
SUA	special use authorization
SUP	special use permit
TL	timing limitation
UDWR	Utah Division of Wildlife Resources
US	United States
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Department of the Interior, Fish and Wildlife Service
USGS	United States Geological Survey
VDDT	Vegetation Dynamics Development Tool
VRM	visual resource management
WAFWA	Western Association of Fish and Wildlife Agencies
WGFD	Wyoming Game and Fish Department
WSA	wilderness study area

Chapter 4
Environmental Consequences
continued

4.16 LIVESTOCK GRAZING/RANGE MANAGEMENT

4.16.1 Methods and Assumptions

Indicators

Indicators of impacts on range management are as follows:

- Changes in permitted AUMs in areas available for livestock grazing
- Changes in the type of livestock permitted on allotments
- Prohibitions or limitations of the construction or maintenance of structural and nonstructural range improvements
- Modifications to or removal of structural range improvements
- Making areas unavailable for livestock grazing for the life of the LUP
- Changes to the timing, duration, or frequency of permitted use, including temporary closures

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Changes in seasons in use would not necessarily result in a reduction in AUMs because grazing could occur during other times of the year at the same level.
- All new and renewed leases and permits would be subject to terms and conditions determined by the Authorized Officer to achieve the management and resource condition objectives for public lands and to meet BLM Utah Public Land Health Standards and desired conditions on National Forest System lands.
- Range improvements (e.g., fences, pipeline, water wells, troughs, and reservoirs) could create a localized loss of vegetation cover throughout the improvements' useful life. Vegetation would be reestablished through reclamation practices along water pipelines and naturally along fence lines within 5 years to the extent possible, whereas a portion of the disturbed areas with water wells, troughs, and reservoirs could remain disturbed during their useful life and would be revegetated only if abandoned.
- The construction and maintenance of range improvements would continue in the decision area as needed. New range improvements would be subject to limitations, as defined in the LUP. Range improvements are generally intended to better livestock distribution and management, which would maintain or improve rangeland health and could benefit the forage base and wildlife and GRSG habitat.
- By definition in this LUPA, livestock grazing is not considered a surface-disturbing activity, but it could affect the surface in areas where livestock concentrate, such as around range improvements.

4.16.2 Alternative A

No PHMA or GHMA is designated for GRSG under this alternative. In general, Alternative A would be the least restrictive on resource uses, including livestock grazing. As a result, grazing permittees would continue to manage their grazing operations under the current management. This alternative would also be the least restrictive for other resource uses and associated development; therefore, there is an increased chance of disturbance from mineral development, recreation, and other uses on livestock grazing operations.

Greater Sage-Grouse Management

In general, management actions to protect GRSG involve limiting surface disturbance and fragmentation of habitat from other land uses. Such actions are likely to decrease disturbance on livestock grazing from other land use activities. Restrictions on surface disturbances may also limit construction of rangeland improvements by limiting livestock grazing management options and livestock use opportunities.

Under Alternative A, special provisions for GRSG protection are limited. There are few direct limitations on resource uses specifically for GRSG protection. A few LUPs (e.g., Vernal RMP and Uinta LRMP) include detailed habitat objectives for GRSG habitat, which could impact suitability of lands for livestock grazing, but such provisions are not present in most LUPs. There is also limited potential for site-specific restrictions on range management because of measures to protect, maintain, and enhance special status species habitat. In addition, many LUPs contain management actions to prohibit surface-disturbing or other disruptive activities within GRSG breeding and nesting habitat and, in some cases, winter habitat, within a certain distance and between certain dates. The level of impacts on grazing management would depend on site-specific restrictions in place under current LUPs, but is likely to be lower under Alternative A than all other alternatives.

Vegetation Management and Fire (including invasive plants and juniper encroachment)

Vegetation Management

Vegetation management could directly affect livestock grazing if management requires limitations on available grazing acreage or changes to permitted AUMs, grazing strategies, or season of use, which could result in increased cost to permittees.

Under Alternative A, there would be some vegetation management actions specifically for GRSG habitat enhancement in individual RMPs. These actions could require adjustment to livestock grazing management. GRSG-specific management actions for vegetation would not, however, be consistent across the planning area. Vegetation could be managed to improve forage, and impacts on range management would be minimal. Management actions for invasive species would continue under the direction of current LUPs with the focus on areas not meeting land health standards. Under Alternative A, no priorities are established specific to the improvement of GRSG habitat, but rather, prioritization is given to projects that benefit multiple resources; therefore, restoration activities may result in short-term limits on grazing but could improve forage for multiple resource uses in the long term, including livestock grazing.

Wildland Fire Management

Wildland fire alters sagebrush habitat due to the long time required for sagebrush to regenerate, which may allow for invasion of invasive species (NTT 2011). Wildland fire would remove livestock forage over the short term but can result in forage increases post-fire.

Prescribed burn areas could temporarily reduce available forage in the short term but improve conditions in the long term.

Impacts on livestock operations could also occur when a rest period is required following rehabilitation before grazing resumes and could impact ability of permittees to fully use permitted AUMs.

Under Alterative A, mechanical treatments, prescribed fires, and other treatments would be used to prevent conifer encroachment and remove undesirable annual grass and weed species. These actions could improve forage in the long term. A minimum rest period from livestock grazing of two growing seasons would be required on BLM-administered lands after seeding post any major vegetative disturbance, including wildfire. On National Forest System lands, rest recovery period would be site-specific and based on recovery. For all lands, specific timing and the type of rest, as well as any modification needed to livestock grazing use, would be determined at the site-specific environmental assessment phase. As a result, livestock grazing would be excluded from areas following a fire; impacts on and costs and time for permittees would depend on the fire location relative to grazing allotments.

Livestock Grazing and Wild Horses and Burros

Changes in livestock grazing management could impact grazing opportunities in a variety of ways. For example, implementing particular livestock grazing management requirements to benefit GRSG could affect livestock grazing by increasing operators' costs or changing required management actions. Some management requirements could result in short- and long-term cost increases to permittees, or AUMs could decrease for some permittees due to the following:

- Implementation of a grazing strategy
- Change in season-of-use or livestock class
- Modification to grazing systems
- Construction, modification, or removal of range improvements
- Requirements for lighter levels of use than historically provided

These management requirements could result in direct and indirect economic impacts on individuals and the community at large. For example, if a ranch is dependent seasonally on federal forage, a reduction or eliminations of federal AUMs could create forage imbalances that produce a greater reduction in grazing capacity than just the loss of federal AUMs (Torell et al. 2002).

Some management changes may require a short-term cost output for permittees but would result in long-term benefits. For example, construction of range improvements to improve livestock distribution and allow use of a larger portion of the rangeland would generally enhance

rangeland health and provide additional forage in the long term; however, it would have short-term costs. Constructing off-site water sources and fencing riparian and spring sources could keep livestock away from sensitive riparian areas and provide a cleaner, more-reliable source of water for livestock, but would similarly represent an increased cost for permittees.

Under Alternative A, 329,521 AUMs would be permitted on BLM-administered lands and 265,373 AUMs on National Forest System lands, although site-specific temporary changes to use of AUMs may occur. All permits under Alternative A on BLM-administered lands would continue to be required to meet or make progress toward meeting BLM Utah's rangeland health standards. Evaluations of achievement or significant progress towards achievement would continue to occur. Modifications to grazing permits, including grazing systems, permitted AUMs, allotment boundaries, etc. would be made as needed to conform to the Standards and Guidelines for Livestock Grazing Management if grazing has been determined to be the causal factor for non-achievement of a standard, as required by BLM grazing regulations. As a result, any changes to grazing management would occur on a rolling basis at the time of the determination.

Lands would be managed to maintain and restore healthy native desired plant and animal species, and changes to rangeland management would be directed first to allotments identified as not meeting achieving land health standards during permit renewal. Similarly, the focus in riparian areas and wetlands would be to manage, maintain, protect, and restore riparian areas and wetlands towards proper functioning condition. As described above, managing riparian habitat can directly impact livestock grazing through excluding livestock at specific sites, increasing herding, and adding range improvements (such as cross fences, water gaps, and off site waters). Such changes in grazing management options could result in increased time or costs for permittees.

Measures for GRSG and other sensitive species habitat under Alternative A are limited to requirements for, "maintenance of desired species including native, threatened, endangered, and special status species at a level appropriate for the site and species." This alternative would not direct the BLM or Forest Service to manage certain areas more intensively for GRSG habitat objectives; therefore, impacts on grazing in GRSG habitat would be similar to those throughout the planning area.

In general, structural range improvement construction and modification, including fences and water developments and vegetation treatments to improve forage, would be allowed in the decision area when needed to support grazing systems or improve livestock distribution on a case-by-case basis, providing increased options for livestock management for the BLM and Forest Service and the permittees. Fences would be constructed to protect and benefit livestock and wildlife, but no specific provision are included for GRSG, so additional costs could be limited.

Travel and Transportation

Limits on construction or use of transportation routes could affect livestock grazing practices. Road construction could cause loss of forage, harassment, and displacement; thus, reduction of these activities may benefit livestock by reducing disturbances. Closing roads or trails not leading to range improvements would also increase forage availability when the area is

rehabilitated or when natural rehabilitation occurs. As discussed further under *Other Actions* (recreation), below, there is potential for conflicts between recreational use and livestock grazing to occur, particularly in areas open to cross-country travel. Limitations on cross-country travel, however, could impact permittees' ability to effectively manage livestock if exemptions are not granted for allotment access.

Under Alternative A, conflicts are most likely to occur between livestock grazing and OHV use in the 797,000 acres of the decision area open to cross-county travel and to some extent on the 437,400 acres limited to existing routes. Access to allotments would be maintained. OHV use on National Forest System lands is limited to roads, trails, and areas that have been designated through a transportation planning process and, therefore, impacts on livestock disturbance or allotment access from travel management would be the same across all alternatives on National Forest System lands.

Infrastructure Development (including all ROWs and utility corridors)

Restrictions on ROWs, particularly ROW exclusion areas, may indirectly impact grazing by reducing construction impacts from development of these ROWs (such as dust reducing forage palatability, harassment or displacement of livestock, and introduction of noxious weeds). In all cases, impacts would be concentrated on areas where restrictions on development overlap with areas available for livestock grazing.

Under Alternative A, approximately 27,600 acres within mapped GRSG habitat are classified as ROW exclusion areas for new ROW development. Outside of mapped occupied habitat in population areas, there are an additional 74,900 acres of ROW exclusion areas. Indirect impacts on livestock from development would be reduced where areas available for livestock grazing overlap these ROW exclusion areas. Some additional limitations on disturbance from development could occur in ROW avoidance areas.

Mineral Development (including geothermal)

During the exploration and testing phase of mineral development, the footprint of disturbance is usually small and localized; therefore, minimal acres available for grazing would be directly impacted. However, during the exploration phase, impacts on livestock dispersal and trespass could occur, increasing time and cost to permittees. Outside of the exploration and testing phase, surface-disturbing mineral development directly affects areas of grazing in the short term during construction of well pads, roads, pipelines, and other facilities. Potential impacts include changes in available forage, reduced forage palatability because of dust on vegetation, limits on livestock movement, harassment, temporary displacement of livestock, and an increased potential for the introduction and proliferation of noxious weeds that lack the nutritional value needed for productive grazing practices. In the long term, a smaller amount of grazing acreage is permanently lost from mining operations following rehabilitation. Improving roads associated with mineral development could facilitate livestock management operations by maintaining or improving access to remote locations within allotments. Properly implemented BMPs and reclamation mitigation measures would likely maintain rangeland health and forage levels for livestock. Management for energy and mineral development on split-estate lands would not impact BLM permittees; however, impacts could occur to livestock grazing on National Forest System lands, as well as private, state, or other lands.

In general, Alternative A is the least restrictive on energy and mineral development of all the alternatives (**Table 2.3**). As a result, the indirect impacts of development on livestock grazing, including spread of noxious weeds and disturbance of livestock, would be the greatest under this alternative.

Other Actions

Recreation can affect livestock grazing directly through human disturbance and indirectly through rangeland habitat degradation. Direct disturbance can include undesired animal dispersing or trespassing due to gates left open by recreational users; animal displacement, harassment, or injury from collisions or shooting; or damage to range improvements, particularly from recreational vehicle use or from recreational shooting. Disturbance could occur during the hunting seasons due to increased presence of people, vehicles, and noise and livestock shooting. In addition, OHV use causes indirect impacts, such as increased dust on forage in high-use areas, leading to lower forage palatability.

Other direct long-term recreation impacts include disturbance caused by increased levels of human activities. The degree of impacts would vary with the intensity of recreation (such as, large numbers of people for SRP use would likely have a higher level of disturbance, as compared to frequent use by a small number of visitors), the timing of recreation activities (livestock could be more susceptible to disturbance during the spring when young are present), and location of recreation in the allotment (a higher level of disturbance could occur near areas frequented by livestock such as water sources or salt licks).

Under Alternative A, there would be no new restrictions to SRPs in the decision area; therefore, livestock could be disturbed by recreational activities or groups in the planning area. Some limited potential for disturbance from general recreational activities is possible, as described above.

4.16.3 Alternative B

Mapped occupied GRSG habitat would be designated as PHMA and GHMA under this alternative, and impacts would primarily occur to range management in PHMA due to restrictions on resource uses.

Greater Sage-Grouse Management

Management actions designed to enhance GRSG habitat could affect livestock grazing by restricting grazing intensity, changing season of use, or requiring more intensive and costly management practices, in order to maintain residual herbaceous cover in sagebrush habitat (NTT 2011). Management of vegetation to benefit GRSG, could, however, indirectly benefit livestock grazing by increasing vegetation productivity and improving forage in the long term (especially in cases where current conditions are not meeting or exceeding land health standards). For example, in allotments with a history of intensive grazing, transitions in sagebrush community composition may have occurred that have reduced cover or forage for GRSG (Cagney et al. 2010) and grazing livestock.

Under Alternative B, PHMA and GHMA would be designated in the planning area, and measures would be put into place to manage or restore PHMA so that at least 70 percent of the land cover provides adequate sagebrush habitat to meet GRSG needs. Where cover requirements do

not meet forage objectives for livestock grazing, this would result in the need to modify grazing practices with increased costs for permittees. Management of PHMA so that discrete anthropogenic disturbances cover less than 3 percent of the total GRSG habitat would result in decreased indirect disturbance on livestock grazing from other land uses such as mineral development and roads as compared with Alternative A. The ability to construct range improvements could be limited in some instances by these requirements. Reduction of disturbance could also indirectly affect livestock management maintaining or improving forage production, vegetation productivity, riparian resources, and decreasing soil disturbance, thereby maintaining or improving overall rangeland conditions.

Vegetation Management and Fire (including invasive plants and juniper encroachment)

Vegetation Management

Under Alternative B, meeting GRSG habitat objectives within PHMA would be the highest restoration priority. In addition, implementation of restoration projects would be based on seasonal habitats that are thought to be limiting GRSG distribution and/or abundance. Post-restoration management to ensure long-term persistence could include changes in livestock grazing management to achieve and maintain the desired conditions. As a result, limitations on livestock grazing management as a result of vegetation management could occur in PHMA, particularly in important seasonal habitats and in areas post-restoration. Management actions for invasive species would continue under the direction of Integrative Vegetation management directives, with limited impacts on livestock grazing.

Wildland Fire Management

Overall, changes in wildland fire suppression and fuels management to protect GRSG habitat would have varying effects on livestock grazing. Measures to protect sagebrush habitat could reduce the spread of wildland fire and the associated disruption to livestock. If grazing allotments are allowed to burn because they are not priority suppression areas, it could result in a reduction in available forage in the short term.

Use of livestock to aid in thinning fine fuels could provide some increased opportunities for grazing at a site-specific scale. This would likely involve high-intensity, short-duration grazing in the late fall or early spring/late winter to target cheatgrass and would involve intensive management such as increased herding and temporary fencing in order to concentrate livestock in the desired area. As a result, management costs and time would be high and may result in reduced livestock productivity.

Under Alternative B, fuels treatments and fire suppression in PHMA would be prioritized, with the focus on GRSG habitat protection. As a result, there is potential for fewer disturbances to grazing with fewer wildland fires in the long term.

Management actions to restore PHMA post-fire could result in impacts on range management; under Alternative B, management activities could be adjusted to support restoration/post-rehabilitation efforts. This adjustment could result in a temporary grazing reduction in areas of post-fire rehabilitation. The level of impacts would depend on size, location, and intensity of fire and related level of restoration needed. Upon successful rehabilitation, the temporary reductions could be re-authorized

Livestock Grazing and Wild Horses and Burros

Under Alternative B, acres available for livestock grazing and permitted AUMs would be the same as Alternative A. Consideration of GRSG habitat objectives and management would be required in grazing management in PHMA and incorporated into all grazing allotments through allotment management plans or their equivalent, permit renewal terms or conditions, or Forest Service NEPA processes. As a result, impacts described below would occur over time at a site-specific level as measures are incorporated into individual allotments. Land health assessment and permit renewals would be prioritized in PHMA; therefore, there is potential for further degradation of lands outside of PHMA in the decision area.

Modifying LUP decisions to make PHMA unavailable for livestock use would result in potential reductions in AUMs in the planning area in the long term. Compensation for permittee-constructed authorized range improvements would be provided as appropriate for BLM permittees based on requirements in 43 CFR 4120.3-6(c) and in certain limited circumstances for Forest Service permittees per 36 CFR 222.6 (a).

Under Alternative B, vegetation treatments that benefit livestock forage could only be completed if these treatments would also conserve, enhance, or improve GRSG habitat; therefore, the management options for livestock grazing in PHMA could be reduced. Land health assessments using ESDs would be required to evaluate if standards for rangeland health, as well as GRSG habitat objectives, were being met, with potential modifications to grazing management required if allotments were found to not be meeting standards or objectives, resulting in increased time and costs for permittees.

Managing riparian habitat can directly impact livestock grazing by excluding livestock at specific sites, increasing herding, adding range improvements (such as cross fences, off-site waters, and water gaps), and adjusting season of use and livestock numbers. As in Alternative A, managing riparian habitat to maintain proper functioning condition would benefit grazing livestock by indirectly providing cleaner, more-reliable water sources and more-dependable forage availability.

Protecting water quality and watershed health could require changes in livestock management, such as deferring or shortening grazing periods, adding range improvements, excluding grazing from riparian areas, establishing riparian pastures, and increasing livestock herding. In areas requiring exclusion of livestock or other restrictions on livestock management, these limitations could result in increased costs to permittees if changes resulted in AUM reduction or increased livestock management costs. Increased range improvement maintenance would also add to operating costs and decrease permittee profitability.

Under Alternative B, similar to Alternative A, riparian areas would be managed for proper functioning condition or similar standards at a minimum with increased emphasis in PHMA, with potential limitations on grazing within these areas or increased use of fencing/herding, seasonal limitations on grazing, or creation of water developments or other measures to manage distribution of livestock. These measures could result in increased permittee cost or time. In both PHMA and GHMA, additional measures would be implemented to conserve and enhance wet meadows, also with potential for increased permittee time and cost in these areas.

In the long term, livestock grazing in PHMA could be reduced under Alternative B in order to conform to GRSG habitat guidelines identified by Connelly et al. (2000) and Hagen et al. (2007); timing and degree of reduction would depend on permit renewal timing and site-specific conditions.

Structural range improvements (e.g., fences) in PHMA under Alternative B would be allowed, but would be developed to conserve, enhance, or restore GRSG habitat. In addition, some fences would require marking to lessen the risk of GRSG impacts; therefore, the cost of building or maintaining these structures could be increased compared with Alternative A.

Similarly, new water developments from spring or seep source diversions would only be permitted when GRSG habitat would also benefit and, therefore, would be limited. Consequently, permittees could have increased management costs, and AUMs could require reduction if water is limited on a given allotment. Overall, water improvements and fences would likely be removed or modified to some extent in Alternative B, which would result in decreased grazing or shifts in grazing use patterns in the long term.

Travel and Transportation

Travel management actions for GRSG protection generally involve increased limitations or restrictions on travel management. As described under Alternative A, limitations on travel management could result in decreased disturbance to livestock but could also limit the ability of permittees to access livestock for management. Under Alternative B, 34,600 acres of the decision area would be open to cross-country use (a 95 percent decrease from Alternative A), with a related increase in areas limited to existing routes (1,213,500 acres, a 270-percent increase from Alternative A). Additionally, in PHMA, OHV travel would be limited to existing roads, primitive roads, and trails until travel management planning is complete and the need for additional closures evaluated. As a result, disturbance to livestock is likely to be reduced, particularly in PHMA. Access to livestock and structural range improvements is not likely to be impacted by the creation of activity-based plans under Alternative B.

Infrastructure Development (including all ROWs and utility corridors)

Lands and realty actions to protect GRSG habitat would generally involve ROW avoidance or exclusion areas (e.g., for power lines, pipelines, and other structures) or land transfers in GRSG habitat and could result in a slight decrease in disturbance in these areas.

Under Alternative B, all PHMA, approximately 2,784,200 acres within mapped occupied GRSG habitat, would be ROW exclusion (100 times more than Alternative A). Impacts would be the same as those discussed in Alternative A; however, the overall potential for disturbance would be decreased due to the larger exclusion area. Outside of occupied GRSG habitat in population areas, ROW exclusion and avoidance areas would be the same as under Alternative A.

Mineral Development (including geothermal)

Under Alternative B, additional restrictions would be placed on mineral development as compared with Alternative A; lands in PHMA would be recommended for withdrawal from mineral entry for locatable minerals, closed to mineral materials removal, and closed to new leasing for fluid minerals. For currently leased parcels, NSO stipulations would be applied in

PHMA. As a result, indirect disturbance of livestock from mineral development would be minimized in PHMA.

Other Actions

As discussed under Alternative A, limitations on recreational use in GRSG habitat in PHMA could indirectly benefit livestock by reducing direct disturbance. Limiting use could also reduce the likelihood of livestock dispersing into unauthorized areas through gates being left open.

4.16.4 Alternative C

Alternative C would be the most restrictive of grazing management; no livestock grazing would be authorized in mapped occupied GRSG habitat under Alternative C1, and livestock grazing would be reduced in Alternative C2. Activities for all other resource uses would also be restricted under this alternative; however, impacts of all other resources and resource uses on livestock grazing under Alternative C would be limited due to reduced permitted grazing under this alternative.

Greater Sage-Grouse Management

Under Alternative C, all mapped occupied GRSG habitat would be classified as PHMA and would be unavailable for livestock grazing in Alternative C1 and would have permitted grazing reduced in Alternative C2.

Objectives would include the restoration and maintenance of the sagebrush steppe to its ecological potential in PHMA. These objectives could impact livestock grazing management where these objectives are not consistent with livestock forage requirements. Due to the exclusion of grazing in PHMA under Alternative C1 and the reduction of grazing in Alternative C2, no impacts would occur in Alternative C1, and impacts from GRSG management on livestock grazing would be limited in Alternative C2.

Limitation on surface disturbance in PHMA to one instance per section of GRSG habitat regardless of ownership, with no more than 3 percent surface disturbance, could result in indirect impacts by limiting disturbance to livestock grazing from other land uses such as mineral development and road construction, as compared with Alternative A. However, due to the exclusion of grazing under Alternative C1 and reduction of grazing in Alternative C2, there would be negligible impacts from this management action.

In contrast to other alternatives, the disturbance cap in Alternative C could result in direct impacts on livestock grazing at a site-specific level, as it does apply to "heavily grazed areas." However, due to the exclusion of grazing in Alternative C1 and reduction in grazing in Alternative C2, the likelihood of incurring heavily grazed areas under this alternative would be low, even on a site-specific level; therefore, impacts on grazing management would be limited.

Due to other management actions limiting the construction of range improvements under Alternative C and elimination (Alternative C1) or reduction (Alternative C2) in grazing under this alternative, the disturbance cap is not likely to impact the ability of permittees to construct structural range improvements or distribute livestock.

Under Alternative C, a portion of mapped occupied habitat would be closed to OHV travel. While it is assumed that routes used by permittees would remain available for administrative access, it is possible that there would be reduced access under Alternative C2.

Vegetation Management and Fire (including invasive plants and juniper encroachment)

Vegetation Management
Under Alternative C, prioritization of areas for restoration and vegetation management actions would be similar to those discussed in Alternative B. Impacts on livestock grazing management would be limited due to no authorized grazing under Alternative C1 and reduced grazing under Alternative C2.

Wildland Fire Management
Under Alternative C, management priorities and impacts would be similar to those described in Alternative B. Due to no authorized grazing under Alternative C1 and reduced grazing under Alternative C2, impacts from wildland fire management on livestock grazing would be limited.

Livestock Grazing and Wild Horses and Burros

Alternative C1
Alternative C1 would remove livestock grazing from all allotments totally in or partially within mapped occupied GRSG habitat following a 2-year notice to cancel existing permits. In the planning area overall, this represents a 100-percent reduction in AUMs compared with Alternative A. Removal of grazing from all allotments intersecting mapped occupied habitat would result in economic impacts on permittees. As discussed under Alternatives A and B, permittees would be faced with reducing AUMs for their operations or locating replacement forage, often at higher costs than that currently obtained from federal lands and with limited availability. Changes to permitted AUM levels could also impact property values of ranches adjacent to federal lands. Closures would also impact permittees' current seasonal rotations or other management strategies that use both federal and private lands.

Due to these factors, the elimination of permitted grazing in PHMA could result in permittees going out of business. Loss of business could impact both individual permittees and local communities as a whole, and could result in the sale or transfer of private grazing lands, and subsequent development of these lands for other uses. Details of the social and economic impacts are discussed in **Section 4.23**, Social and Economic Impacts (Including Environmental Justice).

No specific management actions related to range infrastructure are in place under Alternative C1 due to the lack of permitted grazing. It is unclear whether a concerted effort to remove any or all livestock management infrastructure would occur. In areas made unavailable for grazing, any maintenance requirements for remaining infrastructure and associated costs would likely fall to the BLM and Forest Service to complete. Permittees who have investments on federal lands in mapped occupied habitat that would be impacted would receive compensation as appropriate based on federal regulations in 43 CFR 4120.3-6(c) and 36 CFR 222.6 (a). The BLM's and Forest Service's funds or other investments towards the construction of range infrastructure could also be impacted. Furthermore, fencing could be required to avoid trespass of livestock onto lands

where grazing is excluded, representing potential additional costs for permittees. Increased time or costs could be substantial in areas with checkerboard land ownership, where public land is interspersed with private or state land.

Lack of ability to use range improvements and water developments on occupied habitat could result in other indirect costs. Permittees who currently rotate pastures between private and federal lands could need to construct additional water developments or other structural range improvements on private pastures, resulting in increased time and costs.

As a result of removal of grazing from mapped occupied habitat, there is also the potential for increased conflicts between grazing and other resources and resource uses on lands of other surface ownership should livestock grazing increase in areas outside of occupied habitat.

Alternative C2

Under Alternative C2, livestock grazing would be significantly reduced in the decision area, with 197,713 AUMs on BLM-administered lands and 159,224 AUMs on National Forest System lands (an approximate 52-percent and 40-percent reduction, respectively, compared with Alternative A). Site-specific closure of allotments would be determined when an allotment is analyzed, as described in Alternative B, above. Impacts of closing allotments would be similar to those described in Alternative C1.

In areas where grazing would still be permitted, management would be similar to that described in Alternative B, with the addition of other protective measures for GRSG habitat (such as prohibition of grazing during the growing season). As a result, time and costs for permittees would be substantially increased as compared with Alternative A.

Existing structural range improvements under Alternative C2 could require modifications or removal when determined to have a high risk of GRSG strike. In addition, management actions would allow no new water developments and could require dismantling existing developments. Other structural range improvements would be permitted only when shown in peer-reviewed studies to be beneficial to GRSG, and, therefore, few are likely to be permitted. The modification of range improvements would represent direct increased costs to permittees. Modification and removal of existing improvements and prohibitions on new improvements could also limit ability to effectively distribute livestock, resulting in inability to improve range conditions and potential for indirect increases in time and costs for permittees. As discussed under Alternative C1, loss of use of range improvements in areas made unavailable for livestock grazing also has the potential to result in direct and indirect costs. As under Alternative C1, fencing could be required to avoid trespass of livestock onto lands where grazing is excluded, representing potential additional costs for permittees. Increased time or costs could be substantial in areas with checkerboard land ownership, where public land is interspersed with private or state land.

Wild horse AMLs would be reduced by 25 percent in HMAs that are entirely or partially within PHMA under Alternative C2. This reduction could decrease competition for forage in these areas.

Travel and Transportation

Under Alternative C, the nature and type of impacts would be as described under Alternatives A and B. Under Alternative C, no areas would be available for cross-county travel (a 100-percent reduction in the decision area compared with Alternative A), and areas limited to existing or designated routes would increase (1,943,700 acres, 17 percent more acres than under Alternative A). As under Alternative B, additional limitations for OHV travel would apply in PHMA. Additionally, new road construction would be prohibited. Alternative C would close existing routes on 555,700 acres. This closure would reduce conflicts between recreation and livestock grazing. Permittees would be allowed to use existing routes within these areas to access range improvements. Under Alternative C1, however, impacts on livestock grazing would not occur due to PHMA being unavailable for livestock grazing. Under Alternative C2, impacts would occur on the limited allotments available for grazing under this reduced grazing Alternative. Prohibition of new roads could limit long-term disturbance of livestock from vehicles but could also impact the ability to access allotments for management as compared to Alternative A.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative C, ROWs would be excluded on all 3,313,800 acres of mapped GRSG occupied habitat. Due to the exclusion of grazing from PHMA under Alternative C1, however, the lack of disturbance in this area would not impact livestock management. Under Alternative C2, impacts would occur in areas that remained available for livestock grazing. In population areas outside of occupied habitat, there would be some potential for decreased disturbance due to management actions limiting development in this area.

Mineral Development (including geothermal)

Under Alternative C, additional restrictions would be applied to mineral and energy development (**Table 2.3**). No impacts would occur from energy and mineral development on livestock grazing under Alternative C1 due to the exclusion of grazing from PHMA. Under Alternative C2, energy and mineral management actions would result in decreased disturbance and increased forage production for areas remaining available for grazing.

Other Actions

Under Alternative C, SRPs in PHMA would be restricted when they were found to have negative impacts on GRSG, as described in Alternative B; no impacts would occur under Alternative C1 due to the exclusion of grazing from PHMA, and impacts would be limited under Alternative C2 due to reduced grazing.

4.16.5 Alternative D

Alternative D management actions and related impacts would be similar to those described in Alternative B; however, many grazing management actions would be determined at the BLM District or Forest Service unit level in order to emphasize management appropriate for local vegetation communities and GRSG habitats, rather than at the planning-unit scale. As a result, impacts on range management would vary at a site-specific level.

Greater Sage-Grouse Management

Under Alternative D, PHMA and GHMA would be designated in the planning area. Objectives for sagebrush, grasses, and forbs would follow habitat guidelines from scientific literature based

on documented regional variation. As a result, the nature and type of impacts on livestock management would be similar to those described under Alternative B, but could be reduced in intensity due to the ability to take into account region-specific habitat limitations to meeting these objectives.

In addition, disturbance in PHMA would be limited to less than 5 percent of the area within PHMA used by a population of GRSG, regardless of ownership. As a result, indirect disturbance of livestock grazing from other new mineral or road developed could be reduced as compared with Alternative A.

Season-specific limitations on disturbance could impact the time during which range improvements, such as stock ponds to improve livestock distribution, could be constructed, with some potential impacts on management time and cost for permittees.

Vegetation Management and Fire (including invasive plants and juniper encroachment)

Under Alternative D, priority for restoration and vegetation treatment would be on treating PHMA to maintain and expand healthy GRSG habitat. There would be objectives for short- and long-term habitat conditions, and they would include specific objectives for the establishment of sagebrush cover and height, as well as cover and heights for understory perennial grasses and forbs necessary for GRSG seasonal habitats. Impacts could occur should treatments in this habitat not match with vegetation objectives for livestock grazing; however, in most cases, treatments (e.g., conifer removal) would improve forage conditions in the long term.

Restoration projects would be developed with involvement from local agencies; therefore, impacts on livestock grazing would be reduced due to incorporation of local habitat needs.

Under Alternative D, wildland fire management would be prioritized in PHMA, with an emphasis on maintaining, protecting, and expanding sagebrush ecosystems. Management actions would be similar to those described in Alternative B, with additional measures providing direction for site-specific variables and specific GRSG habitat types (e.g., winter habitat) and use of strategic suppression planning in PHMA. As a result, impacts would be similar to those in Alternative B, with increased potential for limitations on grazing management and decreased change disturbance from wildfire in the long term, as compared with Alternative A.

As in Alternative B, fine fuels management projects using livestock grazing have the potential to result in site-specific opportunities for short-term site-specific increases in grazing in PHMA requiring intensive management, but impacts are likely to be minimal overall.

Livestock Grazing and Wild Horses and Burros

Under Alternative D, acres available for livestock grazing and permitted AUMs would be the same as under Alternative A.

Grazing management actions and impacts would be similar to those described in Alternative B, with a moderate decline in permitted grazing anticipated over time as permits are modified to incorporate GRSG objectives at renewal or allotment analysis. As described in Alternative B, GRSG habitat objectives and management considerations would be incorporated into grazing allotments through allotment management plans or permit renewals, or Forest Service NEPA

processes. However, under Alternative D, local objectives would be developed with the state and local governments. As a result, impacts on grazing systems could occur upon permit renewal or allotment NEPA analysis, as discussed in Alternative B, but collaboration with the state should decrease conflicts in livestock grazing practices and provide a location-appropriate framework, assisting permittees' ability to adopt these measures and thereby reducing impacts.

As described in Alternative B, riparian and wetland habitat would be managed to move towards or maintain proper function condition or Forest Plan standards and guidelines, and strive towards GRSG habitat objectives; impacts on grazing would be as described in Alternatives A and B.

Water developments and structural range improvements under Alternative D would be permitted with limitations; impacts on grazing would be as described in Alternative B.

Overall, impacts would be as described for Alternative B but would vary on a site-specific basis.

Travel and Transportation

Under Alternative D the nature and type of impacts would be as described under Alternatives A and B. Under Alternative D, 77,000 acres are available for cross-county travel (a 90-percent reduction in the decision area compared with Alternative A), and areas limited to existing routes would be increased (1,249,500 acres, nearly 3 times more acres than Alternative A). Additionally, PHMA would be limited to existing routes at a minimum, and road restoration would be prioritized. As a result, livestock disturbance is likely to be reduced, particularly in PHMA and in certain population areas prioritized for travel management planning. Access to livestock and structural range improvements is not likely to be impacted by the creation of activity-based plans under Alternative D.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative D, the nature and type of impacts from ROW development would be as described under Alternatives A and B. Under Alternative D, however, restrictions on ROW development in GRSG occupied habitat would differ based on the type of ROW authorization (**Table 2.3**). Exclusion areas for aboveground linear ROWs would be 1,422,300 acres, 50 times more than exclusion areas in Alternative A. Therefore, the chance of disturbance from linear projects (e.g., transmission lines) would be decreased as compared with Alternative A. Exclusion areas for underground ROWs would cover a more limited area, but development of these areas would be less likely to disturb livestock. Finally, exclusion areas for site-type ROWs would be 219,900 acres in mapped GRSG habitat (approximately 8 times more than Alternative A), with additional limitations on disturbance. Outside of occupied habitat, population areas would have restrictions placed on ROW development, similar in magnitude to Alternative A. Overall, impacts from all types of ROW development would be decreased in GRSG habitat under Alternative D as compared with Alternative A, which would benefit forage sustainability and livestock grazing in general.

Mineral Development (including geothermal)

Under Alternative D, restrictions would be applied to mineral and energy development as in Alternative B (**Table 2.3**). Additional restrictions and stipulations on energy and mineral development would be applied for seasonal habitat requirements, as well as areas adjacent to

leks in PHMA and GHMA. As a result, disturbance to livestock grazing could be reduced in these areas as compared with Alternative A.

Other Actions

Impacts from recreation would be the same as those described under Alternative B.

4.16.6 Alternative E

Under Alternative E1, mapped GRSG habitat in SGMAs would be managed for the conservation of the species and no specific management actions are proposed for mapped GRSG habitat outside SGMAs. This alternative would allow for greater flexibility in management options, thereby limiting impacts on range management. Site-specific variation is more likely to occur due to variation in management actions based on season of use and type of GRSG habitat.

Under Alternative E2, as in Alternative B, management objectives would focus on core habitat as identified by the state of Wyoming. As described for Alternative E1, this alternative would allow for greater flexibility in management options limiting impacts on range management. Site-specific variation is more likely to occur due to variation in management actions based on season of use and type of GRSG habitat.

Greater Sage-Grouse Management

Alternative E1

Under Alternative E1, mapped GRSG habitat in SGMAs would be designated. Objectives for enhancement of mapped GRSG habitat in SGMAs and to increase the total acres of GRSG habitat adjacent to SGMAs would be developed; with potential for impacts on livestock management should GRSG objectives not match livestock needs.

Similar to Alterative D, Alternative E1 would include a limit on permanent disturbance of 5 percent of habitat. However, under Alternative E1, this would only apply to new disturbances within any particular SGMA. As a result, there are not likely to be substantial changes to the level of disturbance to livestock from other activities (including mineral development, etc.) as compared with Alternative A. Ability to construct range improvements is also not likely to be impacted by the proposed cap.

Specific limitations on disturbance would be based on habitat type (e.g., winter and breeding) and season, with potential for related limitations on range improvements. However, some flexibility in implementation would be permitted and would limit impacts.

Alternative E2

Under Alternative E2, core areas and noncore areas would be designated in the project area. Vegetation composition and structure would be managed consistent with ecological site potential to achieve seasonal GRSG seasonal habitat objectives within core areas. The document "Grazing Influence, Management, and Objective Development in Wyoming's Greater Sage-Grouse habitat (Cagney et al. 2010) would be used as guidance when determining appropriate management actions to be considered.

Opportunities for habitat enhancement and conservation within core areas would be prioritized based on threats and the ability to manage GRSG habitat, and site-specific conservation and mitigation objectives would be included in project planning within GRSG habitats. Given these management strategies, forage is likely to be improved in many circumstances in the long term.

Range improvements would be authorized only if they maintain and/or improve GRSG and its habitat within core areas. This could limit where water developments and fences are located, which could affect livestock management in some areas.

Vegetation Management and Fire (including invasive plants and juniper encroachment)

Vegetation Management

Alternative E1. Under Alternative E1, protection of GRSG habitat would be prioritized, and active vegetation projects (e.g., conifer removal) would be permitted to improve GRSG habitat. Protection of GRSG habitat and vegetation management projects could restrict management options for livestock grazing, but are also likely to improve forage conditions in the long term. Treatment projects within nesting and winter habitat would be limited; therefore, impacts in these habitats would be limited.

Alternative E2. Under Alternative E2, protection of GRSG habitat would be prioritized, and projects that have the greatest chance to improve habitat for GRSG would be implemented over other projects. As described for Alternative E1, implementation of vegetation restoration projects that improve GRSG habitat could restrict management options for livestock grazing but are also likely to improve forage conditions in the long term.

Wildland Fire Management

Alternative E1. Under Alternative E1, fire suppression and fuels treatments would be designed to minimize the replacement of burned native vegetation by invasive plants. Use of prescribed fire would be limited, and treatment efforts would be designed with state government. Retention of native plants could benefit forage conditions. Creation of a state fire plan would improve ability to respond to wildfire across all lands in the planning area and would reduce the risk of livestock grazing disturbance from fire.

The use of prescriptive grazing would be considered specifically to reduce fire size and intensity on all types of land ownership, where appropriate. As discussed in Alternative B, this could involve high-intensity, short-duration grazing, which would require more intensive management than standard season-long grazing practices to keep the livestock focused on the areas where the effect is needed. To support such management, there is a potential for increased herding and temporary fencing in order to concentrate livestock in the desired area. As a result, management costs and time could be greater compared with standard season-long grazing practices.

Alternative E2. Under Alternative E2, vegetation and fuels treatments would be designed with an emphasis on protecting existing sagebrush ecosystems and enhancing and protecting future sagebrush ecosystems. Recommended protocols such as WGFD Protocols for Treating Sagebrush to Benefit Sage-Grouse (WGFD 2011) and BLM IM 2011-138 (Sage-Grouse

Conservation Related to Wildland Fire and Fuels Management) would be used in determining whether a proposed treatment constitutes a "disturbance" that would contribute toward the 5 percent disturbance cap for habitat maintenance. Additionally, these protocols would be used to determine whether the proposed treatment configuration would be expected to have neutral or beneficial impact for priority populations or if they represent additional habitat loss or fragmentation.

In core areas, suppression would be prioritized immediately after firefighter and public safety to conserve GRSG habitat. Grazing on treated areas would be deferred for two full growing seasons unless vegetation objectives or vegetation recovery indicates a shorter or longer rest period is necessary based on vegetation monitoring results.

The focus on protecting existing sagebrush ecosystems and enhancing future sagebrush ecosystems, and limitations placed on grazing after fire could reduce the current amount of forage available for livestock in the short and long term, especially if sagebrush density is not reduced in some areas on the landscape.

Livestock Grazing and Wild Horses and Burros

Alternative E1

Under Alternative E1, acres available for livestock grazing and permitted AUMs would be the same as Alternative A. Existing grazing operations would use recognized rangeland BMPs to improve habitat for GRSG, thereby increasing the potential for nesting success and population recruitment with limited impacts on grazing management. GRSG seasonal requirements would be considered at the site-specific level during grazing management operations based on specific guidelines for different types of GRSG habitat (e.g., breeding and winter habitat). While other alternatives allow for potential changes to grazing strategies to meet GRSG habitat objectives, under Alternative E1, more specific implementation direction is provided that has the potential to impose limits on grazing in specific habitats or vegetation conditions with potential impacts on grazing systems and resulting in increased time and costs for permittees. For example, management of the time, timing, and intensity of grazing to provide for the seasonal needs of GRSG could require increased time and costs for permittees compared with Alternative A.

In general, under Alternative E1, impacts would be similar to those described in Alternative D; however, under Alternative E1, the management direction is more prescriptive.

In riparian and wetland habitat, as well as water developments, management would emphasize the protection and enhancement of mesic habitat. Rangeland improvements, including water developments in and around riparian and wetland areas, would be managed for the protection and enhancement of the mesic habitat. As a result, there would be potential limitations on placement or type of range improvement or water development and a related cost increase for permittees.

Alternative E2

Under Alternative E2, acres available for livestock grazing and permitted AUMs would be the same as Alternative A (see **Table 2.3**). In GRSG habitat, livestock numbers (AUMs) and season of use could be adjusted during site-specific evaluations conducted during term grazing permit

renewals, allotment management plan development, or other appropriate implementation activity. Additionally, temporary adjustments could be made annually to livestock numbers, season of use, and other aspects of grazing management within the terms and conditions of the permit.

Under Alternative E2, landscape management strategies on both public and private lands would be coordinated to improve GRSG habitat. Similar to current conditions, if periods of drought occur, the season of use and stocking rate would be evaluated and adjusted through coordination with grazing permittees, which would maintain forage production for livestock in the long term.

Under Alternative E2, management in riparian and wetland habitat management would be the same as described for Alternative E1. As a result, there would be potential limitations on placement or type of range improvement or water development and related increase in costs for permittees.

Under Alternative E2, priority would be placed on retaining sagebrush ecosystems, which would likely reduce the number and extent of seeding projects. This would likely reduce forage for livestock in the long term.

Travel and Transportation

Alternative E1

Under Alternative E1, the nature and type of impacts would be as described under Alternatives A and B. Under Alternative E1, 351,700 acres of the decision area would be available for cross-county travel (a 55 percent reduction from Alternative A), and areas limited to existing routes would be increased (888,000 acres, a 100-percent increase in the decision area from Alternative A). Additionally, mapped GRSG habitat in SGMAs with nesting and winter habitat would be managed at least as limited to existing routes until travel management planning is complete. As a result, disturbance to livestock would likely be reduced, particularly in mapped GRSG habitat in SGMAs. However, ability to access livestock or structural range improvements could be reduced as compared with Alternative A. Adoption of travel management plans would be at the county level; therefore, impacts are difficult to predict, but plans would likely provide access for permittees.

Alternative E2

Under Alternative E2, all acres of the planning area in Wyoming are on National Forest System lands. OHV use on National Forest System lands within the planning area is limited to roads, trails, and areas that have been designated through a transportation planning process; therefore, effects on livestock grazing would be similar to those described under Alternative A.

Infrastructure Development (including all ROWs and utility corridors)

Alternative E1

Under Alternative E1, the nature and type of impacts from ROW development would be as described in Alternatives A and B. ROW exclusion areas would be the same as Alternative A, and ROW avoidance areas would be increased to 2,654,000 acres in mapped occupied GRSG

habitat (approximately 40 times more than Alternative A). Similarly, in population areas outside of occupied habitat, exclusion areas would be the same as Alternative A, and avoidance areas would be doubled (103,200 acres). These management actions would result in decreased potential for disturbance of livestock from development. Management stipulations mitigating direct construction disturbance for GRSG would also decrease livestock disturbance.

Alternative E2

Under Alternative E2, the nature and type of impacts from ROW development would be as described for Alternative E1. Management actions would result in fewer disturbances from development, and management mitigating construction disturbance for GRSG would decrease disturbance of livestock.

Under Alternative E2, wind energy development would not be allowed inside core areas unless it could be sufficiently demonstrated that the development activity would not result in declines of core area populations. Areas that are currently unavailable due to the need to protect sensitive resources would remain unavailable for wind energy development. These management actions would also reduce disturbance for livestock.

Mineral Development (including geothermal)

Under Alternatives E1 and E2, mineral and energy development would be limited compared with Alternative A (**Table 2.3**). Additional limitations would be placed on permanent disturbances, as well as on season-specific limitations on development activities, further limiting disturbance to livestock grazing as compared with Alternative A.

Other Actions

Under Alternatives E1 and E2, impacts from recreation would be similar to those descried in Alternative B but would vary depending on season of use and type of GRSG habitat (e.g., winter and breeding) based on management actions targeting these specific habitat requirements.

4.16.7 Proposed Plans

Mapped occupied GRSG habitat would be designated as PHMA and GHMA under this alternative, and impacts would primarily occur to range management in PHMA due to restrictions on resource uses within this area. Many management actions and related impacts would be similar to those described in Alternative B and D.

Greater Sage-Grouse Management

Similar to Alternative B, under the Proposed Plans, livestock grazing would be managed to achieve or maintain desired conditions in GRSG seasonal habitats. For BLM administered lands, general guidelines would be applied from Objective GRSG–3. In addition to restrictions on management in PHMA and GHMA, 228,500 acres designated as SFA, which provide additional restrictions on disturbance for this area.

On National Forest System lands, livestock grazing would be managed to achieve or maintain desired conditions in GRSG seasonal habitats as described in **Sections 2.6.3** and **2.6.4**. Livestock grazing would be managed to maintain residual herbaceous grass height for overhead and lateral concealment for GRSG nesting and early brood rearing life stages by implementing grazing use guidelines as described in **Sections 2.6.3** and **2.6.4**. Wet meadows and riparian

areas would be managed to sustain a rich diversity of perennial forb species relative to site potential, and winter habitat would provide sufficient sagebrush height and density for food and cover for GRSG during this seasonal period.

In the Proposed Plans, management actions include certain vegetation objectives in PHMA based on VDDT modeling. Approximately 180,900 acres have been identified for conifer removal treatments and 48,000 acres for annual grass treatment to meet GRSG objectives on BLM and National Forest System lands. Where vegetation objectives do not meet forage objectives for livestock grazing, this would result in the need to modify grazing practices with potential for increased time and costs for permittees in these areas.

Management actions designed to enhance GRSG habitat on BLM and National Forest System lands could affect livestock grazing modification of grazing strategies or rotation schedules, changes to duration and/or the season of use, changes to the kind and class of livestock, or reduction of livestock numbers. These modifications could result in the reduction of AUMs on some allotments. Management to achieve these desired conditions would also impact permittees by increasing the amount of time permittees spend to manage livestock on National Forest System lands as well as the total costs to a livestock operation.

Indirectly, implementation of management direction to achieve desired conditions in GRSG seasonal habitat could be beneficial to livestock grazing in the long term, particularly on allotments where rangeland conditions could be improved, by implementing management that improves rangeland conditions. Improved rangeland condition could also contribute to increased forage production.

Similar to Alternatives B and D, the Proposed Plans would include a cap on anthropogenic disturbance; the 3 percent disturbance cap (5 percent on National Forest System lands in Wyoming) on discrete anthropogenic disturbances would be applied in PHMA at both the BSU and project levels, and a limit would be placed on the density of energy/mining facilities. Anthropogenic disturbances in PHMA and GHMA would also be mitigated to ensure a net conservation gain to GRSG. In addition, conservation measures would be implemented in PHMA and GHMA such as adaptive management and defined monitoring protocols (**Appendices B** and **C**), RDFs (**Appendix G**), and lek buffers (**Appendix F**). As a result, indirect disturbance of livestock grazing or livestock forage from other new mineral or road development could be reduced as compared with Alternative A.

As under Alternative D, season-specific limitations on disturbance could impact the timing of range improvement construction, with some potential impacts on management time and cost for permittees. Tall structure restrictions may also impose some location specific limits on range improvement structures.

Vegetation Management and Fire (including invasive plants and juniper encroachment)
Impacts from vegetation management under the Proposed Plans would be similar to those described for Alternative D. The Proposed Plans would include additional measures such as conifer removal, improved management of wet meadows, and implementation of RDFs.

Impacts could occur should treatments for GRSG do not match with vegetation objectives for livestock grazing; however, in most cases, treatments (e.g., conifer removal) would improve forage conditions in the long term.

Impacts from wildland fire management would also be similar to those described for Alternative D with an emphasis on maintaining, protecting, and expanding sagebrush ecosystems. The Proposed Plans would also include assessment of management needs based on local conditions as detailed in **Appendix K**. These actions may result in site-specific limitations on grazing management in GRSG habitat but would help to reduce the likelihood of catastrophic wildfire and subsequent disturbance of livestock and reduction of forage as compared to Alternative A. Fires outside of GRSG habitat would possibly be at risk of decreased suppression efforts, therefore the amount of forage in these areas could be impacted should fires occur.

As in Alternative B and D, fine fuels management projects using livestock grazing have the potential to result in site-specific opportunities for short-term site-specific increases in grazing in PHMA requiring intensive management at the expense of livestock performance, but impacts are likely to be minimal overall.

Under the Proposed Plans on National Forest System lands, measures to protect GRSG habitat from fire and associated fire operations would be beneficial to livestock grazing, especially in the 12-inch or less precipitation zone, because it would help prevent expansion of nonnative invasive species such as cheatgrass. Management direction to protect GRSG habitat from fire in higher elevation sagebrush habitats (i.e., mountain big sagebrush) could indirectly negatively impact livestock grazing in the long term as sagebrush potentially increases and forage production decreases.

Livestock Grazing and Wild Horses and Burros

Under the Proposed Plans, acres available for livestock grazing and permitted AUMs would be the same as under Alternative A on BLM-administered and National Forest System lands.

As described in Alternative D, GRSG habitat objectives would be incorporated into grazing allotments through allotment management plans or permit renewals, or Forest Service NEPA processes, with consideration for local objectives. Current direction for livestock grazing under Alternative A is generally less restrictive than direction described under the Proposed Plans, therefore, grazing use guidelines would directly impact livestock grazing management on National Forest System lands. Impacts could include modification of grazing strategies or rotation schedules, changes to the season of use, changes to kind and class of livestock, closure of a portion of an allotment, or reduction of livestock numbers. Implementation of this management direction could result in the reduction of AUMs on some allotments, and possibly overall operation viability.

Impacts would be similar to those described in Alternatives B and D, with a moderate decline in permitted grazing anticipated over time as permits are modified to meet objectives. Under the Proposed Plans, priority for land health assessment and permit renewal on BLM-administered lands would include SFA first followed by PHMA outside the SFA. Precedence will be given to existing permits/leases in these areas not meeting Land Health Standards, with a specific focus

on those containing riparian areas, including wet meadows. Timeline for changes in management would follow this priority.

On BLM-administered lands, adjustments to grazing management or authorized grazing use level would be tailored to achieve Land Health Standards and specific management thresholds based on the GRSG Habitat Objectives Table for the GRSG habitat type in the areas assessed (i.e., breeding, nesting, wintering, etc.). Site-specific review of seasonal habitat type would be required as part of the land assessment process on BLM-administered lands; quantitative analysis of current GRSG seasonal habitat conditions of allotments is not available and is likely to change over time based on precipitation level and other factors. Modifications to grazing systems could be required to meet seasonal habitat objectives, increasing costs to lessees and permittees. Acres within nesting habitat may be more likely to require changes to grazing management, due to the various desired conditions for this habitat type. Impacts would occur on an allotment scale as permit renewal and related management changes were implemented. The level and intensity of impacts would vary on a site-specific basis.

Under the Proposed Plan on National Forest System lands, livestock grazing would be managed to achieve or maintain desired conditions in GRSG seasonal habitats as described in **Sections 2.6.3** and **2.6.4**. Livestock grazing would also be managed in order to maintain residual perennial grass height to provide for adequate GRSG nesting cover according to the guidelines described in **Sections 2.6.3** and **2.6.4**. Implementation of grazing use guidelines under the Proposed Plan on National Forest System lands would impact about 117 allotments, 726,553 acres, and 214,955 AUMs in nesting and brood-rearing habitats within active grazing allotments. Implementation of Forest Service grazing guidelines could also directly impact permittees by increasing the amount of time permittees spend to manage livestock on National Forest System lands as well as the total costs to a livestock operation. Impacts would occur at the allotment scale as management direction is incorporated into permits, allotment management plans, and annual operating instructions. The level and intensity of impacts could vary on a site-specific basis with permitted grazing likely decreasing moderately over time as permits are modified to achieve desired conditions and meet annual grazing use guidelines.

Managing livestock grazing to achieve the desired conditions in on BLM and Forest Service System lands and livestock use guidelines on National Forest System Lands may indirectly benefit rangeland conditions by increasing vegetation productivity and increasing forage in the long term. This in turn would provide managers and permittees better management options, especially on those allotments where livestock numbers are approaching a sustainability threshold or during drought and other disturbances such as wildfire.

Monitoring of site conditions would be mandated as detailed in **Appendix C**. Areas not achieving the GRSG habitat objectives due to grazing, would be required to apply adjustments to livestock grazing to achieve these objectives. This strategy could result in site-specific changes in permitted use levels or grazing management strategy.

Water developments and structural range improvements would be permitted with limitations similar to Alternatives B and D. Under the Proposed Plans, new and existing structural range improvements would be required to have a neutral effect or conserve, enhance, or restore GRSG. Additional constraints on National Forest System lands would be applied as compared to

Alternative A, these include prohibiting fence construction or reconstruction within 1.2 miles from the perimeter of occupied leks unless the collision risk can be mitigated through design features or markings, not constructing new permanent livestock facilities (e.g., windmills, water tanks, corrals) within 1.2 miles from the perimeter of occupied leks, and not constructing water developments in PHMA unless they are beneficial to GRSG.

Prohibitions on new structural improvements on BLM and National Forest System Lands could limit the ability of permittees to effectively distribute livestock resulting in increases in time and costs to permittees and potentially the ability to full use of permitted AUMs. Although these constraints could increase the amount of time permittees spend to manage livestock, it should allow sufficient flexibility that permittees could continue to use structural range improvements to effectively distribute livestock.

Under the Proposed Plans on National Forest System lands, sheep camps would not be located within 1.2 miles from the perimeter of a lek during lekking season and trailing of livestock during breeding and nesting seasons would be minimized during breeding and nesting seasons. This management direction would result in the need to modify grazing practices with increased costs for permittees in these areas.

Under the Proposed Plans, as under Alternatives B, C, and D voluntary relinquishment of grazing privileges would be permitted. Under the Proposed Plan, the BLM may determine if relinquished allotments should remain available for livestock grazing or be used for other resource management objectives per WO IM 2013-184. This may result in some reduction of overall available AUMs. Economic impacts on local communities that depend on livestock grazing are further discussed in **Section 4.23**. Under the Proposed Plans, the Forest Service would consider closure of grazing allotments, pastures, or portions of pastures, or managing the allotment as a forage reserve as opportunities arise where removal of livestock would enhance the ability to achieve desired habitat conditions. These actions would occur according to applicable regulations and, when implemented, would result in the reduction of overall available AUMs.

Managing wild horse and burro populations within AMLs, or adjusting AML, to restore, enhance, or maintain GRSG desired habitat conditions would be beneficial to livestock grazing in the long term by increasing vegetation productivity and increasing forage production, particularly where rangeland conditions could be improved.

Prioritizing gathers in HMAs and herd areas in PHMA to meet established AMLs would reduce any current levels of forage competition between wild horses and burros and livestock on allotments in PHMA and aid in meeting GRSG habitat objectives.

Travel and Transportation

Under the Proposed Plans the nature and type of impacts would be as described under Alternatives A, B, and D. Under the BLM Proposed Plan, 525 acres are available for cross-county travel (a 99-percent reduction in the decision area compared with Alternative A). Additionally, PHMA and GHMA would be limited to existing routes on BLM-administered lands until travel management planning occurred (1,274,700 acres, 2.9 times more acres than Alternative A). On National Forest System lands, new road or trail and construction would be

prohibited in GRSG habitat, and road construction within riparian and mesic meadows would be restricted. As a result, disturbance of livestock and forage is likely to be reduced in GRSG habitat compared to Alternative A. This could indirectly improve forage production and improve overall rangeland conditions.

Under the Proposed Plan, temporary closures on BLM-administered lands would also be permitted as determined necessary for resource protection. Closures would further reduce disturbance to livestock but have the potential to impact ability of permittees/leases to access allotments and livestock.

Infrastructure Development (including all ROWs and utility corridors)

Under the Proposed Plans, the nature and type of impacts from ROW development would be as described under Alternatives A, B, and D. In the Proposed Plans, areas with designated aboveground corridors would remain open (25,100 acres). ROW development would be limited within the 2,764,800 acres of avoidance areas and 28,100 acres of exclusion areas, which would benefit forage sustainability and livestock grazing. Within GHMA, the majority (594,400 acres) would remain open to ROW development. As a result, ROW development and associated disturbance to livestock and livestock forage are likely to be concentrated in designated corridors and GHMA.

Under the Proposed Plan on National Forest System lands, SUAs, land ownership adjustments, and land withdrawals would be restricted or mitigated to avoid or reduce adverse impacts on GRSG in PHMA and GHMA. This management direction would limit the direct and indirect impacts of development and surface disturbance on rangelands where livestock grazing is permitted.

PHMA would be designated as exclusion areas for wind energy development on BLM-administered lands and limits would be placed on authorizations in GHMA. Management direction on Forest Service System lands would prohibit solar and wind development in PHMA and impose restrictions on development in GHMA. As a result, impacts associated with ground disturbances from development of future development these resources would be limited. This management direction could limit the direct impacts of development and surface disturbances on existing rangelands. However, this may shift development to areas outside of PHMA and GHMA.

As discussed under *Greater Sage-Grouse Management*, above, limits on anthropogenic disturbance, mitigation strategy, lek buffers and other conservation measures in the Proposed Plans would further limit disturbance as compared to Alternative A, resulting in reduced indirect impacts on livestock and livestock forage in PHMA.

Mineral Development (including geothermal)

Under the Proposed Plans restrictions would be applied to mineral and energy development as in Alternatives B and D. Restrictions under the Proposed Plans include the closure of PHMA and some portions of GHMA to nonenergy mineral leasing (3,370,000 acres closed, 24 times more than under Alternative A), and closure to mineral materials development on 3,340,200 acres (45 times more than under Alternative A). SFA would be recommended for withdrawal from the Mining Law of 1872, as amended. Further, coal management would emphasize underground

mining, surface disturbances would be limited in all PHMA and prohibited on Forest Service and other mitigation measures would be applied to reduce disturbances for leased coal mines and associated facilities, which would reduce disturbance to livestock grazing.

Acres closed to fluid mineral leasing in GRSG habitat would be the same as Alternative A, but NSO stipulations would be applied on 3,258,300 acres (7 times more than under Alternative A), thereby reducing acreage of surface-disturbing impacts from fluid mineral development in these areas.. CSU and timing restrictions would be applied in GHMA. New leases would be prioritized in non-habitat first and then in the least suitable habitat for GRSG. For existing leases under the Proposed Plans, leaseholders would be required to avoid and minimize surface-disturbing and disruptive activities in PHMA for leases that are not yet developed. In addition, on National Forest System lands, reclamation plans would be designed to restore habitat to desired conditions. Fluid mineral operations would be mitigated in PHMA to reduce soil compaction to improve vegetation reestablishment and keep GRSG habitat disturbance to a minimum.

Minerals management direction under the Proposed Plans would limit development and surface disturbance, therefore reducing related disturbance of rangeland and forage resources would be reduced. As discussed under *Greater Sage-Grouse Management*, above, limits on anthropogenic disturbance, mitigation strategy, lek buffers and other conservation measures in the Proposed Plans would further limit disturbance as compared to Alternative A, resulting in reduced indirect impacts on livestock and livestock forage in GRSG habitat.

Other Actions

Under the Proposed Plans, limitations would be applied on recreational use in GRSG habitat in PHMA. Limitations include the prohibition of construction of new recreation facilities or expansion of existing recreational facilities (e.g., roads, trails, campgrounds) unless the development results in a net conservation gain to GRSG and/or their habitats. In addition, issuance of SRPs on BLM administered lands and SUPs on National Forest System lands would be restricted in PHMA; terms and conditions that protect or restore GRSG habitat would be included in new permits/authorizations and existing permits and operating plans would be modified to protect and/or restore GRSG habitat. Temporary recreation uses that result in the loss of GRSG habitat would not be authorized on National Forest System lands.

Impacts from restrictions on recreation on livestock would be similar to those discussed under Alternative A and D, and include benefits such as reduced disturbance of livestock and livestock forage and reduction of unwanted dispersal.

4.17 RECREATION

4.17.1 Methods and Assumptions

Impacts on recreation can be direct or indirect. Management actions that alter or prohibit users' opportunities to access recreation areas or participate in recreation activities would result in a direct impact. Indirect impacts are those that change the physical, social, or administrative setting within which recreation activities take place. In areas where management prescriptions are in place to achieve or maintain desired settings and/or activities, a change to the setting or availability of recreation opportunities would result in an impact.

Indicators

Indicators of impacts on recreation are as follows:

- Change in the types of recreation activities and opportunities in the decision area, especially those within areas where recreation is the management focus
- Change in the number and type of recreation permits issued on an annual basis within the decision area

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Recreational OHV use will continue to be a recreation activity, especially in the Sheeprocks, Bald Hills, Uintah, and Panguitch Population Areas.
- Recreation activity, particularly recreational OHV use and mountain biking, is expected to increase throughout the life of current LUPs.
- Outside areas where recreation is the management focus, the BLM and Forest Service will manage for recreation activities that consist mostly of dispersed activities where users participate in activities individually or in small groups.
- The potential for resource impacts and conflicts between all types of users, but particularly between motorized and nonmotorized users, will increase with increasing use.
- BLM and Forest Service management of areas as unsuitable for public utilities (i.e., ROW exclusion areas) preserves recreation opportunities.
- Closure of areas to mineral development decreases the likelihood for conflict with recreation users and maintains desired recreation settings in those areas.
- Outdoor recreation will continue to be an important component of the local economy.
- Demand for recreation permits will remain steady or gradually increase.
- The BLM and Forest Service will continue to issue recreation permits on a discretionary basis.

4.17.2 Alternatives Analysis

Compared with a continuation of existing management under Alternative A, proposed actions for other resource programs under Alternatives B through E would result in fewer conflicts with recreational activities. Management under Alternatives B through E includes reductions in AUMs for livestock grazing, designation of ROW exclusion and avoidance areas, and closure to mineral leasing and development. **Table 2.3** provides a quantitative overview of how management actions with the potential to affect recreation would vary across alternatives. Acreages shown apply to all areas within identified population areas. Some acres shown may be for areas outside GRSG habitat but within the population area boundaries.

While BLM and Forest Service management for the protection of GRSG habitat would generally result in a reduction in surface-disturbing activities that conflict with recreation opportunities,

BLM and Forest Service management under Alternatives B through E for recreation would also limit recreation opportunities. Impacts on recreation under each alternative from BLM and Forest Service recreation management is described below.

Under Alternative A, the BLM and Forest Service would continue to manage recreation uses as identified in the existing LUPs. The BLM and Forest Service would continue to review and approve recreation permits on a case-by-case basis. Current recreational opportunities in the decision area would continue, and there would be no new impacts on recreation under Alternative A.

Under Alternative B, the BLM and Forest Service would only issue recreation permits for activities in PHMA that have a neutral or beneficial effect on PHMA. As a result, some types of permitted activities (e.g., OHV races) that could negatively affect GRSG habitat could be impacted under Alternative B. This would result in a reduction in the number and type of recreation permits issued in the decision area and would result in fewer opportunities to engage in the types of events and activities affected. The potential for impacts would be greatest where OHV use is most popular, such as in the Sheeprocks population area.

BLM and Forest Service management under Alternative C would contain the most restrictions on recreational activities. For example, under Alternative C, BLM and Forest Service management would seasonally prohibit camping and other nonmotorized recreation within 4 miles of active leks. This would result in temporary reductions in recreational opportunities and would decrease the area available for recreational opportunities such as camping, mountain biking, and hiking. Impacts would be greatest in proximity to those developed recreation sites identified on **Map 3.17-2**, particularly in population areas coinciding with the National Forests along the Wasatch Front and BLM sites in the Uintah, Parker Mountain, Sheeprocks, and Rich County Population Areas. Opportunities for other popular nonmotorized recreation activities such as mountain biking, rock climbing, and equestrian use would also be reduced in these areas.

Alternative C contains the greatest restrictions on coal leasing, ROWs, fluid mineral leasing, and livestock grazing. These restrictions would reduce the potential for conflict with recreational access and degradation of physical setting characteristics within SRMAs. However, a portion of mapped occupied habitat would also be closed to OHV travel under this alternative, reducing the availability of motorized recreational opportunities in the closure areas. It should be noted, however, that the majority of the closed areas are absent mapped routes.

Impacts on recreation and visitor services under Alternative D would be the same as Alternative B, with the exception that the BLM and Forest Service would also evaluate existing recreation permits and modify or cancel those that are determined to have adverse effects on GRSG habitat. In addition to restrictions on future recreational activities and events that are required to be permitted, Alternative D would result in a loss of opportunities to continue engaging in current activities and events if they are found to have adverse effects on GRSG habitat.

Alternative D proposes several restrictions on surface-disturbing activities (see **Table 2.3**). These restrictions would affect recreation as described under Alternative C, although across a smaller portion of the decision area.

BLM and Forest Service management under Alternative E would include permanent, seasonal, and time-of-day limitations on activities within 1 mile of occupied leks if the activity disrupts GRSG nesting and brood rearing. Similar to Alternative C, this would result in temporary (or permanent) loss of recreational opportunities, particularly for activities that generate noise or result in surface disturbance. Locations of the greatest impacts would be similar to Alternative C.

Impacts under the Proposed Plans would be similar to those under Alternative D, except that there would be additional restrictions on recreation facilities in PHMA, possibly leading to a partial inability to fulfill long-term recreation opportunities in those areas. The 3 percent anthropogenic disturbance cap would similarly restrict recreation facility placement in PHMA over the long term in areas that exceed the cap. The Utah sub-regional adaptive management strategy could limit recreational opportunities and activities over the short or long term if recreation is found to be a causal factor in not meeting GRSG conservation objectives. Adaptive management responses that restrict other uses (e.g., ROW development), could improve recreational opportunities due to reduced conflicts.

4.18 Comprehensive Travel and Transportation Management

4.18.1 Methods and Assumptions

Indicators

Indicators of impacts on travel management are as follows:

- Change in the types of transportation activities occurring on routes that could impact GRSG or habitat
- Change in the acreages designated as open, limited, or closed to OHV travel
- Change in the number of acres where new road development would be allowed

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- The demand for access to travel routes on BLM-administered and National Forest System lands would continue to increase over the life of the LUPs.
- Administration of updated agency travel management policy, rules, and planning and design guidelines will change public land travel systems through design, making them more sustainable while decreasing potential impacts on resources.
- OHV use will continue to increase.
- The designation of individual routes as open, closed, or limited for motorized use is an implementation-level process and not considered as part of a LUP (planning-level) process.
- The potential for resource and user conflict increases as OHV use increases and becomes more concentrated.

- Travel systems are dynamic and will be changed through subsequent implementation-level planning efforts.
- Implementation of a travel management plan would include increased public education, signing, enforcement, and resource monitoring in regard to travel management.
- Effects of implementing travel management under the Proposed Plans on National Forest System lands are similar to those described in Alternative A.

4.18.2 Alternatives Analysis

Impacts on travel and transportation management are those that restrict or enhance transportation and access (e.g., managing areas as closed to OHV travel or limiting such use to existing routes and applying seasonal travel limitations). New travel and transportation management actions in response to GRSG habitat-protection strategies could limit the types of travel-related activities allowed in GRSG habitat. For example, closing areas to OHV travel or restricting OHV travel to existing routes in areas that were previously open to cross-country OHV travel would reduce access. Additionally, management actions that restrict future route construction limit the ability of the travel network to accommodate increased travel demands over time. Conflicts among route users could increase if the existing network becomes congested.

All alternatives would defer travel management route designations to a separate process following the current LUPA process. As such, for each alternative, the BLM and Forest Service would manage varying acreages as open, limited, or closed to cross-country OHV travel. **Table 2.3** shows the total areas open, limited, and closed to cross-county OHV travel by alternative.

Under Alternative A, the BLM and Forest Service would maintain current levels of travel management as identified in the existing LUPs. For example, areas currently designated as open to cross-country OHV use would continue to be managed as such. There would be no new restrictions related to GRSG habitat management and no change in impacts on travel management under Alternative A.

Under Alternative B, the BLM would limit OHV travel to existing roads and trails in PHMA until travel management is completed, at which time OHV travel would be change to limited to designated routes. OHV travel on National Forest System lands would continue to be limited to existing routes. The area designation change on BLM-administered lands from open to limited would reduce cross-country access in those portions of PHMA that were previously managed as open. Applications for the upgrading or realignment of existing routes would be required to meet certain design, location, and mitigation criteria intended to protect GRSG habitat. These requirements may preclude the construction of some new routes, but would be unlikely to reduce access across the decision area. Alternative B would also require increased signage and education alerting OHV users of limitations on cross-country travel and added processing requirements for transportation-related projects in GRSG habitat. Signage and education would likely improve travel management by reducing user and resource conflicts, while added processing requirements could increase the time needed to approve new projects and result in site-specific increases in congestion if portions of the current route system become overcrowded. Alterations to the larger transportation system may be required to accommodate

future route construction in GRSG population areas if they exceed the disturbance cap. Because fire would not count toward the disturbance cap under Alternative B, none of the population areas currently exceed the disturbance cap (see **Appendix L**, Baseline Disturbance Inventory). Future restrictions on route construction could occur as population areas reach the disturbance cap threshold. This would limit long-term expansion of the travel system, but is not expected to result in congestion or other access concerns because of the dispersed nature of the travel system in these areas.

Alternative C would result in the greatest reduction in access when compared with Alternative A. For example, under Alternative C, motorized cross-country travel would be prohibited in all GRSG habitat areas. Additionally, a portion of mapped important seasonal habitats (i.e., nesting, brood-rearing, and winter habitats) would be closed to OHV travel. Closures would occur in portions of these habitats throughout the planning area with the largest concentrations of closed areas within the Box Elder and Uintah Population Areas. While the majority of the closed areas are absent mapped routes, there are some existing or designated routes in the areas identified for closure. Furthermore, new road construction within 4 miles of active leks would be prohibited. Upgrading existing routes in mapped occupied habitat where such action would damage GRSG habitat would also be precluded. Together, these actions would result in site-specific losses of opportunity for OHV travel and future route construction and improved access. Alterations to the larger transportation system may be required to accommodate future route construction in GRSG population areas that exceed the disturbance cap outlined in. Because fire is included in the disturbance cap under Alternative C, three population areas currently exceed the disturbance cap (see **Appendix L**). This would limit long-term expansion of the travel system, but is not expected to result in congestion or other access concerns because of the dispersed nature of the travel system in these areas.

Under Alternative D, areas in PHMA that currently do not have designated routes would be designated in a travel management plan. In those areas managed as limited to existing routes, impacts on travel and transportation management under Alternative D would be the same as Alternative B. Impacts on future route construction would be similar to Alternative B. Because the disturbance cap threshold is higher under this alternative, future impacts are less likely to occur or would more likely occur later in time than under Alternative B.

Alternative E would designate mapped GRSG habitat in SGMAs/core areas with nesting and winter habitat that do not have designated routes in a travel management plan as limited to existing routes. Impacts on travel and transportation management under Alternative E would be the same as Alternative B, but would occur across a smaller area. The types of impacts on future route construction would be similar to Alternatives B and D. However, the disturbance cap would only apply or be calculated for new disturbances and would be set at 5 percent (including fire, but excluding vegetation treatments). Depending upon wildfire frequency and size, future impacts are less likely to occur or would more likely occur later in time than under Alternatives B and D.

Impacts from implementing the Proposed Plans would be similar to those under Alternative D, except that allocating 525 acres open to cross-country OHV use on BLM-administered land (one area each in the Parker Mountain and Uintah Population Areas) would preserve this type

of access in the long term. There would be slight (approximately one percent) differences from Alternative D in the number of acres allocated as limited to existing routes, limited to designated routes, and closed to OHV use, and, as a result, the impacts from these allocations would be similar to those under Alternative D. The types of impacts on future route construction from the 3 percent anthropogenic disturbance cap in PHMA would be the same as under Alternative D. The adaptive management strategy described in **Appendix B** could limit route construction and maintenance over the short or long term if travel-related ROWs are found to be a causal factor in not meeting GRSG conservation objectives.

4.19 LANDS AND REALTY

4.19.1 Methods and Assumptions

While solar and wind developments are permitted via ROWs, analysis of impacts on these resource uses is discussed in **Section 4.20**, Renewable Energy.

Indicators

Indicators of impacts on lands and realty are as follows:

- Acres of surface ownership in the planning area
- Acres of ROW restrictions (i.e., avoidance and exclusion areas)
- Number, acres/miles, and types of ROWs, permits, and leases, including communication site leases and ancillary access
- Number and type of land tenure/landownership adjustments (i.e., lands identified for disposal, withdrawal, acquisition, exchange, purchase, donation, and ROW acquisition)

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- National Forest System lands, a ROW is typically used to grant use of National Forest System land for a roadway or to accommodate the access needs for the protection, development, and use of lands and resources owned by private individuals or administered by public agencies. The Forest Service issues and administers SUAs when authorizing the uses on National Forest System lands that contribute to the national infrastructure for generating and transmitting energy resources such as an electrical transmission line or gas pipeline for electrical transmission lines and gas pipelines. Accordingly, for an electrical transmission line or gas pipeline, a BLM ROW grant is equivalent to a Forest Service SUA.
- The term ROW includes BLM ROWs, land leases, and permits, and Forest Service SUAs, as applicable. Under the Proposed Plans, the Forest Service would not make new decisions for SUAs (i.e., any decisions from Alternative A would be carried forward to the Proposed Plans). As such, acreages associated with ROW exclusion and avoidance are specific to BLM-administered lands except where current Forest Service decisions are carried forward.

- Existing ROWs, designated utility corridors, and communication sites would be managed to protect valid existing rights.
- On renewal, assignment, or amendment of existing ROWs, permits, and leases, additional stipulations could be included in the land use authorization.
- Maintaining and upgrading utilities, communication sites, and other ROWs is preferred before the construction of new facilities in the decision area, but only if the upgrading can be accommodated within the existing ROW.
- Activities on dispersed private parcels within the planning area would continue to require new or upgraded access, communication, and utility services.
- Federal energy policy (42 USC Section 13201 et seq. [2005]), would continue to support domestic energy production, including renewable energy such as wind and solar.
- A central focus of the BLM and Forest Service lands and realty programs in Utah would continue to be management for regional and interstate transmission lines through the state, particularly those needed to transport wind energy from Wyoming and the Dakotas to population centers in the southwest. Applications for high voltage (100 kV or greater) lines would increase in response to new wind energy development and corresponding energy demand in urban areas such as Phoenix, Las Vegas, and southern California.
- The number of ROW applications for new communication and computer technology, such as fiber optic cable, would continue to increase.
- Where demand for new ROWs exists on public lands, restricting ROW development in those areas would likely redirect ROW development to adjacent nonfederal or non-GSRG habitat federal land areas to accommodate the demand where feasible.
- Power lines and other vertical structures in areas naturally devoid of perching opportunities provide a perch for raptors and subsequently increase the potential for GRSG to abandon leks (Ellis 1984). Mitigation in the form of burying lines or including non-perching design features on lines would reduce perching opportunities and subsequent impacts on GRSG (Connelly et al. 2000).
- In accordance with the Omnibus Public Land Management Act of 2009 [Public Law 111-11], the BLM and Forest Service would continue to manage all previously withdrawn lands as withdrawn from entry, appropriation, or disposal under the public land laws. The BLM and Forest Service would review withdrawals as needed and when necessary, make recommendations for extensions, modifications, revocations, or terminations.

Implementing management for the following resources would have negligible or no impact on lands and realty, and are therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, and Recreation.

4.19.2 Alternative A

Greater Sage-Grouse Management

GRSG management actions have been incorporated in recently adopted LUPs, such as the Vernal RMP and Uinta LRMP. Management for GRSG habitat protection in these areas includes the placement of buffers ranging from 0.5 to 3.1 miles around leks and seasonal restrictions on surface-disturbing activities in winter habitat. Within the portions of the decision area where these management actions apply, impacts on the lands and realty program would include additional siting criteria for ROWs proposed adjacent to leks or within breeding or nesting habitat, RDFs for certain types of infrastructure, and extended processing times to review ROW applications for compliance with GRSG habitat management objectives. In the portions of the decision where existing LUPs do not contain GRSG management actions, there would be no impacts on lands and realty under Alternative A.

Travel and Transportation

Under Alternative A, 797,000 acres of mapped occupied habitat would be open to cross-country OHV travel, while 1,655,100 acres would be limited to existing (437,400 acres) or designated (1,217,700 acres) routes. Accordingly, existing transportation routes would continue to provide motorized access to ROW infrastructure and communication sites for construction and maintenance with no additional impacts on lands and realty from travel and transportation management.

Lands and Realty (Land Tenure)

Land tenure adjustments are intended to maintain or improve the efficiency of BLM and Forest Service management. Under Alternative A, approximately 24,400 acres would be available for disposal via sale. Land disposal, which must meet the criteria under FLPMA Section 203 and applicable LUPs, would improve the BLM-administered and National Forest System lands and realty programs and overall management efficiency.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative A, existing and identified ROWs in mapped occupied habitat would continue to provide opportunities for collocation of new infrastructure. A total of 67,200 acres would continue to be managed as ROW avoidance areas and 27,600 acres managed as ROW exclusion areas within mapped occupied habitat. Avoidance designations require ROW applicants to meet additional project criteria, which could influence project location, delay availability of energy supply (by delaying or restricting pipelines, transmission lines, or renewable energy projects), or delay or restrict communications service availability. Within exclusion areas, new ROW development is prohibited, which prevents the lands and realty program from approving new applications within these areas. Impacts under Alternative A would continue within avoidance and exclusions areas; however, these restrictions would prevent the BLM or Forest Service from accommodating future demand for ROW development within the decision area.

Under Alternative A, there are 177,700 acres of designated ROW corridors. These corridors would continue to be the preferred locations for new ROW development. Under this alternative, designated corridors would provide adequate opportunities to accommodate future demand for ROW development within the decision area.

BLM-administered and National Forest System lands would continue to be available for multiple-use and single-use communication sites and road access ROWs on a case-by-case basis pursuant to Title V of FLPMA and 43 CFR 2800 regulations. All ROW applications would be reviewed using the criteria of collocating new ROWs adjacent to existing ROWs wherever practical and avoiding the proliferation of separate ROWs. Collocation reduces land use conflicts and additional land disturbance and demarcates the preferred locations for utilities, therefore simplifying processing on BLM-administered and National Forest System lands.

Wind ROWs

Wind energy projects would be permitted through the ROW permitting process. For wind energy development under Alternative A, 27,600 acres in mapped GRSG habitat are managed as ROW exclusion and 67,200 acres are managed as ROW avoidance. In areas outside GRSG habitat, but within the population areas, 74,900 acres are managed as ROW exclusion and 50,800 acres are managed as avoidance.

ROW exclusion and avoidance designations decrease the amount of land available for new development. Refer to **Section 4.20** for additional information regarding impacts on wind energy development. Under Alternative A, management would provide sufficient opportunities to accommodate future wind energy development within the decision area. Therefore, there would be little to no impacts on wind energy development under Alternative A.

The Forest Service has not identified avoidance, exclusion, or open areas for wind energy development because, to date, wind energy development on National Forest System lands has been minor.

Mineral Development (including geothermal)

Mineral development indirectly impacts the lands and realty program through the requirement for new infrastructure development, such as roadways and communication facilities. In mapped occupied habitat under Alternative A, 3,866,200 acres of nonenergy mineral leasing, 3,977,400, acres of mineral materials development, and 3,822,661 acres of fluid mineral leasing (subject to stipulations) would continue to be open to new leasing, New mineral development in open areas would continue to place a small and variable demand on the lands and realty program. Because less than 1 percent of mapped GRSG habitat would be managed as ROW exclusion, the BLM-administered and National Forest System lands and realty programs would be able to accommodate new ROW development associated with mineral activity. Therefore, little to no impacts on lands and realty from mineral development would occur under Alternative A.

4.19.3 Alternative B

Greater Sage-Grouse Management

Alternative B management to protect GRSG habitat would impact lands and realty through the closure of areas to ROW authorizations, establishment of a 3 percent disturbance cap, application of additional criteria for land tenure adjustments, and limitations on new mineral development and road construction. This management would prevent the BLM and Forest Service from accommodating new ROW development in PHMA and would require additional development stipulations and siting criteria in other areas of occupied habitat, thereby reducing energy and communication opportunities in the decision area to meet a growing public demand.

Travel and Transportation

Under Alternative B, new roads in PHMA would be allowed only where access to valid existing rights is necessary and does not currently exist. Construction of new roads to access valid existing rights that are not yet developed would be done using minimum specifications. The surface disturbance associated with any newly constructed road would be added to the total surface disturbance in PHMA. If the disturbance exceeds 3 percent, the BLM and Forest Service would require additional mitigation to offset impacts on GRSG habitat as part of any new road ROW application. Limitations on new road construction and the incorporation of supplemental mitigation requirements could make certain areas impractical for new ROW development, particularly in areas not readily accessible via existing roadways, which would decrease the demand for new ROW authorizations in those areas. Refer to **Section 4.18**, Comprehensive Travel and Transportation Management, for further analysis.

Lands and Realty (Land Tenure)

Under Alternative B, federal lands would be retained in public ownership in PHMA except where land tenure adjustments would result in more contiguous federal ownership patterns or where disposal accompanied by a habitat mitigation agreement or conservation easement would result in more effective management of GRSG habitat. In GHMA, the amount of land available for disposal (5,490 acres) would be the same as under Alternative A. Land disposal would be subject to the criteria in FLPMA Section 203. Limitations on BLM and Forest Service land tenure/landownership adjustments, such as restrictions on land disposal to retain GRSG habitat in public ownership, could result in decreased management efficiency. Land tenure adjustments that result in a more contiguous ownership pattern would allow the BLM and Forest Service to provide more consistent management actions across larger portions of the decision area.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative B, new ROWs would be excluded on 2,784,200 acres within mapped occupied GRSG habitat and within population areas where anthropogenic disturbances exceed 3 percent. Managing PHMA as ROW exclusion would prevent the BLM and Forest Service from accommodating new ROW development in those areas. With a continuing demand for new ROWs in the planning area, including major inter- and intra-state electrical transmission and gas pipelines, ROW developments would be diverted to adjacent nonfederal lands or prevented altogether. If new ROW development, particularly inter-state electrical transmission, fiber optic, and gas pipelines could not be feasibly developed due to ROW exclusion areas, the result would be reduced energy and communication opportunities to meet growing demand until alternative routes (e.g., on nonfederal land or federal lands outside occupied GRSG habitat) or technology could be developed.

Additionally, the BLM and Forest Service would continue to designate 130,200 acres of ROW corridors in PHMA while un-designating 47,500 acres of ROW corridors that currently do not contain any authorized ROWs, resulting in a 27-percent reduction in the total designated corridor area in PHMA. Corridors are planning tools that direct future ROW development to preferred locations. Corridors are open to ROW development, subject to standard design criteria and stipulations. Un-designating corridors would further limit opportunities for ROW development within GRSG habitat and prevent the BLM and Forest Service from accommodating future demand for ROW development.

GHMA in the decision area would be managed as ROW avoidance. Within avoidance areas, the BLM and Forest Service would continue to process ROW applications, but would require additional requirements prior to authorizing the ROW. Supplemental design criteria and siting limitations would decrease the amount of future ROW development in avoidance areas.

Within exclusion areas, the BLM and Forest Service would only consider new ROW authorizations where the proposed infrastructure, including construction and staging during construction, could be collocated entirely within the footprint of an existing ROW. The BLM and Forest Service would require collocation in GHMA where possible. Impacts on the lands and realty program under Alternative B would include the need to locate proposed facilities outside exclusion areas or within existing ROWs, which limits the BLM's and Forest Service's ability to accommodate the demand for new infrastructure development, including any wind energy development. Additionally, under Alternative B, the BLM and Forest Service would take advantage of opportunities to remove, bury, or modify existing power lines. Limitations on new ROWs and aboveground linear features, such as transmission lines and pipelines, could restrict the availability of energy or service availability and reliability for communication systems. Where underground placement of power lines is determined to be the preferred option to minimize impacts on GRSG habitat, technical (e.g., engineering and service reliability) and financial limitations could preclude ROW development in those areas. Refer to **Section 4.3** for analysis of the impacts of burying power lines on GRSG.

Wind ROWs

Under Alternative B, 2,784,200 acres of PHMA would be managed as ROW exclusion for all ROWs, including utility-scale wind energy. Management of PHMA as ROW exclusion would substantially decrease the BLM's and Forest Service's ability to accommodate any new wind energy development demand in GRSG habitat areas. However, of the total areas statewide considered developable (i.e., wind speeds greater than 7 meters per second), 19 percent are located within mapped GRSG occupied habitat. Therefore, excluding wind energy development in PHMA would reduce but not eliminate wind energy development potential within the state. Refer also to **Section 4.20** for additional impacts analysis for wind energy development.

Surface Disturbance Cap

Under Alternative B, the total surface area covered by anthropogenic disturbances (e.g., power lines, communication towers, roads, railroads, oil and gas wells, mineral material sites, coal mines, and locatable mineral sites) would be limited to 3 percent within each population area. If surface disturbance in a population area exceeds 3 percent, then no new surface-disturbing activities would be allowed in that area. Future restrictions on ROW development and communication facility leasing would occur in population areas where disturbances exceed the disturbance cap. Impacts from excluding new ROW would be the same as those described above.

Neither the ROW avoidance and exclusion area criteria nor the 3 percent disturbance cap proposed under Alternative B would directly affect valid existing rights. Existing development would be allowed to continue operation, subject to RDFs upon renewal or reauthorization, in their existing footprints. Any expansion of a valid existing operation outside of an exclusion area would be subject to the ROW avoidance criteria and would be required to mitigate any new

surface disturbance. In some cases where a valid existing right exists within an unfragmented area of GRSG habitat, avoidance criteria and RDFs may by default indirectly limit access to and subsequent development of that right.

Mineral Development (including geothermal)

Alternative B would decrease the demand for new ROW infrastructure to support new mineral development. Under Alternative B, management to protect GRSG habitat would result in the closure of PHMA to nonenergy leasable minerals, surface coal mining, mineral material sales, and oil and gas leasing. Prohibitions on new mineral development would decrease the number of ROW applications received by the BLM and Forest Service for roads, distribution lines, and related infrastructure necessary to support mineral activity. This impact would be especially notable to the south and southeast of the Wasatch Front where coal development potential is high. ROWs serving existing mineral development sites would continue to place demand on the lands and realty program (e.g., for renewals and applications to upgrade or maintain infrastructure). Under Alternative B, lands and realty programs would continue to process ROW applications associated with valid existing rights. ROW applications that require expansion of existing infrastructure beyond existing ROW footprints would not be authorized. Refer to **Section 4.21**, Minerals, for further analysis related to mineral development.

Withdrawals

Under Alternative B, the BLM and Forest Service would propose for mineral withdrawal 3,650,900 acres within PHMA. However, withdrawal would be subject to secretarial order. The BLM and Forest Service would not recommend approval of withdrawals for reasons other than mineral activity unless justified by adequate GRSG conservation measures. Mineral withdrawal would reduce the number of new ROW authorization requests for infrastructure to support mineral activity. Reduced demand for new ROWs associated with mineral activity would, however, partially offset the impact of managing PHMA as ROW exclusion. Refer to **Section 4.21** for further analysis related to mineral development.

4.19.4 Alternative C

Greater Sage-Grouse Management

Management actions under Alternative C to protect GRSG habitat would impact lands and realty through the closure of all mapped occupied GRSG habitat (3,313,800 acres) to new ROW authorizations, additional criteria for land tenure adjustments, and limitations on new mineral development and road construction. This management would prevent the BLM and Forest Service from accommodating new ROW development in all mapped occupied habitat, thereby eliminating energy and communication development opportunities in those areas. Prohibitions on new road ROW authorizations in PHMA would further limit opportunities for infrastructure development that relies on roadways for access.

Travel and Transportation

Under Alternative C, a portion of mapped occupied habitat would be closed to OHV travel and new road construction would be prohibited within 4 miles of active leks in PHMA. Because of the density of active lek sites, new road construction would be limited throughout many areas in all mapped occupied habitat. Limitations on new road construction and closure of some existing

routes would limit the BLM's and Forest Service's ability to authorize new and modify existing ROW applications in PHMA. Prohibitions on new road ROW authorizations in PHMA would impact other resource uses (e.g., mineral development and infrastructure) that require roads for access. Refer to **Section 4.18** for further analysis.

Lands and Realty (Land Tenure)

Under Alternative C, federal lands would be retained in public ownership in PHMA with no exceptions. Impacts from land tenure would be the same as Alternative B.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative C, new ROWs, including large-scale inter-state transmission lines anticipated to cross the planning area to transmit energy generated in adjacent states to demand centers throughout the west, would be excluded in all mapped occupied habitat (3,313,800 acres); therefore, no areas in mapped habitat would be open to new ROW development. Additionally, all currently designated ROW corridors (177,700 acres) within mapped occupied habitat would be un-designated. Impacts on ROW authorizations would be similar to Alternative B, but would apply to a larger land area, and there would be no designated corridors to accommodate new ROW infrastructure. Impacts under Alternative C from managing all mapped occupied habitat as ROW exclusion would be similar to Alternative B, except that under Alternative C, no new ROW developments would be authorized in mapped occupied habitat. Therefore, Alternative C would further reduce opportunities for renewable energy, communication facilities, gas pipelines, fiber optic cables, electrical transmission lines, and similar ROW development from occurring in the decision area. There is a continuing demand for these ROWs in the planning area to meet energy and communication needs outside the planning area; Alternative C would prevent the BLM and Forest Service from meeting those needs.

Wind ROWs

Management of all mapped GRSG occupied habitat as ROW exclusion would eliminate the BLM's and Forest Service's ability to accommodate any new wind energy development demand in those areas. Therefore, Alternative C would result in a 19-percent decrease in the total number of acres in Utah with sufficient wind resources to be considered developable. ROW exclusions would also limit development on adjacent nonfederal land where transmission infrastructure would be needed across BLM-administered or National Forest System lands. Refer also to **Section 4.20** for additional impacts analysis for wind energy development.

Mineral Development (including geothermal)

Impacts under Alternative C from mineral development would be similar to Alternative B, with the exception that all mapped occupied habitat (4,008,580 acres) would be withdrawn from mineral entry. Prohibitions on new mineral development across such a large area would decrease the number of ROW applications received by the BLM and Forest Service to support mineral activity. This impact would be especially notable in areas where coal development potential is higher, such as east of the Wasatch Front. Refer to **Section 4.21** for further analysis related to mineral development.

Withdrawals

Under Alternative C, all mapped occupied habitat, including surface and split-estate (4,008,580 acres), would be recommended for withdrawal from locatable mineral entry. Impacts under

Alternative C from withdrawals would be similar to Alternative B, except that mineral withdrawal would apply to all mapped occupied habitat. Mineral withdrawal in mapped occupied habitat would further reduce the number of new ROW authorization requests for infrastructure to support mineral activity. Reduced demand for new ROWs associated with mineral activity would, however, partially offset the impact of managing occupied as ROW exclusion. Refer to **Section 4.21** for further analysis related to mineral development.

Other Actions

Under Alternative C, the BLM and Forest Service would designate a combination of 15 new ACECs and zoological areas on 1,834,200 acres. Management of the ACECs and zoological areas would be tailored to protect the relevant and important values (e.g., GRSG habitat) for which the areas would be designated. All lands within the ACECs and zoological areas would be managed as ROW exclusion; therefore, BLM and Forest Service management of lands and realty would be similar inside the ACEC or zoological area boundary as it would be in PHMA outside. However, within the boundaries, the BLM and Forest Service would prioritize the removal of infrastructure, including unnecessary roads and other equipment, consistent with valid existing rights. Impacts from ROW exclusion are the same as those described for exclusion areas under Alternative B. Identification of unnecessary infrastructure would require the BLM and Forest Service to inventory existing ROWs to determine which ones are no longer needed and require further collaboration and oversight during the removal of the infrastructure. Identification and removal of unneeded infrastructure would, however, improve the efficiency of the lands and realty program by concentrating management efforts on critical ROWs and functioning infrastructure.

4.19.5 Alternative D

Greater Sage-Grouse Management

By prescribing specific management for certain types of ROWs, Alternative D would enable the BLM and Forest Service to accommodate increasing demand for ROW development, including inter-state electrical transmission, fiber optic, and gas pipelines, while protecting GRSG habitat, particularly buffer areas surrounding lek sites. While impacts under Alternative D would be similar to those under Alternative B, by designating areas for ROW development, establishing a 5 percent (rather than 3 percent) surface disturbance cap, and allowing mineral development in more areas subject to stipulations, Alternative D would allow for more ROW and mineral development than Alternative B. Impacts on lands and realty under Alternative D would be a decreased ability to accommodate site and linear ROW development, especially aboveground ROWs and ROWs outside designated corridors. Although less restrictive than Alternative B, limitations on new mineral development and road development under Alternative D would further reduce the potential for new ROW development in the decision area.

Travel and Transportation

Impacts on the lands and realty program under Alternative D would be the same as those described above under Alternative B. Refer to **Section 4.18** for further analysis.

Lands and Realty (Land Tenure)

Under Alternative D, federal lands would be retained in public ownership in PHMA with no exceptions, while allowing 5,540 acres in GHMA for disposal. As a result, impacts on lands and realty from land tenure would be the same as Alternative B.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative D, the BLM and Forest Service would manage for ROW development based on the type of ROW and location within the planning area (i.e., proximity to existing lek sites). Unless within a designated corridor, aboveground linear ROWs within 4 miles of a lek located in PHMA would be excluded, resulting in 1,422,300 acres of ROW exclusion in mapped occupied habitat. Areas beyond 4 miles of a lek, within mapped occupied habitat or areas outside GRSG habitat and within a 4-mile lek buffer would be managed as avoidance areas. The result would be 1,368,900 acres of avoidance area. New ROW development in the avoidance area would be required to comply with criteria to protect GRSG populations (see the description under Alternative D in **Table 2.4** for a list of avoidance area criteria). The BLM and Forest Service would deny actions not able to comply with avoidance criteria.

The BLM and Forest Service would manage 2,754,200 acres (83 percent) of PHMA as ROW avoidance for underground (e.g., pipelines and electrical lines) or on-ground ROWs (e.g., pipelines and roads). Development of new underground or on-ground ROWs could occur if the ROW applicant could meet the criteria listed in **Table 2.4**. Impacts on lands and realty from restrictions on infrastructure development within avoidance areas would be the same as those described in Alternative B.

Alternative D would impact the BLM and Forest Service lands and realty programs by reducing the agencies' ability to authorize aboveground linear ROWs, such as electrical transmission lines, on 51 percent of PHMA. On the remaining 49 percent of PHMA, additional stipulations for the development of electrical transmission lines could result in denial of projects that cannot meet ROW grant requirements for the protection of GRSG habitat. To meet demand for new energy and communication infrastructure, some aboveground ROW development would likely be diverted to adjacent nonfederal lands on non-GRSG habitat federal land.

Alternative D could also result in an increase in the number of underground ROW applications received as ROW applicants seek opportunities to place ROW infrastructure in areas otherwise excluded for aboveground infrastructure. Even where new underground placement meets the criteria in **Table 2.4**, technical (e.g., engineering and service reliability) and financial limitations could preclude ROW development depending on specific topographic constraints in those areas. Refer to **Section 4.3** for analysis of the impacts of burying power lines on GRSG.

For aboveground site-type ROWs (e.g., communication towers), excluding wind facilities, all areas within 1 mile of an occupied lek located in PHMA would be managed as exclusion. PHMA beyond 1 mile of a lek located in PHMA would be managed as avoidance. Areas outside PHMA but still within the 1-mile buffer would also be exclusion areas (see **Table 2.4** for a list of avoidance area criteria). The result would be 219,900 acres of exclusion and 2,562,000 acres of avoidance areas. While Alternative D would impact the BLM and Forest Service lands and realty programs by reducing the agencies' ability to authorize communication towers adjacent to leks, impacts on communication services would only result when a ROW application could not find

another suitable location, not meet the stipulations in the avoidance areas, or the stipulations in avoidance areas would diminish the effectiveness of the communication infrastructure to the point where the development would not be practical. In GHMA, all areas within 1 mile of an occupied lek located in GHMA would be managed as avoidance areas for new ROWs. Approval of new development would be subject to the criteria listed in **Table 2.4**. GHMA beyond 1 mile of a lek would be open to new ROW development, subject to coordination with UDWR and implementation of RDFs. In avoidance areas, impacts on lands and realty from restrictions on infrastructure development would be the same as those described in Alternative B. In open areas beyond 1 mile of a lek, coordination with UDWR and agreement on appropriate RDFs could extend processing times for ROW applications.

Table 2.3 shows potential management of each ROW type under Alternative D for areas within mapped GRSG habitat.

Table 4.21 summarizes management of each ROW type under Alternative D for areas that are within the population areas but outside occupied GRSG habitat.

Table 4.21
Acres of ROW Management in Population Areas outside of GRSG Habitat, Alternative D

	ROW Type		
	Above-Ground Linear	**Underground Linear**	**Above-ground Site (non-wind or solar)**
Open	1,925,900	2,337,000	2,337,100
Avoided	462,500	58,200	51,700
Excluded	81,700	74,900	81,300

Source: BLM 2012d

Under Alternative D, the BLM and Forest Service would retain 89,400 acres of existing designated ROW corridors with no new development stipulations and 48,400 acres of existing designated ROW corridors where new development would be limited to underground placement only. They would also designate 31,700 acres as new ROW corridors, while un-designating 39,700 acres. Within exclusion areas, new aboveground linear ROWs would be allowed only in those designated ROW corridors where underground stipulations would not apply. Corridors wider than 3,500 feet would not be allowed. The need to locate proposed facilities within designated corridors in exclusion areas would decrease the amount of federal land available to accommodate new infrastructure development. These restrictions could redirect some new ROW development to adjacent nonfederal lands or non-GSRG habitat federal land. However, new corridor designations in GRSG habitat would improve the ability of the BLM and Forest Service to plan for and evaluate ROW applications, and manage approved ROW authorizations, while managing for the protection of GRSG habitat. Identification of corridor locations and associated development stipulations would enable the BLM and Forest Service to provide additional certainty for potential ROW applicants seeking ROW locations within GRSG habitat.

Wind ROWs

Under Alternative D, 2,781,900 acres of mapped GRSG habitat would be managed as ROW exclusion and 9,400 acres as avoidance for utility-scale wind energy. Outside mapped occupied GRSG, but within population areas, 82,400 acres would be managed as ROW exclusion and 462,500 as avoidance. All wind energy development would be excluded within 1 mile of an occupied lek in PHMA. Impacts on wind energy ROWs under Alternative D would be similar to Alternative C, with the exception that additional exclusion and avoidance criteria would apply to areas outside mapped occupied habitat. Accordingly, Alternative D would impact the additional 12,600 acres of wind energy areas within population areas but outside occupied habitat considered developable due to wind speeds greater than 7 meters per second by limiting or preventing the approval of new wind energy development in those areas. Refer also to **Section 4.20** for additional impacts analysis for wind energy development.

Surface Disturbance Cap

Under Alternative D, the total surface area covered by anthropogenic disturbances would be limited to 5 percent within each population area. If surface disturbance in a population area exceeds 5 percent, then no new surface-disturbing activities would be allowed in that area. Future restrictions on ROW development and communication facility leasing would occur in population areas where disturbance exceeds 5 percent, respectively. Impacts from excluding new ROW would be the same as those described above.

Impacts on valid existing rights would be the same as those under Alternative B.

Mineral Development (including geothermal)

Impacts under Alternative D from mineral development would be similar to Alternative B, with the exceptions that underground coal mining would be allowed in GRSG habitat with stipulations specifically related to surface disturbance; GRSG habitat would be open to noncommercial mineral material development; and fluid mineral development would be allowed on 1,829,980 acres subject to CSU and/or TL stipulations. A 5 percent disturbance cap under Alternative D, compared to 3 percent under Alternative B, would also allow for more mineral activity. New mineral development in PHMA would place a demand on the lands and realty program through the need for new or modified ROW authorizations. Refer to **Section 4.21** for further analysis related to mineral development.

Withdrawals

There would be no impacts from withdrawals under Alternative D.

4.19.6 Alternative E

Greater Sage-Grouse Management

Management actions under Alternative E to protect GRSG habitat would impact lands and realty through the placement of limitations on areas for new ROW authorizations. Avoidance area designations on 98 percent (2,654,000 acres) of mapped GRSG habitat in SGMAs/core areas would limit new ROW development in those areas or divert it to adjacent nonfederal lands unless ROW applicants could meet supplemental design criteria and siting requirements. Where these requirements could not be met, there could be reduced energy and communication opportunities to meet growing demand.

Travel and Transportation

Impacts on the lands and realty program under Alternative E would be the same as those described above under Alternative B. Refer to **Section 4.18** for further analysis.

Lands and Realty (Land Tenure)

There would be no impact on lands and realty from land tenure requirements under Alternative E.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative E, the total area managed as ROW exclusion (27,600 acres) would be the same as Alternative A, while 98 percent (2,654,000 acres) of mapped GRSG habitat in SGMAs/core areas under Alternative E would be managed as ROW avoidance. New ROWs would continue to be allowed on 632,200 acres within mapped GRSG habitat.

In areas outside occupied GRSG habitat but within population areas, management would be the same as Alternative A. Approximately 103,200 acres would be managed as ROW avoidance, and 2,292,000 acres would be open to new ROW development, including wind. Additionally, collocation would be required in GRSG habitat, where possible.

Management of mapped GRSG habitat outside SGMAs/noncore areas and subsequent impacts on lands and realty would be the same as Alternative A.

Under Alternative E2, all core areas would be managed as exclusion areas for new Forest Service SUAs. Noncore areas would be managed as avoidance areas for new Forest Service SUAs, except for areas currently managed as SUA exclusion areas. New Forest Service SUAs in noncore areas would be co-located within existing SUAs, where possible.

Management of 98 percent of mapped GRSG habitat in SGMAs/core areas under Alternative E as ROW avoidance would require ROW applications to meet additional stipulations for the protection of GRSG habitat, which could result in the denial of projects that cannot meet these requirements. Stipulations include no permanent disturbance within 1 mile of an occupied lek (unless the disturbance is not visible to the GRSG), no permanent disturbance within occupied leks, and justification from the ROW applicant as to why development is required in the avoidance area and cannot be placed elsewhere. Accordingly, although new development could be authorized, the stipulations associated with avoidance areas under Alternative E would limit the ability to accommodate the demand for new infrastructure development in GRSG habitat. With demand for new ROWs in the planning area, including major inter- and intra-state electrical transmission and gas pipeline ROW developments, expected to continue and increase over time, new ROW development would be diverted to adjacent nonfederal lands or would not occur at all. If new ROW development could not be feasibly developed, the result would be reduced energy and communication opportunities to meet growing demand.

Wind ROWs

Under Alternative E, 2,654,000 acres in mapped GRSG habitat would be managed as ROW avoidance, while 632,200 would be open to new wind energy development, and 27,600 would continue to be exclusion. Although wind energy ROWs could be approved in GRSG habitat under Alternative E, additional siting requirements and design criteria would decrease the

likelihood for development on BLM-administered and National Forest System lands, especially where favorable wind energy potential exists on adjacent nonfederal land. Outside GRSG habitat, but within population areas, impacts would be similar to Alternative A, with the exception that under Alternative E, an additional 52,400 acres would be ROW avoidance with subsequent impacts on the abilities of the BLM and Forest Service to accommodate wind energy demand in those areas. Refer also to **Section 4.20** for additional impacts analysis for wind energy development.

Mineral Development (including geothermal)

New or expanded mineral development, which places a demand on the lands and realty program through applications for ROW authorizations, would be allowed under Alternative E with stipulations to mitigate impacts on GRSG populations. Stipulations may affect the location, size, and operations of mineral-development projects. Therefore, while the amount of land available for mineral development would be to the same as Alternative A, stipulations under Alternative E could reduce the number and distribution of ROW applications associated with new mineral-development projects. Refer to **Section 4.21** for further analysis related to mineral development.

Withdrawals

There would be no impacts from withdrawals under Alternative E.

4.19.7 Proposed Plans

Greater Sage-Grouse Management

The most notable impacts on the Lands and Realty program under the Proposed Plans would occur in PHMA. In addition to managing PHMA as avoidance areas for future land use authorizations, including ROWs, leases, and permits, the Proposed Plans would require discretionary surface-disturbing land use activities to:

- Achieve net conservation gain to GRSG,
- Incorporate RDFs,
- Avoid tall structures within key GRSG habitat areas,
- Meet noise requirements,
- Abide by lek buffer requirements, and
- Avoid disturbing more than 3 percent of a BSU and project area.

Collectively, these criteria could increase mitigation requirements, result in more complex designs, exclude infrastructure placement in the most cost effective locations, and result in overall greater development costs. The corresponding effect would likely be a reduction in the number of authorization applications received for activities in PHMA and longer, more complicated review periods for those that are proposed in PHMA. Implementation of the GRSG habitat conservation measures listed above could also limit new mineral development in PHMA, which would further reduce the demand for new ROW development in the decision area.

Less restrictive management for new land use authorizations in GHMA and in GRSG habitat outside of the decision area would allow for more ROW development, leases, and permits in those areas. However, because the Proposed Plans would still require discretionary surface-disturbing land use actions to achieve net conservation gain, incorporate RDFs, and abide by lek buffers, project proponents in GHMA would also be likely to seek less restrictive locations outside GRSG habitat or, if located in GHMA, incur added costs and longer project review periods.

The TransWest Express (including those portions of Energy Gateway South that are collocated) is not subject to the Proposed Plans decisions to designate PHMA as an avoidance area and to require net conservation gain, RDFs, and lek buffers in GHMA. The Obama Administration identified this transmission project as a priority project as part of the President's commitment to job creation and modernizing America's infrastructure. This transmission project was one of seven projects identified for expedited permit review and federal agency coordination among an interagency Rapid Response Team for Transmission established to foster coordination, expedite simultaneous permitting processes, and resolve permitting challenges, while ensuring appropriate environmental reviews.

The BLM is currently processing the application for TransWest Express (including those portions of Energy Gateway South that are collocated), a high-voltage transmission line, which includes alternatives through GRSG habitat. The BLM is analyzing conservation measures for GRSG as part of the review process for TransWest Express (including those portions of Energy Gateway South that are collocated).

TransWest Express (including those portions of Energy Gateway South that are collocated) is analyzed in detail in the cumulative impacts section of this LUPA.

Travel and Transportation

Planning level impacts on the lands and realty program under the Proposed Plans from travel and transportation would be the same as those described above under Alternative B. Refer to **Section 4.18** for further analysis. Subsequent travel management planning, which designates allowable uses on specific routes, could modify the availability of routes to support the lands and realty program.

Lands and Realty (Land Tenure)

The Proposed Plans would allow land disposal actions that result in a net conservation gain to GRSG and its habitat. By allowing realty actions that can demonstrate a benefit to GRSG and its habitat, the BLM and Forest Service could consolidate land ownership where applicable and improve overall land management efficiency.

Infrastructure Development (including all ROWs and utility corridors)

Under the Proposed Plans, the BLM and Forest Service would manage for ROW development based on the type of ROW (e.g., major or minor; linear or site) and location within the planning area. In PHMA, new ROWs, leases, and permits would be avoided if possible. New ROWs, leases, and permits (except for roads) would only be allowed in PHMA and GHMA where the proposal could demonstrate a net conservation gain to GRSG habitat and application of RDFs and other GRSG conservation strategies (e.g., tall structure limitations and buffering from leks)

intended to reduce impacts on GRSG habitat. New road ROWs in PHMA would be authorized only where necessary for public safety, administrative access, or subject to valid existing rights and would be collocated as close as technically possible to existing ROWs or where GRSG impacts are best minimized. Unless within a designated corridor, aboveground linear ROWs would be avoided on 1,997,000 acres of BLM-administered lands and 767,800 as restricted on National Forest System lands. In addition to meeting requirements for a net conservation gain for GRSG, ROWs in avoidance areas would be subject to strict design and siting criteria to ensure no impacts on GRSG. The BLM and Forest Service would deny projects that cannot meet ROW grant requirements for the protection of GRSG habitat, within PHMA. Adaptive management responses could further restrict ROW development by excluding high voltage transmission lines or major pipelines outside of corridors in PHMA or limiting the size of new lines within existing corridors. To meet demand, ROW development could be diverted to adjacent nonfederal lands or federal lands outside of PHMA. For projects approved in GRSG habitat, costs would likely be higher compared to areas outside GRSG habitat.

As ROW applicants seek opportunities to place ROW infrastructure in areas otherwise discouraged for infrastructure development, the Proposed Plans could also result in an increase in the number of ROW applications received that propose underground placement or collocation with other infrastructure. Even where new underground or collocated placement would achieve net conservation gain for GRSG habitat, technical (e.g., engineering and service reliability) and financial limitations could preclude ROW development depending on specific topographic constraints in those areas. Refer to **Section 4.3** for analysis of the impacts of burying power lines on GRSG.

The Proposed Plans would avoid site-type ROWs (e.g., communication towers) in PHMA, wherever possible and apply RDFs, lek buffers, and disturbance mitigation requirements to any development that would occur in PHMA. Wind energy generation facilities would be excluded in PHMA. While the Proposed Plans would impact the BLM and Forest Service lands and realty programs by reducing the agencies' ability to authorize communication towers if GRSG conservation measures are not met, impacts on communication services would only result when a ROW applicant could not find another suitable location, not meet the stipulations in the avoidance areas, or the stipulations in avoidance areas would diminish the effectiveness of the communication infrastructure to the point where the development would not be practical.

Table 2.3 shows potential management of each ROW type under the Proposed Plans for areas within mapped GRSG habitat.

One of the potential effects of restricting land use authorizations within GRSG habitat under the Proposed Plans would be the redistribution of development to portions of the planning area outside GRSG habitat. **Table 4.22** summarizes management of each ROW type under the Proposed Plans for areas that are within the population areas but outside occupied GRSG habitat.

No new ROW corridors would be designated under the Proposed Plans. The BLM and Forest Service would retain 25,100 acres of existing designated ROW corridors in PHMA with no new development stipulations and 44,400 acres of existing designated ROW corridors where new

Table 4.22
Acres of ROW Management in Population Areas outside of GRSG Habitat, Proposed Plans

	ROW Type		
	Above-Ground Linear	**Underground Linear**	**Above-ground Site (non-wind or solar)**
Open	1,151,900	933,000	2,084,900
Avoided	165,500	56,500	222,000
Excluded	73,900	0	73,900

Source: BLM 2015

development would be limited to underground placement only. They would also undesignated 33,200 acres of ROW corridors. While the first priority under the Proposed Plans would be to avoid new ROW development in designated corridors, the corridors would be preferred locations for new development compared to areas outside the corridors. Financial and technical feasibility concerns associated with collocating development in corridors could redirect some new ROW development to adjacent nonfederal lands or non-GSRG habitat federal land. However, new corridor designations in GRSG habitat would improve the ability of the BLM and Forest Service to plan for and evaluate ROW applications, and manage approved ROW authorizations, while managing for the protection of GRSG habitat. Identification of corridor locations and associated development stipulations would enable the BLM and Forest Service to provide additional certainty for potential ROW applicants seeking ROW locations within GRSG habitat.

Retaining 76,500 acres of existing corridors in GHMA would have similar benefits as described above for PHMA. However, fewer restrictions on land use authorizations in GHMA compared to PHMA would reduce the incentives for ROW developers to collocate with corridors.

Wind ROWs

Under the Proposed Plans, 2,797,100 acres of mapped GRSG habitat would be managed as ROW exclusion and 565,200 acres as avoidance or open for utility-scale wind energy. Impacts on wind energy ROWs under the Proposed Plans would be similar to Alternative D, with the exception that additional RDFs, lek buffer requirements, and mitigation requirements would apply to any development in areas that are not excluded. Refer also to **Section 4.20** for additional impacts analysis for wind energy development.

Surface Disturbance Cap

Under the Proposed Plans, the total surface area covered by anthropogenic disturbances would be limited to 3 percent within each BSU and project area. If surface disturbance in a BSU or project area exceeds 3 percent, then no new surface-disturbing activities (including ROW development and communication facility leasing) would be allowed in that area. Those impacts would continue until total disturbance within the BSU and project area falls below the cap.

Neither the ROW avoidance and exclusion area criteria nor the 3 percent disturbance cap (5 percent on National Forest System lands in Wyoming) proposed under the Proposed Plans would directly affect valid existing rights. Existing development would be allowed to continue

operation, subject to RDFs upon renewal or reauthorization, in their existing footprints. Any expansion of a valid existing operation outside of an exclusion area would be subject to the net conservation gain requirements, disturbance cap, and would be required to mitigate any new surface disturbance. In some cases where a valid existing right exists within an unfragmented area of GRSG habitat, GRSG conservation criteria and RDFs may indirectly limit access to and subsequent development of that right.

Withdrawals

Under the Proposed Plans, areas identified as SFA would be recommended for withdrawal from locatable mineral entry. Impacts on lands and realty would include a decreased demand for ROW development (e.g., roads, pipelines, and transmission lines) to support locatable mineral activities.

4.20 RENEWABLE ENERGY

4.20.1 Methods and Assumptions

While geothermal energy is considered a fluid leasable, it is discussed in this section instead of **Section 4.21**.

Reasonably Foreseeable Development Scenarios

RFD scenarios for wind and geothermal were developed within the population areas being analyzed, as follows.

Wind

It is projected that wind energy projects could occur within occupied habitat in the Bald Hills and Hamlin Valley Population Areas. The reasonably foreseeable wind projects are estimated to cover approximately 5,000 acres and have an electrical capacity of approximately 210 MW. Actual ground disturbance associated with these projects would be in the range of 250 to 500 acres.

Geothermal

It is possible that the existing Thermo Geothermal Field (currently, Cyrq-owned wells and generation plant) could expand in the future to include an adjacent 980-acre geothermal lease (UTU-087662) that is located within the Bald Hills Populated Area. Development of this lease is expected to comprise of drilling five geothermal energy production or produced fluid injection wells. With an estimated surface disturbance of 7 acres per well, including respective access roads and pipelines, a total of 35 acres of long-term surface disturbance would result.

This impact analysis analyzes the impacts on lands with good or better wind potential, and lands with moderate or high geothermal potential. This analysis also addresses the effects of the various alternatives on the specific wind and geothermal areas identified above in the RFD scenarios.

Solar

The Approved RMP Amendments/ROD for Solar Energy Development in Six Southwestern States (October 2012) excluded all GRSG occupied habitat to new utility-scale solar development. The existing BLM LUPs already exclude solar development in GRSG habitat and

the National Forest System lands would be excluded from solar ROW development; this plan amendment process does not need to make additional decisions related to solar development.

Indicators

Indicators of impacts on renewable energy are as follows:

- Acres of land with good or better wind potential within ROW exclusion areas
- Acres of land with good or better wind potential within ROW avoidance areas
- Restrictions on ROW development in GRSG habitat that would limit or preclude new transmission line development to support renewable energy generation projects
- The amount of land identified as closed to geothermal exploration and development
- The amount of land subject to NSO stipulations
- The amount of land subject to CSU and/or TL stipulations
- The application of lease notices for the protection of GRSG on new leases
- The application of COAs for the protection of GRSG on existing leases
- Restrictions on geothermal exploration in GRSG habitat

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- The term ROW includes BLM ROWs, land leases, and permits, and Forest Service SUAs, as applicable. Under the Proposed Plans, the Forest Service would not make new decisions for SUAs (i.e., any decisions from Alternative A would be carried forward to the Proposed Plans). As such, acreages associated with ROW exclusion and avoidance are specific to BLM-administered lands except where current Forest Service decisions are carried forward.
- Renewable energy resources include solar, wind, geothermal, and biomass facilities. The Solar Programmatic EIS specifically excluded identified GRSG habitat (occupied, brooding, and winter habitat) from BLM-administered lands in Utah that have been identified by the US Department of Energy as having solar energy capacity to support utility-scale facilities of 20 MW or larger. Therefore, utility-scale solar energy development will not be addressed or included in the analysis of this LUPA. For ROW applications to support non-utility-scale solar facilities (i.e., less than 20 MW), the BLM will consider such project requests on a case-by-case basis, which may require an LUPA to allow for an otherwise nonconforming proposal.
- Good or better wind potential is classified as wind speeds of 7.0 meters per second at 50 meter height or at greater wind turbine hub heights (e.g., 80 or 100 meters) or at wind power density of above 400 watts per meter (DOE 2012).
- Existing ROWs may be modified on their renewal, assignment, or amendment if the requested actions meet the objectives of the amended LUPs.

- ROW holders may continue their authorized use as long as they comply with the terms and conditions of their grant.
- The demand for ROWs would increase over the life of the amended LUPs.
- For wind resources, impacts on anticipated projects would only occur because of the change in management of lands within the Bald Hills and Hamlin Valley Population Areas, per the wind RFD scenario.
- Existing geothermal leases would not be affected by the closures proposed under this LUPA.
- Geothermal operations on existing federal leases, regardless of surface ownership, would be subject to COAs by the BLM and Forest Service Authorized Officer. The BLM and Forest Service can deny surface occupancy on portions of leases with COAs to avoid or minimize resource conflicts if this action does not eliminate reasonable opportunities to develop the lease.
- Valid existing geothermal leases would be managed under the stipulations in effect when the leases were issued; new stipulations proposed under this LUPA would apply only on new leases. See the glossary for definitions of stipulations versus COAs.
- If an area is leased, it could be developed; however, not all leases would be developed within the life of this LUPA.
- As the demand for energy increases, so will the demand for developing geothermal resources.
- Technological advancements, such as enhanced/engineered geothermal systems or commercial exploitation of moderate (lower) temperature reservoirs or deeper basin-centric reservoirs, could lead to changes in levels of geothermal mineral development potential throughout the planning area.
- Stipulations apply to geothermal leasing on all lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered and National Forest System lands and non-BLM-administered and non-National Forest System lands.
- For geothermal energy, the above criteria were evaluated in addition to areas closed to leasing, and areas with NSO, CSU, and TL stipulations. All of these factors are considered impediments to renewable energy development. Alternatives with greater acreages of such restrictions are considered to have a greater impact on renewable energy development potential than alternatives with fewer acres of such restrictions. For geothermal resources, impacts on anticipated projects would only occur because of the change in management of lands within the Bald Hills Population Area, per the geothermal RFD scenario.
- Restrictions on transmission line development within or adjacent to areas with renewable energy resource potential would result in diminished output capacity (e.g., fewer wind turbines) or prevent the energy resource from being developed.

Implementing management for the following resources to protect GRSG would have negligible or no impact on renewable energy and are therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, and ACECs.

4.20.2 Alternative A

Lands and Realty

Impacts on renewable energy projects are generally related to where ROW authorizations and geothermal leasing are allowed on leased lands. Impacts are also related to the mitigation measures required for specific project siting and special stipulations required for resource protection.

Wind energy projects and electrical transmission projects to connect both wind and geothermal energy projects to the grid can only occur on lands that are not ROW exclusion areas (see **Table 2.3** for a summary of acres of exclusion areas by alternative). Greater ROW exclusion acreages result in long-term direct impacts on the ability for wind and geothermal resources to be developed.

As discussed in **Section 4.19**, ROW applications may be filed within ROW avoidance areas; however, projects proposed in such areas may be subject to restrictions that would add application processing time and increased project costs. Greater ROW avoidance areas have short-term direct impacts (e.g., special surveys, reports, and construction and reclamation BMPs) and long-term direct impacts (e.g., potential operation and maintenance requirements) on the economic feasibility of the development of renewable energy resources. Because transmission lines are an essential element of renewable energy projects, there would be no opportunities for the development of renewable energy resources in areas where technical (e.g., engineering and reliability) and financial limitations associated with meeting ROW avoidance criteria preclude transmission line development.

Under Alternative A, zero acres of lands with good or better wind potential would be affected by ROW exclusion or avoidance areas or by management actions that would avoid or exclude new transmission line development. All lands with such potential would continue to be open for ROW applications on a case-by-case basis. **Table 4.23** provides an overview of impacts across alternatives on wind development potential through showing the number of acres of good or better (Class 4 or higher) wind potential within ROW exclusion and avoidance areas.

The areas in the wind RFD scenario in Hamlin Valley and Bald Hills Population Areas are open to ROW applications. Applications would likely be accepted by the BLM and Forest Service with few restrictions. However, if, GRSG becomes a federally listed species, then the ESA Section 7 consultation process would likely result in substantial project constraints.

The Forest Service has not identified avoidance, exclusion, or open areas for wind energy development because, to date, wind energy development on National Forest System lands has been minor.

Table 4.23
Acres of Good or Better Wind Potential that would be Managed as ROW Exclusion and Avoidance Areas

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
ROW Exclusion	0	12,600	35,500	12,600 plus within 1 mile of occupied leks	0	14,300
ROW Avoidance	0	22,900	0	Areas outside PHMA and within 4 miles of an occupied lek	12,600	0

Source: BLM 2012d, 2015

Mineral Development (including geothermal)

Geothermal energy cannot be developed in areas closed to leasing. In areas with NSO stipulations, geothermal resources can only be accessed by directional drilling from a point on the surface that is not covered by NSO stipulations. NSO stipulations are nearly as restrictive to geothermal energy development as an area being closed to leasing. Any geothermal projects proposed in areas of CSU and TL stipulations would have added cost and scheduling challenges.

Table 4.24 compares the acres of categories of geothermal potential within the decision area by whether they would be open or closed to leasing and what stipulations would be applied.

Table 4.24
Geothermal Leasing Categories, Alternative A

Geothermal Potential	Closed to Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
High Potential	0	0	0	9,700
Moderate Potential	500	1,720	50,500	103,400
Low/No Known Potential	0	0	260	8,980
Total	**500**	**1,720**	**50,760**	**122,080**

Source: BLM 2012d

Under Alternative A, 500 acres of federal mineral estate would remain closed to geothermal leasing. None of these closed acres is considered to have high geothermal potential; all of the acres of high geothermal potential would continue to be open without restrictions or stipulations. However, there is still very little reasonably foreseeable development within the planning area. This is due to overall unsuitably for geothermal development within the planning area when compared to nearby areas.

Existing leases within occupied habitat would continue to be developed according to their lease terms, which may include disturbance buffers and TL stipulations in GRSG habitat. COAs could

be applied to mitigate or prevent impacts on public lands or other resources. BMPs could be incorporated as a COA.

Continuing to apply disturbance buffers and seasonal TL stipulations on surface-disturbing and disruptive activities in portions of GRSG breeding, nesting, and winter habitat would directly impact development of geothermal resources by limiting the siting, design, and operations of geothermal development projects. This, in turn, could force operators to use more costly development methods (such as horizontal drilling) than they otherwise might have used. Equipment shortages could result from application of TL stipulations because a bottleneck could be created during the time period in which activity would be allowed.

Geothermal exploration would continue to be allowed in the decision area wherever acres are open to geothermal leasing. However, geothermal exploration in GRSG habitat would continue to be subject to any applicable disturbance buffers or TL stipulations described above.

The geothermal RFD scenario area within the Bald Hills Population Area is already leased. The lease was issued with stipulations in place, and no more stipulations can be added to the lease. Geothermal development within the population area would be subject to COAs placed upon the project at the time of subsequent NEPA analysis and would be subject to any restrictions resulting from ESA Section 7 Consultation with USFWS regarding any listed species in the project area.

4.20.3 Alternative B

Lands and Realty

Managing a total of 2,784,200 acres as ROW exclusion and 532,100 acres as ROW avoidance within mapped occupied GRSG habitat under Alternative B would decrease the BLM's and Forest Service's ability to accommodate wind energy development demand in GRSG habitat areas. However, of the total areas statewide considered developable (i.e., wind speeds greater than 7 meters per second), 19 percent are located within mapped GRSG occupied habitat. Specifically, 12,600 acres considered as having good or better wind potential would be managed as ROW exclusion areas and would not be open for ROW applications (**Table 4.23**). This represents 12,600 fewer acres open to wind energy development than under Alternative A and a reduction of 7 percent in developable windy lands across Utah as compared with Alternative A.

Under Alternative B, an additional 22,900 acres considered as having good or better wind potential would be managed as ROW avoidance areas. This represents 22,900 fewer acres available for wind development without substantial restrictions than Alternative A and an increased restriction on 12 percent of all developable windy lands across Utah as compared with Alternative A.

In total, 74 percent of the 48,100 acres of lands with good or better wind potential within the decision area would be unavailable or restricted under Alternative B: 26 percent would be completely unavailable for wind development due to ROW exclusion management, and another 48 percent would be substantially restricted due to ROW avoidance management.

7,880 acres (52 percent) of the 15,100 acres of BLM-administered lands identified in the wind RFD in Hamlin Valley and Bald Hills Population Areas that are open to ROW applications under Alternative A would become ROW exclusion areas under Alternative B. These ROW exclusion areas would be the result of these areas being designated as PHMA under Alternative B. The potential for development to occur as anticipated in the RFD would be reduced by approximately half with implementation of Alternative B.

Limitations on new ROWs, such as transmission lines and pipelines, throughout PHMA and GHMA could also restrict opportunities to develop renewable energy resources, particularly where exclusion and avoidance areas abut public and private lands with developable renewable energy resource potential. Where excluded or infeasible (technically and/or financially because of avoidance criteria), renewable energy and transmission line developments would be diverted to adjacent nonfederal lands or prevented altogether. The result would be reduced opportunity to meet demand for renewable energy.

Collocating utilities within designated corridors would reduce land use conflicts by grouping similar facilities and activities in specific areas and away from conflicting developments and activities. It would also clarify the preferred locations for utilities, would make construction and maintenance of the facilities easier, and would simplify the application processing for new facilities. However, designation of corridors could limit options for ROW and facility design and selection of more-preferable locations.

Mineral Development (including geothermal)

Table 4.25 compares the acres of categories of geothermal potential within the decision area by whether they would be open or closed to leasing and what stipulations would be applied.

Table 4.25
Geothermal Leasing Categories, Alternative B

Geothermal Potential	Closed to Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
High Potential	8,050	0	0	1,670
Moderate Potential	118,500	610	27,700	16,400
Low/No Known Potential	9,620	0	260	0
Total	**136,170**	**610**	**27,960**	**18,070**

Source: BLM 2012d

Under Alternative B, 136,170 acres would be closed to geothermal leasing, including 8,050 acres of high potential and 118,500 acres of moderate potential lands. Alternative B would close to leasing 83 percent of all high potential geothermal lands and 77 percent of all moderate potential lands within the decision area that are open under Alternative A.

These closures would directly impact the fluid minerals program by prohibiting the development of geothermal energy on portions of federal mineral estate. Geothermal operations would be

limited in their choice of project locations and could be forced to develop in areas that are challenging to access or have fewer economic resources because more-ideal areas could be closed to leasing. This could raise the cost of geothermal development in the planning area and could result in operators moving to nearby nonfederal minerals that are open to leasing.

Continuing to apply disturbance buffers and seasonal TL stipulations on surface-disturbing and disruptive activities in portions of GRSG breeding, nesting, and winter habitat would have the same impacts as described under Alternative A.

Under Alternative B, conservation measures in addition to RDFs would be applied as COAs to existing leases within PHMA overlying federal mineral estate. These RDFs and conservation measures would include requirements such as surface-disturbance limitations, TL stipulations, noise restrictions, structure height limitations, design requirements, water development standards, remote monitoring requirements, and reclamation standards. Application of these requirements through COAs would impact geothermal operations by increasing costs if they resulted in the application of additional requirements and/or use of more expensive technology (such as remote monitoring systems) than would otherwise have been used by operators. To avoid these costs, operators could move to nearby nonfederal minerals, though these options are limited.

The geothermal RFD scenario area within the Bald Hills Population Area is already leased. The lease was issued with stipulations in place, and no more stipulations could be added to the lease. The geothermal RFD scenario area is within mapped occupied habitat but not within PHMA; as such, the estimated 35 acres of habitat that may be disturbed would not be subject to RDFs. The potential for the development of geothermal resources within the geothermal RFD scenario area under Alternative B is the same as under Alternative A.

4.20.4 Alternative C

Lands and Realty

Under Alternative C, 35,500 acres considered as having good or better wind potential would be managed as ROW exclusion areas and would not be open for ROW applications (**Table 4.23**). This represents 35,500 fewer acres open to wind energy development than under Alternative A and a reduction of 19 percent in developable windy lands across Utah as compared with Alternative A. In total, 74 percent of the 48,100 acres of lands with good or better wind potential within the decision area would be unavailable under Alternative C.

Excluding ROW development in all mapped occupied GRSG habitat (3,313,800 acres) would prevent the development of transmission lines in these areas and further restrict wind energy development opportunities on public lands outside GRSG habitat. Alternative C would also limit renewable energy development opportunities on adjacent nonfederal land where transmission infrastructure would be needed across BLM-administered or National Forest System lands.

Mineral Development (including geothermal)

Table 4.26 compares the acres of categories of geothermal potential within the decision area by whether they would be open or closed to leasing and what stipulations would be applied.

Table 4.26
Geothermal Leasing Categories, Alternative C

Geothermal Potential	Closed to Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
High Potential	9,700	0	0	0
Moderate Potential	166,800	0	0	0
Low/No Known Potential	10,200	0	0	0
Total	**186,700**	**0**	**0**	**0**

Source: BLM 2012d

Under Alternative C, 186,700 acres would be closed to geothermal leasing, including 9,700 acres of high potential and 166,800 acres of moderate potential lands. Alternative C would close to leasing 100 percent of all high and moderate potential geothermal lands within the decision area that are open under Alternative A.

Management applicable to existing leases under Alternative C would be similar to those under Alternative B. In addition to applying the restrictive management under Alternative B to more acres, Alternative C would also call for COAs implementing seasonal restrictions on vehicle traffic and human presence associated with exploratory drilling. This alternative also would limit new surface disturbance on existing leases to 3 percent per section, with some exceptions. Impacts of these operating and siting restrictions would be the same type as those described under Alternative B.

Under Alternative C, geothermal exploration would be prohibited on 4,008,580 acres of federal mineral estate within mapped occupied habitat. Closing occupied habitat to geothermal exploration could reduce the availability of data on geothermal resources outside occupied habitat and could increase costs of geothermal development if it resulted in the use of more expensive technology to acquire such data by other means.

Impacts on the geothermal RFD scenario area from fluid minerals management would be the same as described under Alternative B.

4.20.5 Alternative D

Lands and Realty

Under Alternative D, 2,864,300 acres in the planning area would be managed as ROW exclusion and 471,900 acres as avoidance for utility-scale wind energy. Impacts on wind energy ROWs under Alternative D would be similar to Alternative C, with the exception that additional exclusion and avoidance criteria would apply to areas outside mapped occupied habitat. Of those areas considered as having good or better wind potential, 12,600 acres (plus any lands within 1 mile of occupied leks) would be managed as ROW exclusion areas and would not be open for ROW applications (**Table 4.23**). Like Alternative B, this represents 12,600 fewer acres open to wind energy development than under Alternative A and a reduction of 7 percent

in developable windy lands across Utah as compared with Alternative A. Under Alternative D, any areas outside PHMA and within 4 miles of an occupied lek would be managed as ROW avoidance areas. This represents fewer acres available for wind development without substantial restrictions than Alternative A. In total, at least 26 percent of the 48,100 acres of lands with good or better wind potential within the decision area would be unavailable or substantially restricted due to ROW exclusion and avoidance management under Alternative D.

8,250 acres (55 percent) of the 15,100 acres of BLM-administered lands identified in the wind RFD in Hamlin Valley and Bald Hills Population Areas that are open to ROW applications under Alternative A would become ROW exclusion areas under Alternative D. An additional 2,380 acres (16 percent) of the 15,100 acres would become ROW avoidance area. The potential for development to occur as anticipated in the RFD would be reduced by more than half with implementation of Alternative D.

Alternative D would also exclude aboveground transmission lines in PHMA (1,422,300 acres) and avoid aboveground transmission lines on an additional 1,368,900 acres of occupied GRSG habitat. Impacts on renewable energy from restrictions on transmission line infrastructure development, including from requirements to collocate utilities within designated corridors within avoidance areas, would be the same as those described in Alternative B.

Mineral Development (including geothermal)

Table 4.27 compares the acres of categories of geothermal potential within the decision area by whether they would be open or closed to leasing and what stipulations would be applied.

Table 4.27
Geothermal Leasing Categories, Alternative D

Geothermal Potential	Closed to Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
High Potential	0	0	9,720	0
Moderate Potential	460	31,400	135,000	0
Low/No Known Potential	0	3,620	6,600	0
Total	**460**	**35,020**	**151,320**	**0**

Source: BLM 2012d

Under Alternative D, CSU and TL stipulations would be applied to the entire 9,720 acres of high potential lands that were open with only standard stipulations under Alternative A. Moderate potential lands would also be more restricted under Alternative D, with an additional 31,400 acres moving from open with standard stipulations under Alternative A into open with NSO stipulations. An additional 135,000 acres of moderate potential lands would change from open with only standard stipulations under Alternative A to open with CSU and TL stipulations under Alternative D.

The CSU stipulations would include noise and tall structure limitations and, at times, a site-specific plan of development to limit habitat fragmentation and a 5 percent disturbance limit.

Application of these surface-disturbance restrictions, TL stipulations, and other operating standards would limit the siting, design, and operations of geothermal development projects in the manner described under Alternative A. However, these impacts would be mitigated in GHMA where off-site mitigation would allow operators to waive the applicable stipulations.

For existing leases, the BLM and Forest Service would apply the same RDFs to the same acreage as under Alternative B. However, exceptions to application of RDFs could mitigate impacts. Exceptions would occur where a design feature was not applicable (e.g., a resource is not present on a given site) or where the design feature would not actually provide additional protection for GRSG or its habitat. See **Table 2.4** for more information on when these exceptions to RDFs would apply.

The conservation measures applied under Alternative D would also differ from Alternative B. A 5 percent disturbance limit would apply instead of a 3 percent limit, and surface occupancy buffers and TL stipulations would not apply to surface disturbance; rather, surface disturbance would minimize habitat loss, fragmentation, and direct and indirect effects on GRSG and its habitat. The impacts of applying these RDFs and conservation measures would be the same type as those described under Alternative B. On- or off-site mitigation would be used to minimize impacts on GRSG. Where operators use such mitigation to protect GRSG, geothermal development costs would increase as compared with Alternative A due to the additional expense of mitigation activities.

Geothermal exploration would be allowed in occupied habitat, but seasonal restrictions would apply in nesting, brood-rearing, and winter habitat. While these restrictions would continue to apply to exploration in some areas under Alternative A, more consistent application under Alternative D would increase impacts on geothermal development. These impacts would be the same type as those described under Alternative B.

Impacts on the geothermal RFD scenario area from fluid minerals management would be the same as described under Alternative B.

4.20.6 Alternative E

Lands and Realty

Under Alternative E, impacts of ROW exclusion area management would be the same as described under Alternative A, as no areas considered as having good or better wind potential would be managed as ROW exclusion. In addition, 12,600 acres considered as having good or better wind potential would be managed as ROW avoidance areas (**Table 4.23**). This represents 12,600 fewer acres available for wind development without substantial restrictions than Alternative A and an increased restriction on 7 percent of all developable windy lands across Utah as compared with Alternative A. In total within the decision area, 27 percent of the 48,100 acres of lands with good or better wind potential would have restrictions for wind development through ROW avoidance management.

7,880 acres (52 percent) of the 15,100 acres of BLM-administered lands identified in the wind RFD in Hamlin Valley and Bald Hills Population Areas that are open to ROW applications under Alternative A would become ROW avoidance areas under Alternative E. These ROW

avoidance areas would place restrictions on potential development in these areas but would not prevent development from occurring. The potential for development to occur as anticipated in the RFD would be reduced due to physical and financial obstacles.

Impacts of collocating utilities within designated corridors would be the same as those described under Alternative B.

Mineral Development (including geothermal)

Table 4.28 compares the acres of categories of geothermal potential within the decision area by whether they would be open or closed to leasing and what stipulations would be applied.

Table 4.28
Geothermal Leasing Categories, Alternative E

Geothermal Potential	Closed to Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
High Potential	0	0	8,000	1,700
Moderate Potential	500	4,700	141,600	15,600
Low/No Known Potential	0	0	16,800	800
Total	**500**	**4,700**	**166,700**	**18,000**

Source: BLM 2012d

Under Alternative E, no additional acres of high or moderate acres would be closed to geothermal leasing as compared with Alternative A. NSO stipulations would be added to 3,000 acres of moderate potential lands under Alternative E. Alternative E would change an additional 8,000 acres of high potential lands and an additional 91,100 acres of moderate potential lands from being open only with standard stipulations to being open subject to CSU and TL stipulations. Restriction of these acres would directly impact the potential for geothermal development in the manner described under Alternative A. Existing leases would remain valid through their term, but NSO/TL stipulations would be applied if the lease were renewed.

CSU and TL stipulations would also apply to geothermal exploration within mapped GRSG habitat in SGMAs/core areas. Impacts of these restrictions on geothermal exploration would be the same type as those described under Alternative A.

Under Alternative E, no management actions from this LUPA would apply to the federal mineral estate outside of mapped GRSG habitat in SGMAs/core areas in the decision area. Management of these areas and impacts of that management would be the same as described under Alternative A.

The geothermal RFD scenario area within the Bald Hills Population Area is already leased. The lease was issued with stipulations in place, and no more stipulations can be added to the lease.

The potential for the development of geothermal resources within the geothermal RFD scenario area is the same under Alternative E as under Alternative A.

4.20.7 Proposed Plans

Lands and Realty

Under the Proposed Plans, the BLM and Forest Service would manage 2,797,100 acres of mapped GRSG habitat as ROW exclusion and 565,200 acres as avoidance or open for utility-scale wind energy. Impacts on wind energy ROWs under the Proposed Plans would be similar to Alternative D, with the exception that RDFs, buffers requirements, and mitigation standards would apply to any development in areas that are not excluded. More than a quarter of the developable wind resources in the decision area would be unavailable or substantially restricted due to ROW exclusions.

Outside of exclusion areas, the requirement, under the Proposed Plans, for all discretionary projects to achieve net conservation gain in GRSG habitat, would have direct short- and long-term effects on wind energy development where projects could not meet those standards through design, placement, and/or mitigation. The Proposed Plans would also indirectly affect wind energy development through restrictions on transmission line ROWs. The combined effects would be a redirection of wind energy development to "good" wind resource areas outside GRSG habitat.

Mineral Development (including geothermal)

Table 4.29 compares the acres of categories of geothermal potential within the decision area by whether they would be open or closed to leasing and what stipulations would be applied.

Table 4.29
Geothermal Leasing Categories, Proposed Plans

Geothermal Potential	Closed to Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
High Potential	0	8,100	0	1,700
Moderate Potential	455	114,200	31,900	15,600
Low/No Known Potential	0	18,000	300	0
Total	**455**	**140,200**	**32,100**	**17,300**

Source: BLM 2015

Under the Proposed Plans, 8,100 acres (83 percent) of the high potential geothermal areas in the decision area would be managed as NSO with stipulations. Moderate potential lands would also be more restricted under the Proposed Plans compared to Alternative A, with an additional 112,500 acres moving from open with standard stipulations under Alternative A into open with NSO stipulations. Compared to Alternative A, 45 less acres with known geothermal potential would be closed to leasing. Short- and long-term direct and indirect impacts on geothermal development because of NSO stipulations would include reduced leasing and subsequent development opportunities in GRSG habitat. Future leasing and development would be more likely to occur in known resource areas outside GRSG habitat.

CSU stipulations and TLs under the Proposed Plans, which would apply to 31,900 acres of moderate potential areas, would include noise and tall structure limitations, RDFs, and a 3 percent disturbance limit. Application of these surface-disturbance restrictions, TL stipulations, and other operating standards would limit the siting, design, and operations of geothermal development projects in the manner described under Alternative A. However, these impacts could be mitigated in GHMA where design, siting, and mitigation could demonstrate net conservation gain for GRSG and its habitat.

For existing leases, the BLM and Forest Service would apply RDFs, except where the design feature would not actually provide additional protection for GRSG or its habitat. See **Section 2.6**, Proposed Plan Amendments, for more information on when these exceptions to RDFs would apply. The impacts of applying these RDFs and conservation measures would be the same type as those described under Alternative D. On- or off-site mitigation would be used to minimize impacts on GRSG. Where operators use such mitigation to protect GRSG, geothermal development costs would increase as compared with Alternative A due to the additional expense of mitigation activities.

Impacts on geothermal exploration and the geothermal RFD scenario area from fluid minerals management would be the same as those described under Alternative B.

4.21 MINERALS

4.21.1 Oil and Gas

Methods and Assumptions

Analysis of impacts on oil and gas from this LUPA focuses on the impacts of conservation measures to protect GRSG. These impacts may be direct or indirect. For example, a direct impact on fluid minerals would result from closing an area to oil and gas leasing. An indirect impact would result from managing an area as ROW exclusion, which would change the economic feasibility of developing a lease. Additional actions or conditions that could cause direct or indirect impacts on oil and gas are described under *Indicators*, below.

While geothermal energy is considered a fluid leasable, it is discussed in **Section 4.20**, Renewable Energy. Similarly, indirect impacts on oil shale and tar sands are discussed in **Section 4.21.6**, Oil Shale and Tar Sands.

Indicators

Indicators of impacts on oil and gas are as follows:

- The amount of land identified as closed to new leasing
- The amount of land subject to NSO stipulations
- The amount of land subject to CSU and/or TL stipulations
- Application of COAs for the protection of GRSG on existing leases
- Restrictions on exploration in GRSG habitat
- The amount of land managed as ROW avoidance areas

- The amount of land managed as ROW exclusion areas
- The amount of land closed to mineral material disposal

Where information is available, consideration is given to the potential for fluid mineral resources on lands closed to new leasing. For example, an indicator of an impact on fluid minerals is if there were substantial reductions in federal leasing and development of fluid mineral resources in high potential areas.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Fluid mineral operations on existing federal leases, regardless of surface ownership, would be subject to COAs by the BLM Authorized Officer and the authorized officer of the surface management agency at the time of APD approval. The BLM and Forest Service can deny surface occupancy on portions of leases with COAs to avoid or minimize resource conflicts if this action does not eliminate reasonable opportunities to develop the lease. Existing leases would be developed consistent with applicable laws and valid existing rights, using as many of the RDFs and conservation measures as possible while still allowing reasonable opportunities for development. Access to producing leases, including roads and pipelines to those leases, would not be affected by this LUPA.
- Because ROWs are not required for construction of roads and facilities within a lease or between leases within a unit, these areas would not be impacted by ROW exclusion or avoidance areas proposed under any alternative. Road and facility construction to access existing leases from outside the lease may be impacted by restrictions described under individual alternatives.
- Valid existing leases would be managed under the stipulations in effect when the leases were issued; new stipulations proposed under this LUPA would apply only on new leases. See the glossary for definitions of stipulations versus COAs.
- Under all alternatives, reclamation bonds would be required, pursuant to 43 CFR 3104, in an amount sufficient to ensure full restoration of lands to the condition in which they were found. In addition, APDs, including drilling plans and surface use plans of operations, would be required under all alternatives in accordance with 43 CFR 3162.
- If an area is leased, it could be developed; however, not all leases would be developed within the life of this LUPA.
- As the demand for energy increases, so will the demand for extracting energy resources in areas with potential.
- Technological advancements, such as directional drilling, could lead to changes in levels of fluid mineral development potential throughout the planning area as additional resources become more easily accessible.
- Stipulations apply to fluid mineral leasing on all surface lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered

and National Forest System surface and non-BLM-administered and non-National Forest System surface. There are 4,008,600 acres of federal mineral estate within the decision area (3,313,800 acres of BLM-administered and National Forest System surface with federal minerals, and 694,800 acres of non-BLM-administered and non-National Forest System surface with federal minerals).

- As discussed in the Minerals section of **Chapter 3**, it is projected that 2,416 new federal wells will be developed on federal mineral estate in mapped occupied GRSG habitat in the next 15 years. Approximately 99 percent of these wells are projected to be within the Uintah, Carbon, Emery, and Rich Population Areas. The Carbon and Uintah population areas are expected to see particularly high levels of development in some areas, while less development is expected in the Emery and Rich Population Areas.

Implementing management for the following resources to protect GRSG would have negligible or no impact on fluid minerals and is therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, and ACECs.

Alternative A

Special Status Species – GRSG
Under Alternative A, no disturbance cap would be applied to anthropogenic disturbance in GRSG habitat. Therefore, fluid mineral development could continue to occur subject to stipulations and other restrictions applied specifically to fluid mineral activities.

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact fluid minerals. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative A, 3,219,000 acres (97 percent) of BLM-administered and National Forest System surface within the decision area would continue to be open to ROW location. However, wherever there is overlap between federal oil and gas leases and the 94,800 acres (3 percent) of BLM-administered and National Forest System surface in the decision area that would continue to be managed as ROW avoidance or exclusion under this alternative, the fluid minerals program could be indirectly impacted by the resulting limits on the available means for transporting fluid minerals to processing facilities and markets. Impacts would be mitigated where new ROWs could be collocated within existing ROWs to satisfy valid existing rights. Additionally, leases within units would not be impacted as much because infrastructure within these unitized leases is exempt from ROW requirements.

Mineral Development (including geothermal)
Management actions for mineral programs other than mineral materials and fluid minerals would not impact fluid minerals. Therefore, only the impacts from mineral materials and fluid mineral management actions are discussed in the paragraphs below.

Mineral Materials

Approximately 3,932,200 acres (98 percent) of federal mineral estate within the decision area would remain open to mineral material disposal under Alternative A, including 1,273,500 acres (98 percent) of federal mineral estate with mineral material occurrence in the decision area. Approximately 73,500 acres (2 percent) of federal mineral estate within the decision area would remain closed to mineral material disposal. This would include 21,800 acres (2 percent) of federal mineral estate with mineral material occurrence in the decision area. Closing these areas to mineral material disposal could indirectly impact fluid minerals in the areas by reducing the amount of readily available material for road and pipeline construction. This could limit the available means for accessing fluid mineral resources and transporting those resources to processing facilities and markets and could ultimately decrease the amount of development of federal fluid minerals in the planning area.

Fluid Minerals

Utah Sub-region (Total Decision Area). **Table 4.30** breaks down the acres within the decision area by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. This breakdown is done by oil and gas occurrence potential (high, moderate, and low or no known potential).

Under Alternative A, 31,600 acres with high development potential (5 percent of the federal mineral estate with high development potential) would remain closed to new oil and gas leasing. Acres closed in this category would have the greatest impact on the fluid minerals program by prohibiting oil and gas development on portions of federal mineral estate with high potential for such development. An additional 42,200 acres with moderate development potential and 64,700 acres with low or no known development potential would also remain closed to new oil and gas leasing. In areas closed to new leasing (totaling 138,500 acres of federal mineral estate for this alternative), oil and gas operations would be restricted in their choice of project locations and may be forced to develop in areas that are challenging to access or have less economic resources because more ideal areas could be closed to new leasing. This could raise the cost of fluid mineral development in the planning area. In some cases, where resources, geology, and topography allow for access to unleased resources, these closures could result in operators moving to nearby private or state minerals that are open to leasing and thereby draining the unleased federal mineral estate. When such movement occurred, the federal treasury would receive less in royalties

Approximately 15,400 acres of federal mineral estate with high development potential (2 percent of the federal mineral estate with high potential) would remain open to leasing subject to NSO stipulations. Acres subject to NSO stipulations in areas with high development potential for oil and gas would have a greater impact on the fluid minerals program in comparison to acres subject to NSO stipulations in areas with moderate (82,000 acres) or low (386,000 acres) development potential because the likelihood of developing acres in areas with high development potential is greater. In areas where NSO stipulations are applied (totaling 483,400 acres of federal mineral estate for this alternative), federal fluid minerals could be leased, but the leaseholder/operator would have to use offsite methods such as directional or horizontal drilling

Table 4.30
Oil and Gas Leasing Categories in the Decision Area, Alternative A[1]

Oil and Gas Development Potential	Closed to New Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
Total Decision Area				
High	31,600	15,400	446,400	134,500
Moderate	42,200	82,000	105,200	532,500
Low/No Known	64,700	386,000	726,400	661,900
Total	**138,500**	**483,400**	**1,278,000**	**1,328,900**
Uintah Population Area				
High	14,000	7,000	236,500	113,300
Moderate	1,300	500	12,400	1,000
Low/No Known	53,500	6,500	117,100	34,000
Total	**68,800**	**14,000**	**366,000**	**148,200**
Carbon Population Area				
High	35,100	34,400	88,500	64,400
Moderate	27,600	75,000	78,900	77,100
Low/No Known	0	31,100	23,700	13,100
Total	**62,700**	**140,500**	**191,000**	**154,700**
Emery Population Area				
High	0	7,900	30	19,200
Moderate	0	40,700	13,500	51,800
Low/No Known	100	67,300	57,200	54,800
Total	**100**	**115,800**	**70,700**	**125,800**
Rich Population Area				
High	0	0	165,700	0
Moderate	0	200	4,700	0
Low/No Known	0	0	3,300	0
Total	**0**	**200**	**173,700**	**0**

Source: BLM 2012d
[1]Does not include 800,300 acres in the decision area for which the planning decision is not mapped. These areas may be in various leasing categories, but the acreage in each category is unknown.

to access mineral resources that have high potential for oil and gas development. The area where directional and horizontal drilling can be effectively used is limited, meaning some minerals may be inaccessible in areas where an NSO stipulation covers a large area or where no leasing is allowed on surrounding lands. Currently, 2 percent of federal wells in the planning area are drilled horizontally, and 55 percent are drilled directionally. The low percentage of existing horizontal wells in the planning area demonstrates the economical, technological, and geological limitations of horizontal drilling as a way to extract oil and gas resources in Utah. For example, horizontal drilling is feasible only when developing a horizontal play such as the Paradox member in Cane Creek field north of Moab.

Of the federal mineral estate in the decision area, approximately 446,400 acres with high, 105,200 acres with moderate, and 726,400 acres with low development potential would remain

open subject to CSU or TL stipulations, totaling 1,278,000 acres for this alternative. Applying CSU and TL stipulations on surface-disturbing and disruptive activities in portions of GRSG breeding, nesting, and winter habitat would directly impact development of oil and gas resources by limiting the siting, design, and operations of oil and gas development projects. This, in turn, could force operators to use more costly development methods (such as directional or horizontal drilling or delaying operations) than they otherwise might have used. Equipment shortages could result from application of TL stipulations because a bottleneck could be created during the time period in which activity would be allowed.

The remaining 134,500 acres of federal mineral estate in high, 532,500 in moderate, and 661,900 in low development potential areas (totaling 1,328,900 acres of federal mineral estate) would be available for fluid mineral leasing and development with standard lease stipulations; these lands would not be subject to additional NSO or CSU stipulations, providing the most flexibility for oil and gas exploration and development.

A total of 187,000 acres within the decision area have no fluid minerals planning decision. If the BLM or Forest Service received an expression of interest in leasing within these areas, additional leasing-specific NEPA analysis would need to be completed before this leasing could occur.

Under this alternative, it is projected that 2,416 new oil and gas wells would be drilled on federal mineral estate on new and existing leases in the population areas in the next 15 years. This rate of development would allow oil and gas production to continue at or near current production rates.

There are 895,200 acres of existing leases in the decision area, of which 205,900 are held by production (an additional 7,200 acres of leases are pending). These existing leases could continue to be developed according to their lease terms, which may include disturbance buffers and TL stipulations in GRSG habitat. COAs could be applied, consistent with the rights granted in the lease, to mitigate or prevent impacts on public lands or other resources. BMPs could be incorporated as COAs. Where stipulations and disturbance buffers apply to existing leases, the cost of developing those leases increases. Facilities may not be able to be sited in their ideal locations for developing the resource, and project delays could occur during seasons when development is prohibited. Costs could also increase when COAs are applied to these leases due to the need to use more expensive technology to satisfy the requirements of the BMPs.

Exploration would continue to be allowed in the decision area wherever acres were open to fluid mineral leasing. However, exploration in GRSG habitat would continue to be subject to any applicable disturbance buffers or TL stipulations described above.

Uintah Population Area. **Table 4.30** breaks down the acres within the population areas by whether they would remain open or closed to new leasing and what stipulations would be applied to new leases. A total of 68,800 acres (11 percent of federal mineral estate within the population area) would remain closed to new leasing under this alternative. Most of these acres (53,500 acres, or 78 percent of federal mineral estate closed to new leasing in this population area) have low or no known oil and gas development potential, minimizing impacts on the fluid minerals program. As described above under *Utah Sub-region (Total Decision Area),* the greatest impact on the fluid minerals program would result from areas closed to new leasing that have

high oil and gas development potential (14,000 acres, or 20 percent of federal mineral estate with high development potential in this population area). In these areas, the development of oil and gas would continue to be prohibited on portions of federal mineral estate with high development potential for oil and gas.

The majority of the Uintah Population Area would remain open to leasing subject to CSU/TL stipulations (366,000 acres, or 61 percent of federal mineral estate within the population area) or open to leasing subject to standard terms and conditions (148,200 acres, or 25 percent), both of which provide flexibility for development within the population area. Under this alternative, it is projected that 1,370 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Uintah Population Area in the next 15 years, allowing the Uintah Population Area to continue as a primary location of oil and gas development in Utah as described in the Minerals section of **Chapter 3**.

Carbon Population Area. **Table 4.30** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. A total of 62,700 acres (11 percent of federal mineral estate within the population area) would remain closed to new leasing under this alternative. Most of these acres (35,100 acres, or 56 percent of federal mineral estate closed to new leasing in this population area) have high oil and gas development potential. As described above under *Utah Sub-region (Total Decision Area),* closure of these areas would continue to have the greatest impact on the fluid minerals program by prohibiting the development of oil and gas on portions of federal mineral estate with high development potential for oil and gas.

The majority of the Carbon Population Area would remain open to leasing subject to CSU/TL stipulations (191,000 acres, or 35 percent of federal mineral estate within the population area) or open to leasing subject to standard terms and conditions (154,700 acres, or 28 percent), both of which provide flexibility for development within the population area. Under this alternative, it is projected that 960 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Carbon Population Area to continue as a primary location of oil and gas development in Utah as described in the Minerals section of **Chapter 3**.

Emery Population Area. **Table 4.30** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. Under Alternative A, the majority of the Emery Population Area would remain open to leasing subject to standard terms and conditions (125,800 acres, or 40 percent of federal mineral estate within the population area), providing the most flexibility for development within the population area.

A total of 100 acres (less than 1 percent of federal mineral estate within the population area) would remain closed to new leasing under this alternative, all of which is within areas with low or no known development potential for oil and gas. Impacts on the fluid minerals program from these closures would be the same type as those described for Alternative A, *Utah Sub-region (Total Decision Area)*; however, because so little of the population area would be closed to new leasing and there is little projected future development in the population area, these impacts would be minimal. Under this alternative, it is projected that 40 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Emery Population Area in the

next 15 years. This low projection is because, as described in the Minerals section of **Chapter 3**, challenging topography and access issues have limited the development potential of the resources contained in the population area.

Rich Population Area. **Table 4.30** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. Under Alternative A, nearly the entire Rich population area would remain open to leasing subject to CSU/TL stipulations (173,700 acres, or 99.9 percent of federal mineral estate within the population area), minimizing impacts on oil and gas development within the population area. Under this alternative, it is projected that 13 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Rich Population Area in the next 15 years. This low projection is because, as described in the Minerals section of **Chapter 3**, much of the oil and gas resources in the population area have already been developed and little future development is expected in the population area.

Alternative B

Special Status Species – GRSG

Under Alternative B, a disturbance cap of 3 percent of PHMA within a population area would be applied to all anthropogenic disturbances, including fluid mineral development. In PHMA where the 3 percent cap is already exceeded, no new fluid mineral leases would be issued until habitat within the PHMA was restored to a point that acreage of anthropogenic disturbance was below the 3 percent cap. While no population area contains anthropogenic disturbance of more than 3 percent of PHMA, PHMA in sub-areas within the Uintah and Carbon Population Areas would exceed the 3 percent cap. However, because all federal mineral estate in PHMA would be closed to new fluid mineral leasing, new fluid mineral leases would not be impacted by the disturbance cap. Valid existing lease rights would be honored, but mitigation measures may be required for development in the sub-areas that exceed the 3 percent disturbance cap.

Infrastructure Development (including all ROWs and utility corridors)

Management actions for programs related to infrastructure development other than lands and realty would not impact fluid minerals. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative B, all BLM-administered and National Forest System surface in PHMA (totaling 2,784,200 acres, or approximately 84 percent of BLM-administered and National Forest System surface in the decision area) would be managed as ROW exclusion areas. However, because all PHMA would be closed to new fluid mineral leasing under Alternative B, managing areas as ROW exclusion in PHMA would only impact existing fluid mineral leases. Managing areas as ROW exclusion could restrict construction of new roads or pipelines to access existing leases in those areas.

All BLM-administered and National Forest System surface in GHMA (totaling 532,100 acres, or 16 percent of BLM-administered and National Forest System surface in the decision area) would be managed as ROW avoidance under Alternative B. Fluid minerals beneath those 532,100 acres of BLM-administered and National Forest System surface in GHMA would be impacted by the ROW avoidance area, as described under Alternative A.

Mineral Development

Management actions for mineral programs other than mineral materials and fluid minerals would not impact fluid minerals. Therefore, only the impacts from mineral materials and fluid mineral management actions are discussed in the paragraphs below.

Mineral Materials

Under Alternative B, approximately 3,340,000 acres of federal mineral estate in PHMA (83 percent of the federal mineral estate decision area) would be closed to mineral material disposal. This includes 1,140,000 acres with mineral material occurrence (87 percent of federal mineral estate with mineral material occurrence in the decision area). However, because all PHMA would be closed to fluid mineral leasing under this alternative, closing PHMA to mineral material disposal would only impact existing fluid mineral leases. Closing areas to mineral material disposal could prevent construction of new roads due to a lack of available road material and could therefore decrease overall development of federal fluid minerals in the planning area. However, operators could purchase gravel from elsewhere and transport it where needed.

Fluid Minerals

Utah Sub-region (Total Decision Area). Under Alternative B, all federal mineral estate within PHMA (3,328,800 acres, or 83 percent of the federal mineral estate decision area) would be closed to new oil and gas leasing. These closures would include 407,100 acres with high oil and gas potential (32 percent of the high potential acres in the decision area). Closure of these acres would directly impact the fluid minerals program in the manner described under Alternative A. Existing leases would remain valid through their term, or as long as they are held by production; they could not be renewed. Existing leases that are isolated and exploratory in nature may not be developed if operators are unable to lease additional areas surrounding those leases. Operators may not consider development of the existing lease to be cost-effective if the surrounding area is closed to leasing and total production from the area would be limited. Impacts on isolated leases would be limited because of the small number of leases in this situation in the planning area. **Table 4.31** breaks down the acres within the decision area by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. This breakdown is done by oil and gas occurrence potential (high, moderate, and low or no known potential).

The 679,800 acres of federal mineral estate within GHMA (17 percent of the decision area) would be subject to the same stipulations and management as under Alternative A.

A total of 43,400 acres within the decision area would have no fluid minerals planning decision. If the BLM or Forest Service received an expression of interest in leasing within these areas, additional leasing-specific NEPA analysis would need to be completed before this leasing could occur.

Under Alternative B, it is projected that 2,137 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the population areas in the next 15 years. This represents a 12-percent decrease in projected wells on federal mineral estate compared with Alternative A.

Table 4.31
Oil and Gas Leasing Categories in the Decision Area, Alternative B[1]

Oil and Gas Potential	Closed to New Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
Total Decision Area				
High	407,100	7,000	209,400	113,400
Moderate	766,300	9,900	29,300	47,600
Low/No Known	2,142,200	7,500	17,600	81,800
Total	**3,315,500**	**24,400**	**256,400**	**242,800**
Uintah Population Area				
High	84,800	5,800	194,700	95,400
Moderate	6,500	400	11,700	300
Low/No Known	333,200	0	3,700	3,800
Total	**424,600**	**6,200**	**210,200**	**99,500**
Carbon Population Area				
High	75,500	700	12,100	15,900
Moderate	124,800	900	6,100	6,600
Low/No Known	44,600	300	2,300	1,900
Total	**244,900**	**1,900**	**20,500**	**24,400**
Emery Population Area				
High	3,100	400	20	1,500
Moderate	29,800	900	10	2,500
Low/No Known	51,200	100	130	3,200
Total	**84,100**	**1,400**	**160**	**7,300**
Rich Population Area				
High	227,200	0	0	0
Moderate	8,700	200	200	0
Low/No Known	68,800	0	100	0
Total	**304,700**	**200**	**300**	**0**

Source: BLM 2012d
[1]Does not include 331,400 acres in the decision area for which the planning decision would not be mapped. These areas may be in various leasing categories, but the acreage in each category is unknown.

Under Alternative B, conservation measures in addition to RDFs would be applied as COAs to existing federal leases on 540,600 acres of PHMA overlying federal mineral estate, 213,000 acres of which are held by production. These RDFs and conservation measures would include requirements such as surface disturbance limitations, TL stipulations, noise restrictions, structure height limitations, design requirements, water development standards, remote monitoring requirements, and reclamation standards. Application of these requirements through COAs would impact fluid mineral operations by increasing costs if it resulted in the application of additional requirements and/or use of more expensive technology (such as remote monitoring systems) than would otherwise have been used by operators. To avoid these costs, operators could move to nearby state or private minerals, though these opportunities are limited.

In addition to the requirements described above, the COAs would require unitization when necessary to minimize harm to GRSG and would call for completion of Master Development Plans for developing fluid mineral resources prior to processing individual APDs to help with analysis and application of appropriate RDFs and COAs to individual APDs. Requiring Master Development Plans and unitization could cause direct impacts on fluid minerals through increased costs of oil and gas extraction by delaying the permit approval process until such additional site-specific planning efforts are completed.

The BLM and Forest Service could not apply COAs that would eliminate reasonable opportunities to develop the lease. Therefore, although costs of development would increase where COAs were applied, oil and gas development would still be able to occur.

Exploration would be allowed on the 3,328,800 acres of federal mineral estate within PHMA but would be subject to TL stipulations and other restrictions. Most notably, exploration would be allowed only for gathering information about fluid mineral resources outside PHMA (e.g., evaluating source areas, potential migration paths, and structure of the area). Because of these limitations and the fact that PHMA would be closed to new fluid mineral leasing, exploration in PHMA would decrease under this alternative. Decreases in exploration in PHMA could reduce the availability of data on fluid mineral resources and could increase costs of fluid mineral development if the limitations required use of more expensive exploration technology (such as helicopter portable drilling). TL stipulations on exploration would delay development activities and could cause equipment shortages because all exploration would be occurring during the same period.

Uintah Population Area. **Table 4.31** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. Under Alternative B, 84,800 acres (22 percent) of federal mineral estate in the Uintah Population Area with high potential would be closed to new oil and gas leasing. Impacts of this closure would be the same types as those described under Alternative A; however, because 6 times more acres with high potential would be closed to new leasing under Alternative B, the magnitude of those impacts would increase.

Under this alternative, it is projected that 1,308 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Uintah Population Area in the next 15 years. This represents a 5 percent decrease in projected wells on federal mineral estate compared with Alternative A. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Carbon Population Area. **Table 4.31** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. Under Alternative B, 75,500 acres (72 percent) of federal mineral estate in the Carbon Population Area with high potential would be closed to new oil and gas leasing. Impacts of this closure would be the same type as those described under Alternative A; however, because twice as many acres with high potential would be closed under Alternative B, the magnitude of those impacts would increase. Another 124,800 acres with moderate potential would be closed under this alternative—5 times more acres with moderate potential than would be closed under Alternative A.

Under this alternative, it is projected that 751 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Carbon Population Area in the next 15 years. This represents a 22-percent decrease in projected wells on federal mineral estate compared with Alternative A. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Emery Population Area. **Table 4.31** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. Under Alternative B, 3,100 acres (62 percent) of federal mineral estate in the Emery Population Area with high potential would be closed to new oil and gas leasing, compared with zero acres with high potential closed under Alternative A. The types of impacts of this closure would be the same as those described for the *Utah Sub-region (Total Decision Area)* under Alternative A; however, the magnitude of those impacts would increase.

Under this alternative, the number of new wells projected to be drilled on the difficult-to-access resources in the Emery Population Area in the next 15 years is the same as that under Alternative A.

Rich Population Area. **Table 4.31** breaks down the acres within the population areas by whether they would be open or closed to new leasing and what stipulations would be applied to new leases. Under Alternative B, 227,200 acres (100 percent) of federal mineral estate in the Rich Population Area with high potential would be closed to new oil and gas leasing compared to zero acres with high potential closed under Alternative A. Approximately 96 percent of acres with moderate potential in the population area would be closed, and over 99 percent of acres with low or no known potential in the population area would be closed. The Rich Population Area contains the highest number of isolated leases in the planning area (less than two percent of the leased acreage in the population area). These leases may not be developed if the surrounding acres cannot be leased. However, as described under Alternative A, much of the oil and gas resources in the population area have already been developed and little future development is expected.

Under this alternative, it is projected that six new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Rich Population Area in the next 15 years. This represents a 54-percent decrease in projected wells on federal mineral estate compared with Alternative A.

Alternative C

Special Status Species – GRSG

Under Alternative C, a disturbance cap of 3 percent of PHMA within a population area would be applied to all surface disturbances, including fluid mineral development. In PHMA where the 3 percent cap is already exceeded, no new fluid mineral leases would be issued until habitat within the PHMA was restored to a point that acreage of disturbance was below the 3 percent cap. Because non-anthropogenic disturbances such as severe wildfire and heavy grazing would be counted under this alternative, more areas may exceed the disturbance cap under Alternative C than under Alternative B. The Uintah Population Area would exceed the 3 percent disturbance cap under this alternative, and the Carbon population area would be close to exceeding the

disturbance cap. Additionally, PHMA in sub-areas within the Uintah and Carbon Population Areas would exceed the 3 percent cap. The Hamlin Valley and Box Elder Population Areas would also exceed the 3 percent cap under this alternative, but these population areas do not have significant fluid mineral activity. Because all federal mineral estate in PHMA would be closed to new fluid mineral leasing under Alternative C, new fluid mineral leases would not be impacted by the disturbance cap. Valid existing lease rights would be honored, but mitigation measures may be required for development in the population areas or sub-areas that exceed the 3 percent disturbance cap.

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact fluid minerals. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative C, all BLM-administered and National Forest System surface within mapped occupied habitat (3,313,800 acres, or 100 percent of BLM-administered and National Forest System surface in the decision area) would be managed as ROW exclusion areas. However, because the entire decision area would be closed to new fluid mineral leasing under Alternative C, managing areas as ROW exclusion in the decision area would only impact existing leases.

Mineral Development
Management actions for mineral programs other than mineral materials and fluid minerals would not impact fluid minerals. Therefore, only the impacts from mineral materials and fluid mineral management actions are discussed in the paragraphs below.

Mineral Materials
Under Alternative C, approximately 4,008,600 acres of federal mineral estate (the entire federal mineral estate decision area) would be closed to mineral material disposal. This includes all acres with mineral material occurrence in the decision area. However, because the entire federal mineral estate decision area would be closed to fluid mineral leasing under Alternative C, closing the decision area to mineral material disposal would only impact existing fluid mineral leases. Closing areas to mineral material disposal could deter existing leases in those areas from constructing new roads due to a lack of available road material and could therefore decrease overall development of federal fluid minerals in the planning area. However, operators could purchase gravel from elsewhere and transport it where needed.

Fluid Minerals

Utah Sub-region (Total Decision Area). Under Alternative C, all federal mineral estate in the decision area (4,008,600 acres) would be closed to new oil and gas leasing. Closure of the federal mineral estate would directly impact the fluid minerals program in the manner described under Alternative A; however, because 29 times more acres would be closed under Alternative C, the magnitude of those impacts would increase. This alternative would prohibit any new oil and gas leases from being issued within the decision area but would not prevent continued reasonable development of existing mineral leases. **Table 4.32** breaks down the acres closed to new oil and gas leases within the decision area by oil and gas occurrence potential (high,

moderate, and low or no known potential). Approximately 18 percent of the acres closed to new leasing would have high potential.

Table 4.32
Oil and Gas Leasing Categories in the Decision Area, Alternative C[1]

Oil and Gas Potential	Closed to New Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
Total Decision Area				
High	738,800	0	0	0
Moderate	863,600	0	0	0
Low/No Known	2,219,200	0	0	0
Total	**3,821,600**	**0**	**0**	**0**
Uintah Population Area				
High	398,700	0	0	0
Moderate	19,500	0	0	0
Low/No Known	273,000	0	0	0
Total	**691,200**	**0**	**0**	**0**
Carbon Population Area				
High	112,900	0	0	0
Moderate	140,700	0	0	0
Low/No Known	54,300	0	0	0
Total	**307,900**	**0**	**0**	**0**
Emery Population Area				
High	5,000	0	0	0
Moderate	33,300	0	0	0
Low/No Known	54,700	0	0	0
Total	**93,000**	**0**	**0**	**0**
Rich Population Area				
High	217,200	0	0	0
Moderate	16,700	0	0	0
Low/No Known	47,100	0	0	0
Total	**281,000**	**0**	**0**	**0**

Source: BLM 2012d
[1]Does not include 234,500 acres in the decision area for which the planning decision would not be mapped. These areas may be in various leasing categories, but the acreage in each category is unknown.

Management actions applicable to existing leases under Alternative C would be similar to those under Alternative B, but they would apply to 895,200 acres of existing leases on federal mineral estate (all existing federal leases in the decision area). In addition to applying the restrictive management under Alternative B to more acres, Alternative C would also call for COAs implementing seasonal restrictions on vehicle traffic and human presence associated with exploratory drilling. This alternative also would limit new surface disturbance on existing leases to 3 percent per section, with some exceptions. Impacts of these operating and siting restrictions would be the same type as those described under Alternative B, although the magnitude of the impacts would increase.

Under this alternative, it is projected that 1,654 new oil and gas wells would be drilled on existing leases on federal mineral estate in the decision area in the next 15 years. This represents a 32-percent decrease in projected wells on federal mineral estate compared with Alternative A, the greatest projected decrease of all the alternatives.

A total of 187,000 acres within the decision area would have no fluid minerals planning decision. If the BLM or Forest Service received an expression of interest in leasing within these areas, additional leasing-specific NEPA analysis would need to be completed before this leasing could occur.

Under Alternative C, exploration for leasable minerals would be prohibited on all 4,008,600 acres of federal mineral estate within the decision area. Closing the decision area to exploration for leasable minerals could reduce the availability of data on fluid mineral resources outside the decision area and could increase costs of fluid mineral development if it resulted in the need to conduct exploration for resources outside the decision area via less easily accessible locations than the locations within the decision area from which exploration might otherwise occur. Because the right to conduct exploration is not part of a lease right, prohibiting exploration in the decision area could reduce development of oil and gas resources in the decision area, even on existing leases. Operators with existing leases would not be able to conduct new exploration on those leases.

Uintah Population Area. **Table 4.32** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. As described above under Alternative C, *Utah Sub-region (Total Decision Area)*, all federal mineral estate under this alternative would be closed to new oil and gas leasing, including 691,200 acres within the Uintah Population Area, of which 398,700 acres (58 percent) have high development potential for oil and gas. Impacts of this closure would be the same type as those described under Alternative A; however, because 14 times more acres with high potential would be closed to new leasing, as would the entire decision area, the magnitude of those impacts would increase.

Under this alternative, it is projected that 960 new oil and gas wells would be drilled on existing leases on federal mineral estate in the Uintah Population Area in the next 15 years. This represents a 30-percent decrease in projected wells on federal mineral estate compared with Alternative A, the greatest decrease in projected wells of all the alternatives. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Carbon Population Area. **Table 4.32** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. As described above under Alternative C, *Utah Sub-region (Total Decision Area)*, all federal mineral estate under this alternative would be closed to new oil and gas leasing, including 307,900 acres within the Carbon Population Area, of which 112,900 acres (37 percent) have high development potential for oil and gas. Impacts of this closure would be the same type as those described under Alternative A; however, because 3 times more acres with high potential would be closed to new leasing, as would the entire decision area, the magnitude of those impacts would increase.

Under this alternative, it is projected that 636 new oil and gas wells would be drilled on existing leases on federal mineral estate in the Carbon Population Area in the next 15 years. This represents a 34-percent decrease in projected wells on federal mineral estate in the population area compared with Alternative A, the greatest decrease in projected wells of all the alternatives. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Emery Population Area. **Table 4.32** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. As described above under Alternative C, *Utah Sub-region (Total Decision Area)*, all federal mineral estate under this alternative would be closed to all new oil and gas leasing, including 93,000 acres within the Emery Population Area. A total of 5,000 acres (5 percent of the federal mineral estate that would be closed within the population area) of federal mineral estate with high development potential would be closed, compared with zero acres under Alternative A. The types of impacts of this closure would be the same as those described for the *Utah Sub-region (Total Decision Area)* under Alternative A; however, the magnitude of those impacts would increase. As described under Alternative A, little future development is expected in this population area.

Under this alternative, it is projected that 23 new oil and gas wells would be drilled on existing leases on federal mineral estate in the Emery Population Area in the next 15 years. This represents a 43 percent decrease in projected wells on federal mineral estate in the population area compared with Alternative A.

Rich Population Area. **Table 4.32** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. As described above under Alternative C, *Utah Sub-region (Total Decision Area)*, all federal mineral estate under this alternative would be closed to all new oil and gas leasing, including 281,000 acres within the Rich Population Area. A total of 217,200 acres (77 percent of the federal mineral estate that would be closed within the population area) of federal mineral estate with high development potential would be closed, compared with zero acres under Alternative A. The types of impacts of this closure would be the same as those described for the *Utah Sub-region (Total Decision Area)* under Alternative A; however, the magnitude of those impacts would increase. As described under Alternative A, much of the oil and gas resources in the population area have already been developed, and little future development is expected.

Under this alternative, the number of new wells projected in the Rich Population Area is the same as that under Alternative B.

Alternative D

Special Status Species – GRSG

Under Alternative D, a disturbance cap of 5 percent of PHMA within a population area would be applied to all anthropogenic surface disturbance, including fluid mineral development. In PHMA where the 5 percent cap is already exceeded, no new fluid mineral leases would be issued until habitat within the PHMA was restored to a point that acreage of anthropogenic

disturbance was below the 5 percent cap. Major disturbances not directly related to land uses managed by the BLM or Forest Service, such as towns, airports, reservoirs, large burn areas, and agricultural areas, would not count toward the disturbance cap but would be excluded from the PHMA and therefore could reduce the area within which additional disturbance would be permitted by the BLM or Forest Service. While no population area contains anthropogenic disturbance of more than 5 percent of PHMA, PHMA in sub-areas within the Uintah and Carbon Population Areas would exceed the 5 percent cap. Issuance of new leases in these areas could be prohibited until sufficient habitat restoration had occurred. Valid existing lease rights would be honored, but mitigation measures may be required for development in the population areas or sub-areas that exceed the 5 percent disturbance cap.

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact fluid minerals. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative D, all BLM-administered and National Forest System surface within PHMA not already managed as ROW exclusion would be managed as ROW avoidance for surface and underground linear ROWs (including pipelines and roads). As a result, 2,754,200 acres (83 percent) of BLM-administered and National Forest System surface in the decision area would be managed as ROW avoidance for these types of ROWs, and 27,600 acres (less than 1 percent) would be managed as ROW exclusion. Oil and gas, oil shale, and tar sands leases beneath BLM-administered and National Forest System surface in PHMA would be indirectly impacted in the manner described under Alternatives A and B; however, because all BLM-administered and National Forest System surface would be managed as either ROW avoidance or ROW exclusion under Alternative D, the magnitude of impacts would increase. Impacts would be mitigated by the allowance of new ROWs with limitations on noise and disturbance. Impacts would also be mitigated for existing leases in PHMA because collocation of new ROWs close to existing ROWs and minimal construction of new roads would be allowed.

Under this alternative, areas of GHMA within 1 mile of an occupied lek would also be managed as ROW avoidance with exceptions for limited development with noise, structure height, and timing restrictions. Oil and gas, oil shale, and tar sands leases beneath BLM-administered and National Forest System National Forest System surface within 1 mile of an occupied lek would be impacted in the manner described under Alternative A. Impacts would be mitigated where the ROW avoidance requirement was waived in exchange for off-site mitigation activities. However, the expense of these mitigation activities would increase the costs of oil and gas development.

Mineral Development
Management actions for mineral programs other than mineral materials and fluid minerals would not impact fluid minerals. Therefore, only the impacts from mineral materials and fluid mineral management actions are discussed in the paragraphs below.

<u>Mineral Materials</u>
Under Alternative D, the BLM and Forest Service would close all PHMA to commercial mineral material disposal. Under this alternative, 2,967,500 acres (74 percent) of federal mineral estate

within the decision area would be closed to commercial mineral material disposal but open to noncommercial mineral material disposal. This includes 1,030,900 acres with mineral material occurrence (79 percent of federal mineral estate with mineral material occurrence in the decision area). Additionally, 352,800 acres of federal mineral estate within PHMA (9 percent of the decision area) would be closed to both commercial and noncommercial mineral material disposal, 103,200 acres of which have mineral material occurrence (8 percent of federal mineral estate with mineral material occurrence in the decision area). Impacts on fluid minerals of these closures (including closures to commercial mineral material disposal) would be the same type as those described for closure to overall mineral material disposal under Alternative A; however, because more acres of federal mineral estate would be closed to commercial mineral materials disposal under Alternative D, the magnitude of those impacts would increase.

Fluid Minerals

Utah Sub-region (Total Decision Area). Under Alternative D, the BLM and Forest Service would apply a buffer system to manage oil and gas development in and adjacent to occupied habitat. Under this system, leks would be surrounded by buffers of varying sizes in which NSO and/or CSU/TL stipulations would apply. In addition, CSU and/or TL stipulations would apply to all areas within occupied habitat that are outside a lek buffer. The CSU stipulations would include noise and tall structure limitations and, at times, a site-specific plan of development to limit habitat fragmentation. The TL stipulations would prohibit oil and gas development and maintenance activities disruptive to GRSG in breeding and nesting, brood-rearing, and winter habitats during certain times of year. In areas containing all three of these habitats, the TL stipulations could overlap such that oil and gas development activities would only be permitted in those areas from July 15 to November 15. Limiting oil and gas development activities to 4 months of the year could essentially close an area to oil and gas development. The buffer system would result in application of NSO and CSU/TL restrictions to some areas outside but adjacent to occupied habitat. Application of these surface-disturbance restrictions, TL stipulations, and other operating standards would limit the siting, design, and operations of oil and gas development projects in the manner described under Alternative A; however, because these restrictions and standards would be applied throughout the decision area under Alternative D and because the TL stipulations could be much more stringent if they overlapped in an area, the magnitude of the impacts would increase. These impacts would be mitigated in GHMA where off-site mitigation could allow operators to waive the applicable stipulations.

Table 4.33 breaks down the acres within the decision area by whether they would be open or closed to new leasing and what stipulations may be applied. This breakdown is done by oil and gas occurrence potential (high, moderate, and low or no known potential).

Under Alternative D, the number of acres closed to all new fluid mineral leasing would be the same as that under Alternative A, with the same impacts. Four times more acres would be subject to NSO stipulations under Alternative D than Alternative A. However, of these acres, 1,270,200 (69 percent) would have low or no known potential. The number of high potential acres subject to NSO stipulations under Alternative D would be 18 times higher than the high potential acres subject to NSO stipulations under Alternative A and would equal 35 percent of

Table 4.33
Oil and Gas Leasing Categories in the Decision Area, Alternative D[1]

Oil and Gas Potential	Closed to New Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
Total Decision Area				
High	31,600	278,500	431,500	0
Moderate	42,200	304,000	517,400	0
Low/No Known	64,700	1,270,200	879,800	0
Total	**138,500**	**1,852,700**	**1,828,700**	**0**
Uintah Population Area				
High	14,000	66,800	320,600	0
Moderate	1,300	1,800	16,400	0
Low/No Known	53,500	134,300	85,200	0
Total	**68,800**	**202,900**	**421,200**	**0**
Carbon Population Area				
High	17,500	40,700	54,700	0
Moderate	9,900	85,500	45,200	0
Low/No Known	0	17,000	8,800	0
Total	**27,400**	**143,200**	**108,700**	**0**
Emery Population Area				
High	0	570	4,400	0
Moderate	0	15,500	17,800	0
Low/No Known	0	36,800	17,800	0
Total	**0**	**52,870**	**40,000**	**0**
Rich Population Area				
High	0	170,200	47,000	0
Moderate	0	4,090	12,600	0
Low/No Known	0	6,690	40,400	0
Total	**0**	**180,980**	**100,000**	**0**

Source: BLM 2012d
[1]Does not include 177,200 acres in the decision area for which the planning decision would not be mapped. These areas may be in various leasing categories, but the acreage in each category is unknown.

all federal mineral estate with high potential in the decision area. As noted under Alternative A, restrictive management of high potential acres has the greatest impact on fluid minerals. There would be a 39-percent increase in acres subject to CSU and/or TL stipulations under Alternative D compared with Alternative A. Overall, the impact of these types of stipulations would increase from Alternative A, increasing the restrictions on fluid mineral development in the decision area and reducing the amount of that development.

Under this alternative, it is projected that 2,213 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the population areas in the next 15 years. This represents an 8-percent decrease in projected wells on federal mineral estate compared with Alternative A.

A total of 187,000 acres within the decision area would have no fluid minerals planning decision. If the BLM or Forest Service received an expression of interest in leasing within these areas, additional leasing-specific NEPA analysis would need to be completed before this leasing could occur.

Design features similar to those described under Alternative B would be applied in PHMA to new leases as stipulations and to existing leases as COAs (subject to valid existing rights) under Alternative D. However, exceptions to application of RDFs could mitigate impacts. Exceptions would occur where a design feature was not applicable (e.g., a resource is not present on a given site) or where the design feature would not actually provide additional protection for GRSG or its habitat. See **Table 2.4** for more information on when these exceptions to RDFs would apply.

The conservation measures applied under Alternative D would also differ from Alternative B. A 5 percent disturbance limit would apply instead of a 3 percent limit, and surface occupancy buffers and TL stipulations would not apply to surface disturbance; rather, surface disturbance would minimize habitat loss, fragmentation, and direct and indirect effects on GRSG and its habitat. The impacts of applying these RDFs and conservation measures would be the same type as those described under Alternative B, but the magnitude of the impacts would be reduced under Alternative D because the conservation measures would be less restrictive than those under Alternative B. On- or off-site mitigation would be used to minimize impacts on GRSG. Where operators used such mitigation to protect GRSG, oil and gas development costs would increase compared with Alternative A due to the additional expense of mitigation activities.

Under Alternative D, unitization would be encouraged but would not be required. Impacts would be the same as those under Alternative A.

Exploration would be allowed in the decision area under Alternative D, but seasonal restrictions would apply in nesting, brood-rearing, and winter habitat. While these restrictions would continue to apply to exploration in some areas under Alternative A, more consistent application under Alternative D would increase impacts on fluid minerals due to a potential decrease in exploration compared with Alternative A. Impacts of this decrease would be the same type as those described under Alternative B.

Uintah Population Area. **Table 4.33** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Under Alternative D, the same number of acres of federal mineral estate in the Uintah Population Area with high potential would be closed to all new oil and gas leasing as under Alternative A. However, 66,800 acres with high potential would be subject to NSO stipulations, 10 times more than the acres of high potential subject to the same stipulations under Alternative A. In addition, 320,600 acres with high potential would be subject to CSU and/or TL stipulations, a 36-percent increase from Alternative A.

Under this alternative, it is projected that 1,320 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the Uintah Population Area in the next 15 years. This represents a 4-percent decrease in projected wells on federal mineral estate from

Alternative A. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Carbon Population Area. **Table 4.33** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Under Alternative D, 17,500 acres of federal mineral estate in the Carbon Population Area with high potential would be closed to all new oil and gas leasing, a 44-percent decrease from Alternative A. A total of 40,700 acres of federal mineral estate with high potential in the population area would be subject to NSO stipulations under Alternative D, an 18-percent increase from Alternative A.

Under this alternative, it is projected that 811 new oil and gas wells would be developed on federal mineral estate in the Carbon Population Area in the next 15 years. This represents a 16-percent decrease in projected wells on federal mineral estate compared with Alternative A. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Emery Population Area. **Table 4.33** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under Alternative D, no federal mineral estate in the Emery Population Area with high potential would be closed to all new oil and gas leasing. Acres subject to NSO stipulations would decrease from 7,900 acres under Alternative A to 570 acres under Alternative D. However, acres subject to CSU and/or TL stipulations would increase under Alternative D to 4,400 acres (147 times the acres with high potential subject to those stipulations under Alternative A). As described under Alternative A, little future development is expected in this population area.

Under this alternative, the number of new wells projected to be drilled on new and existing leases in the Emery Population Area in the next 15 years is the same as under Alternative A.

Rich Population Area. **Table 4.33** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under Alternative D, all federal mineral estate in the Rich Population Area would be open to oil and gas leasing. However, 170,200 acres with high oil and gas potential would be subject to NSO stipulations under Alternative D, compared with zero acres under Alternative A. Impacts of these NSO stipulations would be the same type as those described for the *Utah Sub-region (Total Decision Area)* under Alternative A; however, the magnitude of those impacts within the Rich Population Area would greatly increase under Alternative D. Acres of federal mineral estate with high oil and gas potential subject to CSU and/or TL stipulations would decrease by 72 percent from Alternative A, to 47,000 acres under Alternative D.

Under this alternative, it is projected that nine new oil and gas wells would be developed on federal mineral estate in the Rich Population Area in the next 15 years. This represents a 31-percent decrease in projected wells on federal mineral estate compared with Alternative A. However, as described under Alternative A, much of the oil and gas resources in the population area have already been developed, and little future development is expected.

Alternative E

Special Status Species – GRSG

Under Alternative E, a disturbance cap of 5 percent of state or federally managed lands in SGMAs/core areas would be applied to all anthropogenic surface disturbances, including fluid mineral development. In SGMAs/core areas where the 5 percent cap is already exceeded, no new fluid mineral leases would be issued until habitat within the SGMA/core area was restored to a point that acreage of anthropogenic disturbance on state or federally managed lands was below the 5 percent cap. Although baseline disturbance acreages for this alternative have not been calculated for this high-level plan due to uncertainty in actual habitat areas, issuance of new leases in some areas could be prohibited. Valid existing lease rights would be honored, but mitigation measures may be required at the implementation level for development in areas that exceed the 5 percent disturbance cap.

Infrastructure Development (including all ROWs and utility corridors)

Management actions for programs related to infrastructure development other than lands and realty would not impact fluid minerals. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative E, all BLM-administered and National Forest System surface within mapped GRSG habitat in SGMAs/core areas not already managed as ROW exclusion would be managed as ROW avoidance. As a result, 2,654,000 acres (80 percent) of BLM-administered and National Forest System surface in the decision area would be managed as ROW avoidance, and 27,600 acres (1 percent) would be managed as ROW exclusion. Oil and gas leases beneath BLM-administered and National Forest System surface in mapped GRSG habitat in SGMAs/core areas would be indirectly impacted in the manner described under Alternative A; however, because the acres managed as ROW avoidance would increase from Alternative A, the magnitude of these impacts would increase. Impacts would be mitigated by the allowance of new ROWs with limitations on noise, timing, and disturbance or where avoidance was not possible. However, mitigation would be required and would increase the costs of oil and gas development.

Under Alternative E, no management actions from this LUPA would apply to the 650,700 acres of BLM-administered and National Forest System surface outside of mapped GRSG habitat in SGMAs/noncore areas (20 percent of the decision area). Management of these areas and impacts on fluid minerals of that management would be the same as Alternative A.

Mineral Development

Management actions for mineral programs other than mineral materials and fluid minerals would not impact fluid minerals. Therefore, only the impacts from mineral materials and fluid mineral management actions are discussed in the paragraphs below.

<u>Mineral Materials</u>

Under Alternative E, all federal mineral estate not closed to mineral material disposal under Alternative A would remain open (3,932,200 acres, or 98 percent of the decision area), including 1,325,600 acres with mineral material occurrence. Additional restrictions would apply to the 3,262,500 acres of federal mineral estate within mapped GRSG habitat in SGMAs/core areas (81 percent of the decision area), including maximum cumulative new permanent disturbance from

mineral materials development of no more than 5 percent of mapped GRSG habitat in SGMAs/core areas in each population area. Noise, structure height, and TL stipulations would also apply. These restrictions could decrease the amount of mineral material development on federal mineral estate in mapped GRSG habitat in SGMAs/core areas, which would impact fluid minerals as described under Alternative A. Because additional restrictions would be applied under Alternative E, impacts on fluid minerals could increase compared with Alternative A.

Fluid Minerals

Utah Sub-region (Total Decision Area). Under Alternative E, 687,500 acres (17 percent) of federal mineral estate in the decision area, including all areas within 1 mile of a lek located in mapped GRSG habitat in SGMAs/core areas, would be subject to NSO stipulations and 2,620,100 acres, or 65 percent of the decision area) would be subject to CSU and TL stipulations. The CSU stipulations would include limitations on disturbance, siting, and noise. Impacts of these NSO stipulations would be the same as those described under Alternative A and impacts of CSU stipulations and TL stipulations would be the same type as those described under Alternative D. **Table 4.34** breaks down the acres within the decision area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. This breakdown is done by oil and gas occurrence potential (high, moderate, and low or no known potential).

Like Alternative A, under Alternative E, 31,600 acres of federal mineral estate with high oil and gas occurrence potential would be closed to new fluid mineral leasing. Approximately 49,900 acres with high potential would be subject to NSO stipulations (3 times that under Alternative A), and 493,000 acres with high potential would be subject to CSU and/or TL stipulations (a 10-percent increase compared with Alternative A). Therefore, overall restrictions imposed by stipulations on oil and gas development would increase under Alternative E.

A total of 187,000 acres within the decision area would have no fluid minerals planning decision. If the BLM or Forest Service received an expression of interest in leasing within these areas, additional leasing-specific NEPA analysis would need to be completed before this leasing could occur.

The number of new wells projected to be drilled on new and existing leases in the Utah Sub-region under Alternative E is the same as that under Alternative A.

CSU and TL stipulations would apply to exploration within mapped GRSG habitat in SGMAs/core areas, potentially causing a decrease in exploration from Alternative A. Impacts of this decrease in exploration would be the same type as those described under Alternative B.

Under Alternative E, no management actions from this LUPA would apply to the 805,900 acres of federal mineral estate in mapped GRSG habitat outside SGMAs/noncore areas (20 percent of the decision area). Management of these areas and impacts of that management would be the same as described under Alternative A.

Management of the 445,900 acres of existing leases in mapped GRSG habitat in SGMAs/core areas would be the same as under Alternative A.

Table 4.34
Oil and Gas Leasing Categories in the Decision Area, Alternative E[1]

Oil and Gas Development Potential	Closed to New Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
Total Decision Area				
High	31,600	49,900	493,000	119,500
Moderate	42,200	106,100	614,200	65,900
Low/No Known	64,700	531,500	1,512,900	61,700
Total	**138,500**	**687,500**	**2,620,100**	**247,100**
Uintah Population Area				
High	14,000	12,700	245,700	100,300
Moderate	1,280	630	12,800	330
Low/No Known	53,500	36,300	177,000	3,820
Total	**68,780**	**49,600**	**435,500**	**104,450**
Carbon Population Area				
High	17,500	10,100	57,000	16,200
Moderate	9,900	27,300	79,300	7,900
Low/No Known	0	2,320	51,700	0
Total	**27,400**	**39,700**	**187,900**	**24,100**
Emery Population Area				
High	0	550	2,110	2,350
Moderate	0	10,900	19,800	2,540
Low/No Known	0	13,400	38,062	3,250
Total	**0**	**24,800**	**60,000**	**8,140**
Rich Population Area				
High	0	26,400	185,700	0
Moderate	0	1,040	7,300	0
Low/No Known	0	210	44,200	0
Total	**0**	**27,600**	**237,200**	**0**

Source: BLM 2012d
[1]Does not include 329,800 acres in the decision area for which the planning decision would not be mapped. These areas may be in various leasing categories, but the acreage in each category is unknown.

Uintah Population Area. **Table 4.34** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under Alternative E, 14,000 acres of federal mineral estate in the Uintah Population Area with high potential would be closed to all new oil and gas leasing. Acres with high potential subject to NSO stipulations would increase by 81 percent to 12,700 acres compared with Alternative A. Under Alternative E, acres with high oil and gas potential subject to CSU and/or TL stipulations would increase 4 percent from Alternative A to 245,700 acres. Types of impacts are described under Alternative A; however, these cost impacts would increase under Alternative D because CSU and/or TL stipulations would be applied to more acres.

Under this alternative, the number of new wells projected to be drilled on new and existing leases in the Uintah Population Area is the same as under Alternative A. As described under

Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Carbon Population Area. **Table 4.34** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative D, under Alternative E, 17,500 acres of federal mineral estate in the Carbon Population Area with high potential would be closed to all new oil and gas leasing. Acres with high potential subject to NSO stipulations would decrease 71 percent from Alternative A to 10,100. Acres with high potential subject to CSU and/or TL stipulations would decrease 36 percent from Alternative A to 57,000. Impacts of these stipulations would be the same type as those described under Alternative A; however, the cost impacts would decrease under Alternative E because CSU and/or TL stipulations would apply to fewer acres with high potential.

Under this alternative, the number of new wells projected to be drilled on new and existing leases in the Carbon Population Area is the same as under Alternative A. As described under Alternative A, this population area is expected to be a primary area for future oil and gas development in the Utah Sub-region.

Emery Population Area. **Table 4.34** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under Alternative E, all federal mineral estate in the Emery Population Area with high potential would be open to oil and gas leasing. Acres with high potential subject to NSO stipulations would decrease 93 percent from Alternative A to 550 acres. Acres with high potential subject to CSU and/or TL stipulations would increase 70 times from Alternative A to 2,110 acres. Because fewer acres would be subject to NSO stipulations and more acres would be subject to CSU and/or TL stipulations under this alternative, resource availability impacts would decrease from Alternative A, but costs of development could increase. The types of cost and resource availability impacts would be the same as those described under Alternative A. As described under Alternative A, little future development is expected in this population area.

Under this alternative, the number of new wells projected to be drilled on new and existing leases in the Emery Population Area in the next 15 years is the same as that under Alternative A.

Rich Population Area. **Table 4.34** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under Alternative E, all federal mineral estate in the Rich Population Area with high potential would be open to oil and gas leasing. However, acres with high potential subject to NSO stipulations would increase to 26,400 acres, compared with 0 acres under Alternative A. The acres with high potential subject to CSU and/or TL stipulations would increase 12 percent from Alternative A to 185,700 acres. The types of impacts from these stipulations would be the same as those described under Alternative A; however, because more acres would be subject to CSU and/or TL stipulations under Alternative E, the cost impacts of those stipulations would increase. As described under Alternative A,

much of the oil and gas resources in the population area have already been developed, and little future development is expected.

Under this alternative, the number of new wells projected to be drilled on new and existing leases in the Rich Population Area is the same as that under Alternative A.

Proposed Plans

Special Status Species – GRSG

Application of the 3 percent disturbance cap (5 percent on National Forest System lands in Wyoming) in PHMA could impact both new and existing fluid mineral activities by preventing or restricting new surface development. New fluid mineral activities could be precluded if the cap were exceeded in a BSU or a proposed project analysis area. New surface development on existing leases could be restricted if the cap were exceeded. However, the BLM would not apply the disturbance cap in a manner that would eliminate reasonable opportunities to develop an existing lease. Currently there are no population areas where the density of disturbance exceeds the disturbance cap. However, there are areas within 4 miles of a lek in population areas that are near or exceeding the disturbance cap, including in the Carbon and Uintah Population Areas where there is higher potential for oil and gas.

Application of lek buffers in GHMA could impact new and existing fluid mineral activities by restricting new surface development. Lek buffers in PHMA would not impact fluid mineral development because all PHMA would be subject to NSO stipulations. Any development for which the limited exception to the NSO stipulation were granted would not be within the lek buffer. In GHMA, applying lek buffer distances when approving actions for linear features, infrastructure related to energy development, tall structures (including transmission lines), surface disturbance, and noise could also restrict development of infrastructure related to fluid mineral development, especially in areas of high potential for oil and gas.

In PHMA, the density of energy and mining facilities would be limited to one energy/mining facility per 640 acres. When calculated at the project level, this requirement would push developers to consolidate facilities and, where technically feasible, directionally or horizontally drill from outside of GRSG habitat.

RDFs would be applied as under the action alternatives in PHMA and GHMA, and impacts would be similar in nature and magnitude to Alternative D. In addition to the RDFs, disturbance cap, lek buffers, and density restrictions, additional conservation measures in PHMA would include net conservation gain requirements (also a requirement in GHMA), restrictions on noise and tall structures, and seasonal restrictions. All of these combined would further restrict oil and gas development compared with Alternative A. In the Carbon and Uintah Population Areas, where oil and gas potential is relatively high and some areas are at or exceeding the disturbance cap, the cumulative effect of all of the restrictions would likely reduce opportunities for oil and gas development on public lands.

Exploration would be allowed on federal mineral estate within GRSG habitat but would be subject to seasonal restrictions. Because of these limitations, exploration in GRSG habitat would decrease under this alternative compared with Alternative A.

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact fluid minerals. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under the Proposed Plans, all BLM-administered and National Forest System surface within PHMA not already managed as ROW exclusion would be managed as ROW avoidance for new linear and site-type ROWs (including transmission lines, pipelines, and roads), except for within ROW corridors designated for aboveground use. As a result, 2,764,800 acres (80 percent) of BLM-administered and National Forest System surface in the decision area would be managed as ROW avoidance for these types of ROWs, and 10,500 acres (less than 1 percent) would be managed as ROW exclusion. However, because all acres in PHMA would be either closed to leasing or open subject to NSO stipulations, no oil and gas activities on future leases within these areas would require new ROWs. Existing oil and gas leases beneath BLM-administered and National Forest System surface in PHMA would be indirectly impacted in the manner described under Alternatives A and B; however, because all BLM-administered and National Forest System surface would be managed as either ROW avoidance or ROW exclusion under the Proposed Plans, the magnitude of impacts would increase. Impacts would be mitigated for existing leases in PHMA because collocation of new ROWs close to existing ROWs and minimal construction of new roads would be allowed. In PHMA, ROW development that was able to occur would be subject to RDFs, lek buffers, the disturbance cap, and limitations for tall structures, and net conservation gain requirements, which could impact fluid minerals development as discussed under *Special Status Species – GRSG*. The expense of these mitigation activities would increase the costs of oil and gas development.

Under the Proposed Plans, GHMA would be available for the types of ROW location that would impact fluid minerals development, except for 17,600 acres already managed as exclusion. While fluid minerals development would not be directly impacted because of ROW avoidance or exclusion areas, ROW development in GHMA would be subject to RDFs, lek buffers, and net conservation gain requirements, which could impact fluid minerals development as discussed under *Special Status Species – GRSG*. The expense of these mitigation activities would increase the costs of oil and gas, oil shale, and tar sands development.

Mineral Development
Management actions for mineral programs other than mineral materials and fluid minerals would not impact fluid minerals. Therefore, only the impacts from mineral materials and fluid mineral management actions are discussed in the paragraphs below.

Mineral Materials
Under the Proposed Plans, National Forest System lands in the Wyoming portion of the planning area would remain open to mineral material disposal while PHMA on lands managed according to the BLM and the Forest Service-Utah Proposed Plans would be closed to commercial mineral material disposal. Under the Proposed Plans, 3,340,200 acres (83 percent) of federal mineral estate within the decision area would be closed to most mineral material disposal but open to free use permits and expansion of existing activity pits. This includes 1,196,900 acres with mineral material occurrence (92 percent of federal mineral estate with

mineral material occurrence in the decision area). Impacts on fluid minerals of these closures (including closures to commercial mineral material disposal) would be the same type as those described for closure to overall mineral material disposal under Alternative A; however, because more acres of federal mineral estate would be closed to commercial mineral materials disposal under Proposed Plans, the magnitude of those impacts would increase.

Free use permits and expansion of existing active pits in PHMA would be subject to the disturbance cap, density of energy/mining facilities restrictions, lek buffers, RDFs, noise restrictions, seasonal restrictions, and net conservation gain requirements. These requirements, particularly on the expansion of existing active pits, would further restrict access to mineral materials and increase costs associated with fluid minerals development.

Fluid Minerals

Utah Sub-region (Total Decision Area). Under the Proposed Plans, nearly the same acres would be closed to new fluid minerals leases as under Alternative A. The differences in acreage between Alternative A and the Proposed Plans account for modified boundaries of mapped occupied GRSG habitat in the Proposed Plans; no additional areas would be closed from decisions in the Proposed Plans. Therefore, there would be no additional impacts from implementing the Proposed Plans from those in Alternative A.

Approximately 30,000 acres in GHMA would also be closed to fluid mineral leasing but this is made up of areas currently closed under Alternative A; management decisions in the Proposed Plans would not further impact oil and gas leasing from Alternative A in these areas.

Outside of the areas closed to new fluid mineral leasing, the remaining PHMA would be open to new oil and gas leasing subject to an NSO stipulation. Of this area, NSO stipulations on approximately 7 percent of federal mineral estate would not be available with waivers, exceptions, or modifications. These areas are in the Rich and Box Elder Population Areas. The Box Elder Population Area does not have high potential for oil and gas, so impacts would be minimal. Potential in the Rich Population Area is high but, as discussed in **Chapter 3**, most federal mineral estate in the Rich Population Area is already under lease, and many oil and gas fields have already been depleted. Therefore, impacts of the 233,400 acres subject to NSO with no waivers, exceptions, or modifications would be minimal.

In the remainder of PHMA, an exception to the NSO stipulation could be granted if the activity would not have direct, indirect, or cumulative effects on GRSG or its habitat or is proposed as an alternative to a similar action occurring on a nearby parcel and would provide a clear conservation gain to GRSG. Any exception must have to concurrence of the state wildlife agency and the USFWS. As such, exceptions would only be granted on rare occasions. Any development that did occur in PHMA would be subject to the pertinent management for discretionary activities (e.g., mitigation measures, disturbance cap, minerals/energy density restrictions, lek buffers, seasonal restrictions, and RDFs). Impacts of which are discussed under *Special Status Species – GRSG*.

In GHMA, the areas closed to new fluid minerals leases and subject to NSO, CSU, and TL stipulations would be nearly the same as those under Alternative A. Any differences in acreages

account for modified boundaries of PHMA and GHMA in the Proposed Plans. While the stipulations would be the same as those already identified in Alternative A, there would be additional restrictions if development were to occur. In GHMA, development would be subject to the disturbance cap, mitigation, lek buffers, and RDFs. Impacts of which are discussed under *Special Status Species – GRSG*.

Overall, acres open to fluid minerals leasing subject to NSO stipulations would be six times more than under Alternative A. However, of these acres, 2,171,700 (67 percent) would have low or no known potential. The number of high potential acres subject to NSO stipulations under the Proposed Plans would be 22 times higher than the high potential acres subject to NSO stipulations under Alternative A and would equal 44 percent of all federal mineral estate with high potential in the decision area. As noted under Alternative A, restrictive management of high potential acres has the greatest impact on fluid minerals. There would be a 78 percent decrease in acres subject to CSU and/or TL stipulations under the Proposed Plans compared with Alternative A, though the acres of high potential subject to CSU and/or TL would decrease by only about 48 percent. Overall, the impact of these types of stipulations would increase from Alternative A, increasing the restrictions on fluid mineral development in the decision area and reducing the amount of that development.

Table 4.35 breaks down the acres within the decision area by whether they would be open or closed to new leasing and what stipulations may be applied. This breakdown is done by oil and gas occurrence potential (high, moderate, and low or no known potential).

Under the Proposed Plans, it is projected that 2,210 new oil and gas wells would be drilled on new and existing leases on federal mineral estate in the population areas in the next 15 years. This represents a 9-percent decrease in projected wells on federal mineral estate compared with Alternative A.

Uintah Population Area. **Table 4.35** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Under the Proposed Plans, the same number of acres of federal mineral estate in the Uintah Population Area with high potential would be closed to all new oil and gas leasing as under Alternative A. However, 67,400 acres with high potential would be subject to NSO stipulations, 10 times more than the acres of high potential subject to the same stipulations under Alternative A. In addition, 213,900 acres with high potential would be subject to CSU and/or TL stipulations, a 42 percent decrease from Alternative A.

Carbon Population Area. **Table 4.35** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Under the Proposed Plans, 17,900 acres of federal mineral estate in the Carbon Population Area with high potential would be closed to all new oil and gas leasing, a 49-percent decrease from Alternative A. A total of 39,100 acres of federal mineral estate with high potential in the population area would be subject to NSO stipulations under the Proposed Plans, a 14-percent increase from Alternative A.

Table 4.35
Oil and Gas Leasing Categories in the Decision Area, Proposed Plans[1]

Oil and Gas Potential	Closed to New Leasing (acres)	Open Subject to NSO Stipulations (acres)	Open Subject to CSU/TL Stipulations (acres)	Open Subject to Standard Terms and Conditions (acres)
Total Decision Area				
High	32,000	347,800	232,100	118,500
Moderate	42,400	707,200	27,200	60,100
Low/No Known	65,300	2,171,700	26,000	55,300
Total	**139,700**	**3,226,800**	**285,300**	**233,800**
Uintah Population Area				
High	14,000	67,400	198,400	100,300
Moderate	1,300	5,600	11,700	300
Low/No Known	53,600	280,700	3,800	3,900
Total	**68,900**	**353,700**	**213,900**	**104,500**
Carbon Population Area				
High	17,900	39,100	32,700	15,900
Moderate	10,300	108,600	15,200	6,700
Low/No Known	0	53,200	1,000	0
Total	**28,200**	**201,000**	**48,900**	**22,600**
Emery Population Area				
High	0	2,700	15	2,300
Moderate	0	31,300	9	2,500
Low/No Known	0	51,700	52	3,200
Total	**0**	**85,600**	**76**	**8,000**
Rich Population Area				
High	0	238,500	41	0
Moderate	0	17,200	155	0
Low/No Known	0	89,900	113	0
Total	**0**	**345,600**	**309**	**0**

Source: BLM 2015
[1]Does not include 102,300 acres in the decision area for which the planning decision would not be mapped. These areas may be in various leasing categories, but the acreage in each category is unknown.

Emery Population Area. **Table 4.35** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under the Proposed Plans, no federal mineral estate in the Emery Population Area with high potential would be closed to all new oil and gas leasing. Acres subject to NSO stipulations would decrease from 7,900 acres under Alternative A to 2,700 acres under the Proposed Plans, a 66 percent decrease.

Rich Population Area. **Table 4.35** breaks down the acres within the population area by whether they would be open or closed to new oil and gas leasing and what stipulations would be applied to new oil and gas leases. Like Alternative A, under the Proposed Plans, all federal mineral estate in the Rich Population Area would be open to oil and gas leasing. However, 238,500 acres with high oil and gas potential would be subject to NSO stipulations under the Proposed Plans,

compared with zero acres under Alternative A. Impacts of these NSO stipulations would be the same type as those described for the *Utah Sub-region (Total Decision Area)* under Alternative A; however, the magnitude of those impacts within the Rich Population Area would greatly increase under the Proposed Plans. Acres of federal mineral estate with high oil and gas potential subject to CSU and/or TL stipulations would decrease to almost zero acres under the Proposed Plans.

4.21.2 Nonenergy Leasable Minerals

Methods and Assumptions

Analysis of impacts on nonenergy leasable minerals from this LUPA focuses on the impacts of conservation measures to protect GRSG. These impacts may be direct or indirect. For example, a direct impact on nonenergy leasables would result from closing an area to leasing. An indirect impact would result from removal of a road, which would change the economic feasibility of developing a site. Additional actions or conditions that might cause direct or indirect impacts on nonenergy leasables are described under *Indicators*, below.

Indicators

Indicators of impacts on nonenergy leasables are as follows:

- The amount of land closed to new nonenergy solid mineral leasing
- The amount of land closed to new nonenergy leasable surface mining
- The restrictions on surface use or timing placed on nonenergy solid mineral leasing
- The restrictions on surface use or timing placed on prospecting and exploration
- Application of RDFs to nonenergy leasable development for the protection of GRSG
- The amount of land closed to fluid mineral development
- The amount of land subject to an NSO stipulation on fluid mineral development

Assumptions

The analysis includes the following assumptions:

- Nonenergy leasable mineral operations on existing federal leases, regardless of surface ownership, could be subject to RDFs by the BLM Authorized Officer and the authorized officer of the surface management agency. Under these circumstances, existing leases would be developed consistent with applicable laws and valid existing rights, using as many of the RDFs and conservation measures as possible while still allowing reasonable access.
- Management actions apply to nonenergy leasable activity on all surface lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered and National Forest System surface and non-BLM-administered and non-National Forest System surface. There are 4,008,600 acres of federal mineral estate within the decision area (3,313,800 acres of BLM-administered and National Forest System surface with federal minerals and 694,800 acres of non-BLM-administered and non- National Forest System surface with federal minerals).

- As discussed in the Minerals section of **Chapter 3**, production rates for gilsonite and phosphate are expected to remain steady for the life of the LUPs covered by this LUPA. However, total phosphate production in the Utah Sub-region may increase with the possible opening of a new phosphate mine in Utah.

Implementing management for the following resources to protect GRSG would have negligible or no impact on nonenergy leasable minerals and are therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, Lands and Realty, and ACECs.

Alternative A

Management actions for mineral programs other than fluid minerals and nonenergy leasables would not impact nonenergy leasables. Therefore, only the impacts from fluid minerals and nonenergy leasables management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative A, 138,500 acres (3 percent) of federal mineral estate in the decision area would remain closed to new fluid mineral leasing, and 483,500 acres (12 percent) would remain subject to NSO stipulations. Closing areas to leasing would preclude oil and gas development in those areas, which could reduce demand for gilsonite in drilling muds. Application of NSO stipulations could have the same effect if the stipulations prevented oil and gas development. NSO stipulations prohibit surface disturbance in areas, so the oil and gas resources in those areas could only be accessed by directional drilling. If directional drilling was not feasible in an area, the minerals subject to the NSO stipulation would effectively be closed to new development.

Nonenergy Leasables

Under Alternative A, 3,870,080 acres (97 percent) of federal mineral estate in the decision area would remain open to leasing consideration, and 138,500 acres (3 percent) would remain closed to new prospecting and exploration and leasing. This allocation decision would impact gilsonite, phosphate, and sodium, for which the individual analyses are provided below.

Management actions that close areas to nonenergy leasable mineral prospecting and exploration and leasing would directly impact nonenergy leasable minerals by reducing the area available for prospecting and exploration and leasing. If the most lucrative resources were closed to new prospecting and exploration and leasing, developers could have to prospect and extract resources that are not as lucrative, thus decreasing profit. Nonenergy leasable mineral development operations could also move to nearby private or state minerals containing nonenergy leasable mineral resources within GRSG habitat. However, state, county, and private mineral resources are often fragmented and limited in extent. If federal closed nonenergy leasable mineral resources are surrounded by private or state resources that are developed, the federal closed resources could be wasted or isolated and unable to be developed in the future. This change would also result in lost royalties for the federal and state governments.

Table 4.36 breaks down the acres within the decision area by whether they would be open or closed to new nonenergy leasable mineral prospecting and exploration and leasing. This

breakdown is done by occurrence and potential (high, moderate, and low potential) to highlight acres of gilsonite, phosphate, and sodium where closures would be most likely to impact mineral development.

Table 4.36
Nonenergy Leasable Minerals, Alternatives A and E

Mineral Potential and Occurrence	Closed to All New Leasing (acres)	Closed to New Surface Mining/ Open to New Underground Mining (acres)[1]	Open to All Mining (acres)
Gilsonite Potential	**0**	**N/A**	74,000
High	0	N/A	12,400
Moderate	0	N/A	54,800
Low	0	N/A	6,800
Phosphate Potential	**13,400**	**N/A**	**198,200**
High	0	N/A	42,700
Moderate	0	N/A	19,300
Low	13,400	N/A	136,200
Sodium Occurrence	**0**	**N/A**	**161,400**

Source: BLM 2012d
[1] Underground mining includes surface-disturbing activities such as exploration, structures, roads, shafts, and power lines.

Existing federal nonenergy leasable mineral leases in the decision area would continue to be subject to any stipulations or BMPs contained in those leases. Application of BMPs would increase costs of nonenergy leasable development if it delayed resource development or resulted in the use of more expensive technology than would otherwise have been used. If costs increased to the extent that it was no longer economical to develop the resources, nonenergy leasable development on federal mineral estate could be reduced.

Gilsonite. Under Alternative A, the 74,000 acres of federal mineral estate with gilsonite potential in the decision area would remain open to nonenergy leasable mineral prospecting and exploration and leasing. The 2,700 acres of authorized gilsonite leases in mapped occupied habitat would continue to be subject to any surface-disturbance limitations included in those leases.

Phosphate. Under Alternative A, 13,400 acres of federal mineral estate with low phosphate potential in the decision area would remain closed to new nonenergy leasable mineral prospecting and exploration and leasing. The impacts of closing these areas to prospecting and exploration and leasing would be the same type as those described for all nonenergy leasables under Alternative A. The remaining 198,200 acres (94 percent) of federal mineral estate with phosphate potential in the decision area would remain open to nonenergy leasable mineral prospecting and exploration and leasing. This would include the 42,700 acres of federal mineral estate with high phosphate potential in the decision area.

The 9,100 acres of authorized and pending phosphate leases in the decision area would continue to be subject to any surface-disturbance limitations and/or BMPs included in those leases. Impacts of these BMPs would be the same type as described for all nonenergy leasables under Alternative A.

Sodium. Under Alternative A, the 161,400 acres of federal mineral estate with sodium occurrence in the decision area would remain open to nonenergy leasable mineral prospecting and exploration and leasing. There are no federal sodium leases in the decision area. Therefore, no existing sodium leases would be impacted by BMPs.

Alternative B

Management actions for mineral programs other than fluid minerals and nonenergy leasables would not impact nonenergy leasables. Therefore, only the impacts from fluid minerals and nonenergy leasables management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative B, 3,341,300 acres (83 percent) of federal mineral estate in the decision area would be closed to new fluid mineral leasing, and 24,400 acres (1 percent) would be subject to NSO stipulations. The types of impacts on gilsonite demand from these management actions would be the same as those described under Alternative A; however, because more acres would be closed under Alternative B, the magnitude of those impacts would increase.

Nonenergy Leasables

Under Alternative B, 3,341,300 acres, or 83 percent of the federal mineral estate decision area (including all federal mineral estate in PHMA), would be closed to new prospecting and exploration and leasing. Management under this alternative would close 24 times more federal mineral estate to nonenergy leasable mineral prospecting and exploration and leasing than management under Alternative A. This allocation decision would impact gilsonite, phosphate, and sodium, for which the individual analyses are provided below. New leases to expand existing mines for these minerals also would not be permitted. Approximately 667,300 acres (17 percent) of federal mineral estate in the decision area would be open to leasing consideration. Closing areas to nonenergy mineral prospecting and exploration and leasing would result in the same type of impacts as described under Alternative A.

Table 4.37 breaks down the acres within the decision area by whether they would be open or closed to new nonenergy leasable mineral prospecting and exploration and leasing.

Exploration would be allowed on the 3,328,800 acres of federal mineral estate within PHMA but would be subject to TL stipulations and other restrictions. Most notably, exploration would be allowed only for gathering information about nonenergy leasable mineral resources outside PHMA (e.g., structure of the area). Because of these limitations and the fact that PHMA would be closed to new prospecting and exploration and leasing, exploration in PHMA would decrease under this alternative. Decreases in exploration in PHMA could reduce the availability of data on nonenergy leasable mineral resources and could increase costs of nonenergy leasable mineral development if the limitations required use of more expensive exploration technology (such as helicopter portable drilling). TL stipulations on exploration would delay development activities

Table 4.37
Nonenergy Leasable Minerals, Alternative B

Mineral Potential and Occurrence	Closed to All New Leasing (acres)	Closed to New Surface Mining/ Open to New Underground Mining (acres)[1]	Open to All Mining (acres)
Gilsonite Potential	**0**	**N/A**	**74,000**
High	0	N/A	12,400
Moderate	0	N/A	54,800
Low	0	N/A	6,800
Phosphate Potential	**185,900**	**N/A**	**25,700**
High	42,700	N/A	0
Moderate	18,700	N/A	700
Low	124,500	N/A	25,100
Sodium Occurrence	**158,900**	**N/A**	**2,800**

Source: BLM 2012d
[1] Underground mining includes surface-disturbing activities such as exploration, structures, roads, shafts, and power lines.

and could cause equipment shortages because all exploration would be occurring during the same time period.

Existing federal nonenergy leasable mineral leases in the 3,328,800 acres of federal mineral estate in PHMA would be subject to RDFs, which would limit surface disturbance, vehicle use, siting, and design of mineral development operations, in addition to imposing reclamation requirements. Application of RDFs would increase costs of nonenergy leasable development if it delayed resource development or resulted in the use of more expensive technology or less efficient development than would otherwise have been used. If costs increased to the extent that it was no longer economical to develop the resources, nonenergy leasable development on federal mineral estate could be reduced.

Gilsonite. Like Alternative A, under Alternative B, all federal mineral estate with gilsonite potential in the decision area would be open to nonenergy leasable mineral prospecting and exploration and leasing. The 2,700 acres of authorized gilsonite leases in mapped occupied habitat would lie within GHMA and would be subject to any surface-disturbance limitations and/or BMPs included in those leases. Impacts of these BMPs would be the same type as described under Alternative A.

Phosphate. Under Alternative B, 185,900 acres (88 percent) of federal mineral estate in the decision area with phosphate potential would be closed to new nonenergy leasable mineral prospecting and exploration and leasing. This closure would include the 42,700 acres of federal mineral estate with high phosphate potential in the decision area, all of which are within the Uintah Population Area. The impacts of closing these areas to leasing would be the same type as described under Alternative A. The remaining 25,700 acres (12 percent) of federal mineral estate with phosphate potential in the decision area would be open to nonenergy leasable mineral prospecting and exploration and leasing.

The 9,100 acres of authorized and pending phosphate leases in the decision area would lie within PHMA under this alternative and would be subject to RDFs. The RDFs and the nature of their impacts are described under the section for all nonenergy leasables under Alternative B.

Sodium. Under Alternative B, approximately 158,900 acres (98 percent) of federal mineral estate with sodium occurrence in the decision area (all in PHMA) would be closed to new nonenergy leasable mineral prospecting, exploration, and leasing. These closures would affect the Rich Population Area, which contains 98 percent of the sodium occurrence on federal mineral estate in the decision area. The remaining 2,800 acres (2 percent) of federal mineral estate with sodium occurrence in the decision area, all in the Box Elder Population Area, would be open to nonenergy leasable mineral prospecting and exploration and leasing. There are no federal sodium leases in the decision area; therefore, no existing sodium leases would be impacted by RDFs.

Alternative C

Management actions for mineral programs other than fluid minerals and nonenergy leasables would not impact nonenergy leasables. Therefore, only the impacts from fluid minerals and nonenergy leasables management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative C, all federal mineral estate in the decision area would be closed to new fluid mineral leasing. The types of impacts on gilsonite demand from these management actions would be the same as those described under Alternative A, but the magnitude would increase due to the increase in acres closed. However, because all federal mineral estate in the decision area would be closed to new gilsonite development under this alternative, development of gilsonite in the decision area would not be impacted by fluid minerals management actions.

Nonenergy Leasables

Under Alternative C, all federal mineral estate in the federal mineral estate decision area (4,008,600 acres) would be closed to new prospecting and exploration and leasing. Management under this alternative would close 29 times more federal mineral estate to nonenergy leasable mineral prospecting and exploration and leasing than management under Alternative A. This allocation decision would impact gilsonite, phosphate, and sodium, for which the individual analyses are provided below. New leases to expand existing mines for these minerals also would not be permitted. Closing areas to nonenergy mineral leasing would result in the same type of impacts as those described under Alternative A.

Table 4.38 breaks down the acres within the decision area by whether they would be open or closed to new nonenergy leasable mineral prospecting and exploration and leasing.

Under Alternative C, exploration would be prohibited on all 4,008,600 acres of federal mineral estate within the decision area. Closing the decision area to exploration could reduce the availability of data on nonenergy leasable mineral resources outside the decision area and could increase costs of nonenergy leasable mineral development if it resulted in the need to conduct exploration for resources outside the decision area via less easily accessible locations than the locations within the decision area from which exploration might otherwise occur. Operators with existing leases would still be able to conduct new exploration on those leases.

Table 4.38
Nonenergy Leasable Minerals, Alternative C

Mineral Potential and Occurrence	Closed to All New Leasing (acres)	Closed to New Surface Mining/ Open to New Underground Mining (acres)[1]	Open to All Mining (acres)
Gilsonite Potential	**74,000**	**N/A**	**19,700**
High	12,400	N/A	1,700
Moderate	54,800	N/A	17,500
Low	6,800	N/A	500
Phosphate Potential	**211,700**	**N/A**	**0**
High	42,700	N/A	0
Moderate	19,300	N/A	0
Low	149,600	N/A	0
Sodium Occurrence	**161,700**	**N/A**	**0**

Source: BLM 2012d
[1] Underground mining includes surface-disturbing activities such as exploration, structures, roads, shafts, and power lines.

Existing nonenergy leasable mineral leases in the 4,008,600 acres of federal mineral estate in PHMA (the entire decision area) would be subject to the same RDFs described under Alternative B, with the same type of impacts.

Gilsonite. Under Alternative C, approximately 74,000 acres (79 percent) of federal mineral estate with gilsonite potential in the decision area would be closed to new nonenergy leasable mineral prospecting and exploration and leasing. This closure would include 12,400 acres (88 percent) of federal mineral estate with high gilsonite potential in the decision area. The majority of the acres with gilsonite potential in the decision area would be closed to new prospecting, exploration, and leasing under Alternative C, which would greatly decrease extraction of gilsonite from federal mineral estate in the decision area compared with Alternative A. The remaining 19,700 acres (21 percent) of federal mineral estate with gilsonite potential in the decision area would be open to nonenergy leasable mineral prospecting and exploration and leasing. The 2,700 acres of authorized gilsonite leases in mapped occupied habitat would be within PHMA and would be subject to RDFs. The RDFs and the nature of their impacts are described under Alternative B.

Phosphate. Under Alternative C, all federal mineral estate in the decision area with phosphate potential would be closed to new nonenergy leasable mineral prospecting and exploration and leasing. The impacts of closing these areas to leasing would be the same type as those described under Alternative A; however, because all acres with phosphate potential in the decision area would be closed to new prospecting and exploration and leasing under Alternative C, the magnitude of the impacts would increase from Alternative A. Management of the 9,100 acres of authorized and pending phosphate leases in PHMA would be the same as under Alternative B.

Sodium. Under Alternative C, all federal mineral estate with sodium occurrence in the decision area (all in PHMA) would be closed to new nonenergy leasable mineral prospecting and exploration and leasing. The types of impacts would be as described under Alternative B;

however, because more acres would be closed under Alternative C, the impacts would be greater. There are no federal sodium leases in the decision area. Therefore, no existing sodium leases would be impacted by RDFs.

Alternative D

Management actions for mineral programs other than fluid minerals and nonenergy leasables would not impact nonenergy leasables. Therefore, only the impacts from fluid minerals and nonenergy leasables management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative D, the same acreage would be closed to new fluid mineral leasing as that under Alternative A. Another 1,853,100 acres (46 percent) of federal mineral estate would be subject to NSO stipulations. The types of impacts on gilsonite demand from these management actions would be the same as those described under Alternative A; however, because more acres would be subject to NSO stipulations under Alternative D, the magnitude of those impacts would increase.

Nonenergy Leasables

Like Alternative A, under Alternative D, 138,500 acres (3 percent) of federal mineral estate in the decision area would be closed to new nonenergy leasable mineral prospecting and exploration and leasing. Another 2,905,100 acres (73 percent) of federal mineral estate within PHMA and within 1 mile of leks in GHMA would be closed to new leasing for development by surface mining but would be open to leasing for development by underground mining. These allocation decisions would impact gilsonite, phosphate, and sodium, for which the individual analyses are provided below. Approximately 965,000 acres (24 percent) of federal mineral estate in the decision area would be open to leasing consideration for both surface and underground mining. Closing areas to nonenergy leasable mineral prospecting and exploration and leasing would result in the same type of impacts as those described under Alternative A.

Closing areas to nonenergy mineral leasing for development by surface mining could increase costs of development by requiring developers to use more expensive or less-efficient underground mining methods or waste mineral resources if underground mining is not feasible. While some surface disturbance associated with underground mining would be allowed, the allowable disturbance would be minimal compared to that from surface mining. If these closures to surface mining precluded development of nonenergy leasable mineral resources, developers could move to nearby private or state minerals. However, state, county, and private mineral resources are often fragmented and limited in extent. Precluding development of nonenergy leasable minerals would also result in loss of bonus bids and royalty revenues to the federal and state governments (see **Section 4.23**). Impacts of closing areas to surface mining in GHMA within 1 mile of leks would be mitigated where developers completed off-site mitigation in exchange for waiver of the closure. While off-site mitigation would mitigate the impacts of closure and be the most cost-effective option for developers, it would still increase costs of development compared with Alternative A.

Table 4.39 breaks down the acres within the decision area by whether they would be open or closed to new nonenergy mineral prospecting and exploration and leasing.

Table 4.39
Nonenergy Leasable Minerals, Alternative D

Mineral Potential and Occurrence	Closed to All New Leasing (acres)	Closed to New Surface Mining/ Open to New Underground Mining (acres)[1]	Open to All Mining (acres)
Gilsonite Potential	**0**	**0**	**74,000**
High	0	0	12,400
Moderate	0	0	54,800
Low	0	0	6,800
Phosphate Potential	**34,700**	**151,200**	**25,700**
High	9,700	33,100	0
Moderate	0	18,700	700
Low	25,000	99,500	25,100
Sodium Occurrence	**24,300**	**137,500**	**0**

Source: BLM 2012d
[1] Underground mining includes surface-disturbing activities such as exploration, structures, roads, shafts, and power lines.

In addition to the allocations described above, new or modified leases for underground mining in PHMA would be required to avoid placement of appurtenant facilities in PHMA or, if avoidance was not technically feasible, facilities placed in PHMA would be subject to limitations on siting, noise, tall structures, and timing, in addition to mitigation requirements. Under no circumstances could new appurtenant facilities be placed within 1 mile of a lek in PHMA. Impacts of these limitations and mitigation requirements would be the same type as those described for RDFs under Alternative B.

Nonenergy leasable mineral development and maintenance activities would be prohibited in breeding and nesting, brood-rearing, and winter habitats during certain times of year in both PHMA and GHMA. In areas containing all three of these habitats, these restrictions could overlap such that nonenergy leasable mineral development activities would only be permitted in those areas from July 15 to November 15. Limiting nonenergy leasable mineral development activities to 4 months of the year could essentially close an area to nonenergy leasable mineral development.

New leases for underground mining in GHMA would be required to minimize surface disturbance and disruption as needed to protect GRSG. Costs of development could increase under this alternative if developers were required to use more expensive technology than they might otherwise have used in order to minimize surface disturbance. These costs may be prohibitive, and the mineral may not be able to be extracted.

These leases could be subject to the limitations described above for PHMA on a case-by-case basis. If the limitations were applied to leases, impacts would be the same type as those described for RDFs under Alternative B. Impacts would be mitigated where developers performed off-site mitigation in exchange for waiver of limitations in GHMA.

While new leases for surface mining could not be issued within PHMA, prospecting and exploration would still be allowed on the surface to gather information on the viability of underground mining. However, existing and future prospecting and exploration operations within PHMA would be subject to additional limitations on siting of facilities and timing of activities. In addition, cumulative surface disturbance associated with prospecting and exploration within PHMA in a population area could not exceed 5 percent. Impacts of these limitations would be similar to the impacts of RDFs described under Alternative B. However, because management under Alternative D would apply limitations and stipulations to nonenergy leasable prospecting and exploration instead of closing additional areas to prospecting and exploration, these siting limitations and TL stipulations would be applied to more acres. The magnitude of impacts from siting limitations and TL stipulations would increase, but the overall impact of management applicable to prospecting and exploration would decrease.

Limitations on noise and tall structures would also apply to areas outside occupied habitat but within 4 miles of an occupied lek within PHMA. Impacts of these limitations would be the same type as those described for RDFs under Alternative B.

Exploration would be allowed in the decision area under Alternative D, but seasonal restrictions would apply in nesting, brood-rearing, and winter habitat. While these restrictions would continue to apply to exploration in some areas under Alternative A, more consistent application under Alternative D would increase impacts on nonenergy leasable minerals due to a potential decrease in exploration compared with Alternative A. Impacts of this decrease would be the same type as those described under Alternative B.

Existing nonenergy leasable mineral leases on the 3,283,900 acres of federal mineral estate in PHMA would be subject to the same RDFs described under Alternative B. Exceptions would occur where a design feature was not applicable (e.g., a resource is not present on a given site) or where the design feature would not actually provide additional protection for GRSG or its habitat. See **Table 2.4** for more information on when these exceptions to RDFs would apply.

Gilsonite. Like Alternative A, under Alternative D, all federal mineral estate with gilsonite potential in the decision area would be within GHMA and would be open to nonenergy leasable mineral prospecting and exploration and leasing. However, all federal gilsonite leases within 1 mile of a lek would be subject to no surface disturbance stipulations. The impacts of these stipulations would be the same type as the impacts of closing an area to surface mining described above for all nonenergy leasables under Alternative D. The 2,700 acres of authorized gilsonite leases in mapped occupied habitat would lie within GHMA and would be subject to any surface-disturbance limitations and/or BMPs included in those leases. Impacts of these BMPs would be the same type as those described under Alternative A. Any of these leases that are within 4 miles of a lek lying within PHMA would be subject to limitations on noise and tall structures if the lease were modified.

Phosphate. Under Alternative D, 34,700 acres (16 percent) of federal mineral estate with phosphate potential in the decision area would be closed to new nonenergy leasable mineral prospecting and exploration and leasing, including 9,700 acres of federal mineral estate with high phosphate potential in the decision area. The impacts of closing these areas to leasing would be the same type as those described under Alternative A, but to a greater extent. Another 151,200

acres (71 percent) of federal mineral estate with phosphate potential would be open to leasing for development by underground mining only, including 33,077 acres (78 percent) of federal mineral estate with high phosphate potential in the decision area. Impacts of closures to surface mining would be the same type as those described under *Utah Sub-region (Total Decision Area)*, above. The remaining 25,700 acres (12 percent) of federal mineral estate with phosphate potential in the decision area would be open to nonenergy mineral leasing for development by both surface and underground mining. Management of the 9,100 acres of authorized and pending phosphate leases in PHMA would be similar to Alternative B, except that RDFs would not be required where exceptions applied.

Sodium. Like Alternative C, under Alternative D, none of the federal mineral estate with sodium occurrence in the decision area would be open to nonenergy leasable mineral prospecting and exploration and leasing. However, 137,500 acres (85 percent) of federal mineral estate with sodium occurrence in the decision area would be open to leasing for development by underground mining only. The remaining 24,300 acres (15 percent) of federal mineral estate with sodium occurrence in the decision area would be closed to nonenergy mineral leasing for development by both surface and underground mining. There are no federal sodium leases in the decision area. Therefore, no existing sodium leases would be impacted by RDFs.

Alternative E

Management actions for mineral programs other than fluid minerals and nonenergy leasables would not impact nonenergy leasables. Therefore, only the impacts from fluid minerals and nonenergy leasables management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative E, the same acreage would be closed to new fluid mineral leasing as under Alternative A. Another 690,100 acres (17 percent) of federal mineral estate would be subject to NSO stipulations. The types of impacts on gilsonite demand from these management actions would be the same as those described under Alternative A; however, because more acres would be subject to NSO stipulations under Alternative E, the magnitude of those impacts would increase.

Nonenergy Leasables

Nonenergy leasable mineral allocations under Alternative E would be the same as those under Alternative A (refer to **Table 4.36**). These allocation decisions would impact gilsonite, phosphate, and sodium, for which the individual analyses are provided below.

New leases in mapped GRSG habitat in SGMAs/core areas, including leases for commercial prospecting and exploration, would be subject to limitations on siting, disturbance (including a 5 percent disturbance cap), tall structures, noise, and timing of development activities. Impacts of these limitations would be the same type as those described for RDFs under Alternative B. Mitigation may also be required.

CSU and TL stipulations would apply to exploration within PHMA, potentially causing a decrease in exploration from Alternative A. Impacts of this decrease in exploration would be the same type as those described under Alternative B.

Management of existing leases in PHMA would be the same as under Alternative A.

Management of nonenergy leasable minerals in mapped GRSG habitat outside SGMAs/noncore areas would be the same as under Alternative A.

Gilsonite. Like Alternative A, under Alternative E, all federal mineral estate with gilsonite potential in the decision area would be open to nonenergy leasable mineral prospecting and exploration and leasing. However, the limitations on siting, disturbance, tall structures, noise, and timing of development activities described above would apply. This would increase impacts compared with Alternative A. The 2,700 acres of authorized gilsonite leases in the decision area would lie within mapped GRSG habitat outside SGMAs/noncore areas and would be subject to the same management as under Alternative A.

Phosphate. Like Alternative A, under Alternative E, 4,090 acres of federal mineral estate with low phosphate potential in the decision area would remain closed to new nonenergy leasable mineral prospecting and exploration and leasing. The impacts of closing these areas to leasing would be the same type as those described under Alternative A. All other acres with phosphate potential in the decision area would be open to nonenergy leasable mineral prospecting and exploration and leasing. The 9,100 acres of authorized and pending phosphate leases in the decision area would be subject to the same management as under Alternative A.

Sodium. Like Alternative A, under Alternative E, the 175,200 acres of federal mineral estate with sodium occurrence in the decision area would remain open to nonenergy leasable mineral prospecting and exploration and leasing. There are no federal sodium leases in the decision area. Therefore, no existing sodium leases would be impacted by BMPs.

Proposed Plans

Special Status Species – GRSG

Application of the 3 percent disturbance cap (5 percent on National Forest System lands in Wyoming) in PHMA and lek buffers in PHMA and GHMA could impact both new and existing nonenergy leasable minerals activities by preventing or restricting new surface development. New nonenergy leasable minerals activities could be precluded if the cap were exceeded in a BSU or a proposed project analysis area. New surface development on existing leases could be restricted if the cap were exceeded. However, the BLM would not apply the disturbance cap in a manner that would eliminate all reasonable opportunities to develop an existing lease. Currently there are no population areas where the density of disturbance exceeds the 3 percent cap. However, there are areas within 4 miles of a lek in population areas that are near or exceeding the disturbance cap, including in the Uintah Population Area where there is high occurrence and existing development of phosphate.

Applying lek buffer distances when approving actions for linear features, infrastructure related to energy development, surface disturbance, and noise could also restrict development of nonenergy leasable minerals.

RDFs would be applied as under the action alternatives in PHMA and GHMA and impacts would be similar in nature and magnitude as Alternative D. In addition to the RDFs, disturbance cap,

lek buffers, and density restrictions, additional conservation measures in PHMA would include net conservation gain requirements (also a requirement in GHMA), restrictions on noise, and seasonal restrictions. All of these combined would further restrict nonenergy leasable minerals development compared with Alternative A. Based on the disturbance cap and these other restrictions, it is unlikely that the existing phosphate and gilsonite mines could expand or that new phosphate or gilsonite mines would be approved on federal mineral estate in the decision area.

Occurrence of sodium is limited to the Rich and Box Elder Population Areas where the total disturbance and disturbance within 4 miles of leks is lower and there are no existing leases. However, all sodium occurrence in the decision area is in PHMA and, under the Proposed Plans, PHMA would be closed to new nonenergy minerals leases. However, the occurrence of sodium is largely present outside of population areas, though, so the overall impact on sodium development in the Utah Sub-region would be minimal.

Mineral Development

Management actions for mineral programs other than fluid minerals and nonenergy leasables would not impact nonenergy leasables. Therefore, only the impacts from fluid minerals and nonenergy leasables management actions are discussed in the paragraphs below.

Fluid Minerals

Under the Proposed Plans, the number of acres closed to all new fluid mineral leasing would be the same as under Alternative A. Another 3,258,300 acres (79 percent) of federal mineral estate would be subject to NSO stipulations. The types of impacts on gilsonite demand from these management actions would be the same as those described under Alternative A; however, because more acres would be subject to NSO stipulations under the Proposed Plans, the magnitude of those impacts would increase.

Nonenergy Leasables

Under the Proposed Plans, PHMA would be closed to nonenergy mineral leasing (3,310,600 acres of federal mineral estate). An additional 59,400 acres of federal mineral estate in GHMA would be closed to nonenergy mineral leasing. These allocation decisions would impact gilsonite, phosphate, and sodium, for which the individual analyses are provided below. Closing areas to nonenergy mineral leasing would result in the same type of impacts as those described under Alternative A. However, the magnitude of these impacts would increase because more acres would be closed. Impacts of this closure would be mitigated because new leases adjacent to existing operations would be allowed, but these new leases would be subject to the restrictive management described under *Special Status Species – GRSG*.

Approximately 673,600 acres (16 percent) of federal mineral estate in the decision area would be open to leasing consideration for both surface and underground mining, all of which would be in GHMA. In GHMA, development would be subject to mitigation and lek buffers. Impacts of which are discussed under *Special Status Species – GRSG*.

Table 4.40 breaks down the acres within the decision area by whether they would be open or closed to new nonenergy mineral leasing.

Table 4.40
Nonenergy Leasable Minerals, Proposed Plans

Mineral Potential and Occurrence	Closed to All New Leasing (acres)	Open to All Mining (acres)
Gilsonite Potential	0	**74,000**
High	0	12,400
Moderate	0	54,800
Low	0	6,800
Phosphate Potential	**186,700**	**24,300**
High	42,700	0
Moderate	19,100	700
Low	124,900	23,600
Sodium Occurrence	**161,700**	**0**

Source: BLM 2015

Gilsonite. Like Alternative A, under the Proposed Plans, all federal mineral estate with gilsonite potential in the decision area would be within GHMA and would be open to nonenergy leasable mineral leasing. However, new leases in GHMA would be subject to mitigation and lek buffers. Impacts of which are discussed under *Special Status Species – GRSG*. The 2,700 acres of authorized gilsonite leases in mapped occupied habitat would lie within GHMA and would be subject to current lease-specific surface disturbance limitations and/or BMPs included in those leases or approved plans governing the leases. Impacts of these BMPs would be the same type as those described under Alternative A.

Phosphate. Under the Proposed Plans, 186,700 acres (88 percent) of federal mineral estate with phosphate potential in the decision area (including all federal mineral estate in PHMA) would be closed to new nonenergy leasable mineral prospecting and exploration and leasing, including all of federal mineral estate with high phosphate potential in the decision area (42,700 acres). The impacts of closing these areas to leasing would be the same type as those described under Alternative B. Impacts of this closure would be mitigated because new leases adjacent to existing operations would be allowed, but these new leases would be subject to the restrictive management described under *Special Status Species – GRSG*. This management would likely preclude new surface development associated with new and existing phosphate leases, including new surface development of the prospecting permit applications, expression of interest, and fringe acreage lease application on federal mineral estate in the decision area.

The mineral potential report for the Vernal RMP identifies continued development of phosphate on nonfederal mineral estate during the period of analysis (through 2017). It does not anticipate any development on federal mineral estate during the period of analysis. However, since completion of that report, the phosphate mine in PHMA has changed ownership. Given current mineral holdings on private lands, it is anticipated that mining operations will be able to continue on private lands for the extent of this analysis window (15 years). However, as the current mine on private lands expands, it is foreseeable that existing mining operations would progress to the edge of the nonfederal mineral estate. Then, because development of federal mineral estate would likely not be consistent with the disturbance cap, the mine would have to be redirected to other areas with nonfederal minerals or change mining methods (e.g., underground mining).

These changes would increase the cost of phosphate mining or, if the cost were deemed too high by the developer, potentially result in phosphate ore being left in place on federal mineral estate. Depending on the size of the federal minerals tract, this could result in either a loss (temporary lack of mining) or waste (permanent lack of mining if the remaining federal mineral resource is not economical to return to develop later) of federal mineral resources. This is because the mine on private lands would be reclaimed, then, if at some future date the federal minerals are available for mining, the minerals on the federal tract would generally not be economical to return to mine. While mining operations would be able to continue, there would be an increase in costs to the mine to use underground mining, move operations around the federal tracts, or redirect to other portions of the private lands.

In addition, there are seven existing Prospecting Permit Applications, one Expression of Interest, and two Fringe Acreage Lease Applications. The management restrictions for the Proposed Plans described above would apply to any new projects on federal mineral estate in PHMA. As described above, this management would likely preclude new surface development associated with these actions. If the actions were rendered noneconomical because of these surface disturbance restrictions, they might not occur at all. As a result, development of nonenergy solid leasables in the decision area could be reduced.

The remaining 24,300 acres (12 percent) of federal mineral estate with phosphate potential (all moderate and low potential) in the decision area would be in GHMA and open to nonenergy mineral leasing. However, the restrictions to protect GRSG and their habitat described under *Special Status Species – GRSG* could limit new surface development associated with new nonenergy minerals leasing. Areas where development occurred would require increased costs associated with mitigation necessary to meet a net conservation gain for GRSG habitat.

Sodium. Like Alternative C, under the Proposed Plans, none of the federal mineral estate with sodium occurrence in the decision area would be open to nonenergy leasable mineral leasing.

4.21.3 Coal

Methods and Assumptions

Indicators
Indicators of impacts on coal are as follows:

- The amount of land surface identified as unacceptable for any coal leasing consideration
- The amount of land surface identified as unsuitable for surface coal mining
- Application of siting, surface disturbance, and TL stipulations on both surface and underground coal mining
- Application of surface-disturbance limitations and TL stipulations and reclamation requirements for coal exploration

Where information is available, consideration is given to the potential for coal resources on lands identified as unacceptable for leasing. For example, an indicator of an impact on coal is if

there were substantial reductions in federal leasing and development of coal resources in high potential areas.

Assumptions

The analysis includes the following assumptions:

- If an area is leased, it could be developed. Not all leases would be developed within the life of this LUPA; however, pursuant to 43 CFR 3483, coal leases may be terminated if they are not diligently developed.
- Coal operations on existing federal leases, regardless of surface ownership, could be subject to restrictions on surface disturbance. Under these circumstances, existing leases would be developed consistent with applicable laws and valid existing rights, using as many of the restrictions and conservation measures as possible while still allowing reasonable access.
- As the demand for energy increases worldwide, so will the demand for extracting energy resources in areas with potential.
- In accordance with 43 CFR 3461.5, all National Forest System lands in the decision area are unsuitable for surface mining with the exception that surface operations and impacts that are incident to an underground coal mine may be allowed.
- Management actions to protect GRSG apply to coal leasing on all surface lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered and National Forest System surface and underlying non-BLM-administered or non-National Forest System surface. There are 4,008,600 acres of federal mineral estate within the decision area (3,313,800 acres of BLM-administered and National Forest System surface with federal minerals and 694,800 acres of non-BLM-administered and non-National Forest System surface with federal minerals).
- As discussed in the Minerals section of **Chapter 3**, much of the coal in central Utah has already been extracted, and the remaining coal in this area is generally more difficult to access or extract and some is of lower quality. As the coal reserves in central Utah are depleted, mining could expand to other coal fields in Utah, including additional mining in southern Utah including the Alton Coal Field. All mining in the decision area is currently underground, though there is one surface mine in on private lands in the Panguitch Population Area. While there is little potential for surface mining in most of the decision area, there are federal lands adjacent to the exiting surface mine within the Panguitch Population Area where environmental studies are ongoing considering a lease-by-application for surface coal mining.

Implementing management for the following resources to protect GRSG would have negligible or no impact on coal and are therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, Lands and Realty, and ACECs.

Alternative A

Management actions for mineral programs other than coal would generally not impact coal. Therefore, only the impacts from coal management actions are discussed in the paragraphs below.

Utah Sub-region (Total Decision Area)

Under Alternative A, 22,900 acres of federal mineral estate with coal occurrence in the decision area (1 percent of the federal mineral estate decision area) are within WSAs and the Grand Staircase Escalante National Monument, administered by the BLM, and would remain unacceptable for coal leasing consideration. The strategic or nonstrategic nature of the lands for mine access or production on adjacent lands has not been assessed. Although no RMP decision has specified that these areas are unacceptable, they are required to be managed as such by the BLM Manual 6330, Management of Wilderness Study Areas, and the presidential proclamation establishing the Grand Staircase Escalante National Monument (Proclamation No. 6920).

All other acres in the decision area (3,982,800 acres, or 99 percent of the decision area) are acceptable for further consideration for leasing. However, 271,300 acres (7 percent) of federal mineral estate beneath National Forest System land in the decision area is unsuitable for surface mining with the exception of surface operations incident to underground mines. Management of areas as unsuitable for surface mining precludes development of some near-surface coal resources. The inability to have surface access on portions of leases could also effectively permanently preclude development of underground coal resources. Where possible depending on coal resources and geology, coal operations could relocate to nearby state, county, or private minerals. However, state, county, and private mineral resources are often fragmented and limited in extent. Additionally, blocks of coal could become isolated and therefore uneconomical to mine in the future.

The remaining 3,711,500 acres (93 percent) of federal mineral estate in the decision area is suitable for surface mining. **Table 4.41** breaks down the acres suitable or unsuitable for surface mining by coal development potential (high, moderate, or low). The Alton mine (located on private minerals in the Panguitch Population Area) is the only surface coal mining operation in the planning area at this time. All other coal operations in the planning area are underground mines.

Additional areas may be determined to be unsuitable for surface mining after site-specific review associated with coal lease applications if these areas were found to contain GRSG habitat that is of high interest to the state and is essential to maintaining the species.

Continuing to apply disturbance buffers and seasonal TL stipulations on surface-disturbing and disruptive activities in portions of GRSG breeding, nesting, and winter habitat would directly impact development of coal resources by limiting the siting, design, timing, and operations of coal-development projects. This, in turn, could delay resource development and require operators to use more costly development methods than they otherwise might have used.

The 30,300 acres of authorized and pending coal leases on federal mineral estate in mapped occupied habitat would continue to exist subject to the terms and conditions included in those leases.

Table 4.41
Coal Leasing Categories in the Decision Area, Alternative A, D, and E, and Proposed Plans

Coal Development Potential	Unsuitable for Surface Mining	Suitable for Surface Mining
Total Decision Area		
High	98,400	87,100
Moderate	90,000	156,600
Low	82,900	620,500
Total (All Potentials)[1]	**271,300**	**864,200**
Carbon Population Area		
High	640	13,460
Moderate	5,120	8,780
Low	43,700	81,200
Total (All Potentials)[1]	**49,400**	**103,440**
Emery Population Area		
High	66,400	100
Moderate	5,300	0
Low	0	0
Total (All Potentials)[1]	**71,700**	**100**
Panguitch Population Area		
High	0	4,000
Moderate	1,800	200
Low	0	0
Total (All Potentials)[1]	**1,800**	**4,200**

Source: BLM 2012d, 2015
[1]Does not include management of acres with no coal development potential.

Carbon Population Area

Under Alternative A, some federal mineral estate with coal occurrence in the population area would remain unacceptable for coal leasing consideration because it is within a WSA. Coal leasing and development would continue to be prohibited in these areas; therefore, the coal resources in these areas would remain inaccessible. Approximately 640 acres (5 percent) of federal mineral estate with high development potential in the population area would remain unsuitable for surface mining because it would lie beneath National Forest System surface. The remaining federal mineral estate with coal development potential in the population area would remain suitable for surface mining. Four new coal mines in the Carbon Population Area are projected to be potentially developed under this alternative.

Emery Population Area

Under Alternative A, 66,400 acres (over 99 percent) of federal mineral estate with high development potential and all federal mineral estate with moderate potential in the Emery Population Area would remain unacceptable for surface mining because it would lie beneath National Forest System surface. Two new coal operations in the Emery Population Area are projected to be potentially developed under this alternative.

Panguitch Population Area

Under Alternative A, all federal mineral estate with high development potential within the Panguitch Population Area would remain suitable for surface mining. However, approximately 1,800 acres (90 percent) of federal mineral estate with moderate development potential in the population area would lie beneath National Forest System surface and would remain unsuitable for surface mining. At least two new coal mines in the Panguitch Population Area are projected to be potentially developed under this alternative.

Alternative B

Management actions for mineral programs other than coal would generally not impact coal. Therefore, only the impacts from coal management actions are discussed in the paragraphs below.

Utah Sub-region (Total Decision Area)

Management of the 22,900 acres with coal occurrence in the decision area within WSAs and the Grand Staircase Escalante National Monument would be the same as described under Alternative A. The strategic or nonstrategic nature of the lands for mine access or production on adjacent lands has not been assessed. No additional areas would be unacceptable for consideration for coal leasing under this alternative.

Under Alternative B, 3,328,800 acres (83 percent of the decision area), including all federal mineral estate in PHMA, would be managed as unsuitable for surface mining. This closure to surface mining would include 167,700 acres with high coal development potential (30 percent of federal mineral estate with high coal potential in the decision area). **Table 4.42** breaks down the acres within the decision area by whether they would be suitable or unsuitable for surface mining.

Approximately 710,500 acres (62 percent) of federal mineral estate with coal development potential in the decision area would be unsuitable for surface mining under this alternative. However, all existing federal leases in the decision area are available for underground mining. The Alton coal mine on private minerals in the Panguitch Population Area is the only surface mine in the planning area at this time.

New leases for underground mining would require all surface disturbances to be placed outside the 3,328,760 acres of BLM-administered and National Forest System surface and split-estate in PHMA. This requirement would increase costs of coal production by limiting siting options and increasing transport distances within the lease. Miner safety could also be a significant issue if, for example, escape ways and ventilation are limited. Due to these miner safety issues, some underground coal mines could not expand or be developed. The term of existing coal mines could be shortened, and some coal resources could be unrecoverable. Additionally, coal operations could relocate to nearby state, county, or private minerals to avoid these constraints. However, state, county, and private mineral resources are often fragmented and limited in extent.

Table 4.42
Coal Leasing Categories in the Decision Area, Alternative B

Coal Development Potential	Unsuitable for Surface Mining	Suitable for Surface Mining
Total Decision Area		
High	167,700	17,800
Moderate	241,200	5,400
Low	301,600	402,200
Total (All Potentials)[1]	**710,500**	**425,400**
Carbon Population Area		
High	59,400	15,100
Moderate	62,200	0
Low	105,400	42,200
Total (All Potentials)[1]	**227,000**	**57,300**
Emery Population Area		
High	66,400	3,600
Moderate	5,300	1,400
Low	0	0
Total (All Potentials)[1]	**71,700**	**5,000**
Panguitch Population Area		
High	0	5,300
Moderate	1,800	15,300
Low	0	0
Total (All Potentials)[1]	**1,800**	**0**

Source: BLM 2012d
[1]Does not include management of acres with no coal development potential.

Exploration would be allowed on the 3,328,800 acres of federal mineral estate within PHMA but would be subject to TL stipulations and other restrictions. Most notably, exploration would be allowed only for gathering information about coal resources outside PHMA (e.g., evaluating structure of the area). Because of these limitations, exploration in PHMA would decrease under this alternative. Decreases in exploration in PHMA could reduce the availability of data on coal resources and would increase costs of coal development if the limitations required use of more expensive exploration technology (such as helicopter portable drilling). TL stipulations on exploration would delay development activities and could cause equipment shortages because all exploration would be occurring during the same time period.

The 24,800 acres of authorized and pending coal leases in PHMA would be required to place any new appurtenant facilities outside of PHMA under this alternative. Impacts of this siting limitation would be the same type as those described in the paragraph above. The 5,500 acres of authorized and pending coal leases in GHMA under this alternative could be required to minimize surface-disturbing and disrupting activities on a case-by-case basis.

Carbon Population Area

Like Alternative A, some federal mineral estate with coal occurrence in the population area would remain unacceptable for coal leasing consideration because it is within a WSA. The remaining federal mineral estate with coal occurrence in the population area would be

acceptable for further consideration for leasing. However, under Alternative B, the BLM and Forest Service would manage PHMA as unsuitable for surface mining.

Table 4.42 breaks down the acres within the population area by whether they would be suitable or unsuitable for surface mining. Under Alternative B, 59,300 acres (80 percent) of federal mineral estate in the Carbon Population Area with high potential would be unsuitable for surface mining. Additionally, 62,200 acres (100 percent) of federal mineral estate in the population area with moderate potential would be unsuitable for surface mining. Impacts of managing these areas as unsuitable for surface mining would be the same type as those discussed above for Alternative B, *Utah Sub-region (Total Decision Area)* if developers wanted to extract coal via surface mining in the population area. However, no surface mines exist in the population area at this time.

New leases for underground mining, as well as existing leases for surface or underground mining, would be required to place new facilities outside PHMA, as described above for Alternative B, *Utah Sub-region (Total Decision Area)*. Impacts of these siting limitations would be the same type as those described above.

Emery Population Area

Table 4.42 breaks down the acres of federal mineral estate within the population area by whether they would be suitable or unsuitable for surface mining. Under Alternative B, 61,200 acres (87 percent) of federal mineral estate in the Emery Population Area with high potential would be unsuitable for surface mining. Another 6,700 acres (100 percent) of federal mineral estate with moderate potential in the population area would be unsuitable for surface mining. Impacts of managing these areas as unsuitable for surface mining would be the same type as those discussed above for the Utah Sub-region under Alternative B if developers wanted to extract coal via surface mining in the population area. However, no surface mines exist in the population area at this time.

New leases for underground mining, as well as existing leases, would be required to place new facilities outside PHMA, as described above for *Utah Sub-region (Total Decision Area)*. Impacts of these siting limitations would be the same type as those described above.

Panguitch Population Area

Table 4.42 breaks down the acres within the population area by whether they would be suitable or unsuitable for surface mining. This breakdown is done by coal development potential (high, moderate, or low potential). Under Alternative B, 4,000 acres (43 percent) of federal mineral estate in the Panguitch Population Area with high potential would be unsuitable for surface mining. Another 2,000 acres (12 percent) of federal mineral estate with moderate potential in the population area would be unsuitable for surface mining. Impacts of this unsuitability determination would be the same type as those described above for Alternative B, *Utah Sub-region (Total Decision Area)*.

The Alton mine would be within PHMA under this alternative; therefore, if the mine operators sought to expand the mine onto federal minerals, they would only be able to do so using underground mining under this alternative.

New leases for underground mining, as well as existing leases, would be required to place new facilities outside PHMA, as described above for *Utah Sub-region (Total Decision Area)*. Impacts of these siting limitations would be the same type as those described above.

Alternative C

Management actions for mineral programs other than coal would generally not impact coal. Therefore, only the impacts from coal management actions are discussed in the paragraphs below.

Utah Sub-region (Total Decision Area)

Management of the 22,900 acres of federal mineral estate with coal occurrence in the decision area within WSAs and the Grand Staircase Escalante National Monument would be the same as described under Alternative A. No additional areas would be unacceptable for consideration for coal leasing under Alternative C. Under Alternative C, 4,008,600 acres of federal mineral estate (100 percent of the decision area) would be managed as unsuitable for surface mining. This closure to surface mining would include 185,500 acres with high development potential (34 percent of high potential federal mineral estate in the decision area). Management of areas as unsuitable for surface mining would have the same type of impacts as those described under Alternative B.

Table 4.43 breaks down the acres within the decision area by whether they would be suitable or unsuitable for surface mining. All federal mineral estate with coal development potential in the decision area would be unsuitable for surface mining under this alternative. However, all existing federal leases in the decision area are for underground mining. The Alton coal mine on private minerals in the Panguitch Population Area is the only surface mine in the planning area.

Restrictions placed on new and existing leases for underground mining would be the same as those under Alternative B. However, under Alternative C, these restrictions would apply to all 4,008,600 acres of federal mineral estate in the decision area (all mapped occupied habitat).

Under Alternative C, exploration for leasable minerals would be prohibited on all 4,008,600 acres of federal mineral estate within the decision area. Closing the decision area to exploration could reduce the availability of data on coal resources outside the decision area and could increase costs of coal development if it resulted in the need to conduct exploration for resources outside the decision area via less easily accessible locations than the locations within the decision area from which exploration might otherwise occur. Because the right to conduct geophysical exploration is part of a lease right, prohibiting exploration in the decision area would not reduce development of coal resources in the decision area, even on existing leases. However, exploration on lands adjacent to existing coal leases would not be possible, restricting the data base for existing and potential adjacent coal mine operations.

Carbon Population Area

Like Alternative A, some federal mineral estate with coal occurrence in the population area would remain unacceptable for coal leasing consideration because it is within a WSA. The remaining federal mineral estate with coal occurrence in the population area would be acceptable for further consideration for leasing.

Table 4.43
Coal Leasing Categories in the Decision Area, Alternative C

Coal Development Potential	Unsuitable for Surface Mining	Suitable for Surface Mining
Total Decision Area		
High	185,500	0
Moderate	246,800	0
Low	703,600	0
Total (All Potentials)[1]	**1,135,900**	**0**
Carbon Population Area		
High	74,500	0
Moderate	62,200	0
Low	147,600	0
Total (All Potentials)[1]	**284,300**	**0**
Emery Population Area		
High	70,000	0
Moderate	6,700	0
Low	0	0
Total (All Potentials)[1]	**76,700**	**0**
Panguitch Population Area		
High	9,300	0
Moderate	17,300	0
Low	0	0
Total (All Potentials)[1]	**26,600**	**0**

Source: BLM 2012d
[1]Does not include management of acres with no coal development potential.

Under Alternative C, the all PHMA would be managed as unsuitable for surface mining.

Under Alternative C, 74,500 acres (100 percent) of federal mineral estate in the Carbon Population Area with high potential would be unsuitable for surface mining. Additionally, 62,200 acres (100 percent) of federal mineral estate in the population area with moderate potential would be unsuitable for surface mining. Impacts of managing these areas as unsuitable for surface mining would be the same type as those discussed under Alternative B, *Utah Sub-Region (Total Decision Area)* if developers wanted to extract coal via surface mining in the population area. However, no surface mines exist in the population area at this time.

Developers of new leases for underground mining, as well as existing leases, would be required to place new facilities outside PHMA, as described for the Utah Sub-Region under Alternative C, above.

Emery Population Area
Under Alternative C, 70,000 acres (100 percent) of federal mineral estate in the Emery Population Area with high potential would be unsuitable for surface mining. Additionally, 6,700 acres (100 percent) of federal mineral estate in the population area with moderate potential would be unsuitable for surface mining. Impacts of managing these areas as unsuitable for surface mining would be the same type as those discussed under Alternative B, *Utah Sub-Region (Total*

Decision Area) if developers wanted to extract coal via surface mining in the population area. However, no surface mines exist in the population area at this time.

Developers of new leases for underground mining, as well as existing leases, would be required to place new facilities outside PHMA, as described for the Utah Sub-region under Alternative C, above.

Panguitch Population Area

Under Alternative C, 9,300 acres (100 percent) of federal mineral estate in the Panguitch Population Area with high potential would be unsuitable for surface mining. Additionally, 17,300 acres (100 percent) of federal mineral estate in the population area with moderate potential would be unsuitable for surface mining. Impacts of managing these areas as unsuitable for surface mining would be the same type as those discussed under Alternative B, *Utah Sub-Region (Total Decision Area)*.

Like Alternative B, under Alternative C, the Alton mine would be within PHMA; therefore, if the mine operators sought to expand the mine onto federal minerals, they would only be able to do so using underground mining under this alternative.

Alternative D

Management actions for mineral programs other than coal would generally not impact coal. Therefore, only the impacts from coal management actions are discussed in the paragraphs below.

Utah Sub-region (Total Decision Area)

Management of the 22,900 acres with coal occurrence in the decision area within WSAs and the Grand Staircase Escalante National Monument would be the same as Alternative A. Like Alternative A, all other acres in the decision area (3,982,800 acres, or 99 percent of the decision area) are acceptable for further consideration for leasing. However, 271,300 acres (7 percent) of federal mineral estate beneath National Forest System land in the decision area would be unsuitable for surface mining with the exception of surface operations incident to underground mines.

New leases for surface mining in PHMA would be subject to limitations on noise, structure height, and timing of activities, as well as mitigation requirements. New disturbance associated with these leases would be subject to the cumulative 5 percent disturbance limit for PHMA within each population area. These limitations would increase costs of coal development and could create development delays due to limits on the timing of activities. Once the 5 percent disturbance limit was reached within PHMA in a certain population area, additional disturbance would not be permitted. As a result, new surface mining could be prohibited in some population areas.

New leases for underground mining in PHMA in addition to the 24,600 acres of authorized and pending underground leases in PHMA would be required to avoid surface disturbance or, if such avoidance is not technically feasible, limit predator perching opportunities, noise, and timing of activities such as construction and vehicle noise. Additional mitigation would also be required. These limitations would increase costs of coal development and could create development

delays due to limits on the timing of activities. Management of authorized and pending leases in PHMA and GHMA would otherwise be the same as Alternative B.

Under Alternative D, exploration activities on 3,283,900 acres of federal mineral estate in PHMA (82 percent of the decision area) would be subject to limitations on surface disturbance and timing of activities. These surface-disturbance limitations and TL stipulations would have the same type of cost and delay impacts as the impacts of limitations on new leases described above under this alternative.

Coal development and maintenance activities would be prohibited in breeding and nesting, brood-rearing, and winter habitats during certain times of year in both PHMA and GHMA. In areas containing all three of these habitats, these restrictions could overlap such that coal development and maintenance activities would only be permitted in those areas from July 15 to November 15. Limiting coal development and maintenance activities to 4 months of the year could essentially close an area to coal development.

New leases for underground mining on 724,300 acres of federal mineral estate in GHMA (18 percent of the decision area) could be subject to disturbance limits and mitigation requirements as needed to protect habitat. Impacts of these requirements would be the same type as those described for similar limitations in PHMA. These impacts would be mitigated where operators conducted off-site mitigation in exchange for waiver of requirements.

Exploration would be allowed in the decision area under Alternative D, but seasonal restrictions would apply in nesting, brood-rearing, and winter habitat. While these restrictions would continue to apply to exploration in some areas under Alternative A, more consistent application under Alternative D would increase impacts on coal due to a potential decrease in exploration compared with Alternative A. Impacts of this decrease would be the same type as those described under Alternative B.

Carbon Population Area

Like Alternative A, some federal mineral estate with coal occurrence in the population area would remain unacceptable for coal leasing consideration because it is within a WSA. Also like Alternative A, approximately 640 acres (5 percent) of federal mineral estate with high development potential in the population area would remain unsuitable for surface mining because it would lie beneath National Forest System surface. The remaining federal mineral estate with coal development potential in the population area would remain suitable for surface mining. Exploration activities and new leases for underground mining in PHMA and GHMA would be subject to the limitations described above for Alternative D, *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Emery Population Area

Like Alternative A, 66,400 acres (over 99 percent) of federal mineral estate with high development potential and all federal mineral estate with moderate potential in the Emery Population Area would remain unacceptable for surface mining because it would lie beneath National Forest System surface. Exploration activities and new leases for underground mining in PHMA and GHMA would be subject to the limitations described above under Alternative D,

Utah Sub-Region (Total Decision Area), thereby increasing impacts on coal compared with Alternative A.

Panguitch Population Area
Like Alternative A, all federal mineral estate with high development potential within the Panguitch Population Area would remain suitable for surface mining. However, approximately 1,800 acres (90 percent) of federal mineral estate with moderate development potential in the population area would lie beneath National Forest System surface and would remain unsuitable for surface mining. Exploration activities and new leases for underground mining in PHMA and GHMA would be subject to the limitations described above for Alternative D, *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Alternative E
Management actions for mineral programs other than coal would generally not impact coal. Therefore, only the impacts from coal management actions are discussed in the paragraphs below.

Utah Sub-region (Total Decision Area)
Management of the 22,900 acres with coal occurrence in the decision area within WSAs and the Grand Staircase Escalante National Monument would be the same as Alternative A. Like Alternative A, all other acres in the decision area (3,982,800 acres, or 99 percent of the decision area) are acceptable for further consideration for leasing. However, 271,300 acres (7 percent) of federal mineral estate beneath National Forest System land in the decision area would be unsuitable for surface mining with the exception of surface operations incident to underground mines.

All new surface and underground leases, as well as exploration activities, on the 3,262,500 acres of federal mineral estate in mapped GRSG habitat in SGMAs/core areas (81 percent of the decision area) would be subject to limitations on siting, disturbance, noise, and timing of activities. Mitigation may also be required. These limitations and requirements would have the same type of impacts as those described under Alternative D.

CSU and TL stipulations would apply to exploration within mapped GRSG habitat in SGMAs/core areas, potentially causing a decrease in exploration from Alternative A. Impacts of this decrease in exploration would be the same type as those described under Alternative B.

Management of authorized and pending leases in mapped GRSG habitat in SGMAs/core areas would be the same as under Alternative A.

Management of coal resources in mapped GRSG habitat outside SGMAs/noncore areas would be the same as under Alternative A.

Carbon Population Area
Like Alternative A, some federal mineral estate with coal occurrence in the population area would remain unacceptable for coal leasing consideration because it is within a WSA. Also like Alternative A, the remaining federal mineral estate with coal occurrence in the population area would be suitable for surface mining.

Exploration activities and new leases for surface and underground mining in mapped GRSG habitat in SGMAs/core areas would be subject to the limitations described above for Alternative E, *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Emery Population Area

Like Alternative A, all federal mineral estate within the Emery Population Area would be suitable for surface mining. Exploration activities and new leases for surface and underground mining in mapped GRSG habitat in SGMAs/core areas would be subject to the limitations described under Alternative E, *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Panguitch Population Area

Like Alternative A, all federal mineral estate within the Panguitch Population Area would be suitable for surface mining. Exploration activities and new leases for surface and underground mining in mapped GRSG habitat in SGMAs/core areas would be subject to the limitations described under Alternative E, *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Proposed Plans

Utah Sub-region (Total Decision Area)

Under the Proposed Plans, all areas with coal potential would remain open for consideration for coal leasing except those areas that are congressionally closed, as under Alternative A. On BLM surface and federal mineral estate, when considering surface mining, the determination of areas as unsuitable for all or certain stipulated methods of coal mining would be made at the time an application for a new coal lease or lease modification is submitted. Development consistent with regulations and with the Proposed Plans could occur. On federal mineral estate in National Forests, 271,300 acres (7 percent) in the decision area would be unsuitable for surface mining with the exception of surface operations incident to underground mines.

Measures to protect GRSG and its habitat (disturbance cap, lek buffers, net conservation gain requirements, and restrictions on noise and season) could affect the feasibility of new underground coal leases or the expansion of existing underground operations (e.g., increased costs and development delays due to limits on the timing of activities) but would not preclude them. As noted in **Chapter 3**, all mining is currently underground except in the Panguitch Population Area. In the Panguitch Population Area where surface mining occurs, the aforementioned measures to protect GRSG and its habitat would affect surface coal production. More specific information is included in the analysis for the Panguitch Population Area below.

Carbon Population Area

Like Alternative A, some federal mineral estate with coal occurrence in the population area would remain unacceptable for coal leasing consideration because it is within a WSA. Also like Alternative A, approximately 640 acres (5 percent) of federal mineral estate with high development potential in the population area would remain unsuitable for surface mining because it would lie beneath National Forest System surface. The remaining federal mineral estate with coal development potential in the population area would remain suitable for surface

mining. Exploration activities and new leases for underground mining in PHMA and GHMA would be subject to the limitations described above under *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Emery Population Area

Like Alternative A, 66,400 acres (over 99 percent) of federal mineral estate with high development potential and all federal mineral estate with moderate potential in the Emery Population Area would remain unacceptable for surface mining because it would lie beneath National Forest System surface. Exploration activities and new leases for underground mining in PHMA and GHMA would be subject to the limitations described above under *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A.

Panguitch Population Area

Like Alternative A, all federal mineral estate with high development potential within the Panguitch Population Area would remain suitable for surface mining. However, approximately 1,800 acres (90 percent) of federal mineral estate with moderate development potential in the population area would lie beneath National Forest System surface and would remain unsuitable for surface mining. Exploration activities and new leases for underground mining in PHMA and GHMA would be subject to the limitations described above under *Utah Sub-Region (Total Decision Area)*, thereby increasing impacts on coal compared with Alternative A. Surface mining in the Panguitch Population Area would be impacted as described below.

Existing disturbance within 4 miles of a lek is approaching the 3 percent disturbance cap in some areas. Additional disturbance or project expansion would likely result in meeting or exceeding the disturbance cap at the project level unless lands within the project area could be reclaimed to below cap levels. Reclamation that resulted in the ability for previously disturbed areas to be functioning as habitat would likely be achieved over a longer period and would not result in continuous mining operations below cap levels. As such, compliance with the disturbance cap at the project level could constrain production potential unless underground methods that meet requirements in the Proposed Plans for underground methods could be developed. Given the amount of disturbance associated with the existing Alton Coal surface mining operation on private minerals, and the proximity of that operation to the Sink Valley lek, there would likely be size and locational constraints on the expansion of surface mining activity, especially in the short term. Based on current mining practices, as well as information included in the Alton Coal Draft EIS (2011), there may be opportunities for continued coal mining using other methods, including high wall and underground mining methods.

Application of the 3.1-mile lek buffer could affect mine placement, though the required buffer distance could be adjusted based on local topography. Topography in the Panguitch Population Area is such that it is possible for leks to be located in areas screened by hills, cliffs, and canyons within 3.1 miles of nearby disturbance. While some distance other than 3.1 miles could be considered, the Panguitch Population Area is in an area of high coal potential so any restriction would reduce potential production by surface methods. Restrictions on noise above 10 decibels (weighted) above ambient levels during GRSG breeding season while birds are lekking could affect the daily operation of a mine during that 2-3 month breeding season. While this would not preclude a new mine or expanded operations, it could affect production during certain times of

the year. Specific measures to minimize and meet the noise requirement could be applied, including screening, mufflers, or underground mining methods. While these restrictions would constrain surface mining in occupied habitat in the Population Area and affect development of the coal resource on federal minerals, there are limited areas of moderate and high potential in the Population Area outside of occupied habitat that could be developed without restrictions.

4.21.4 Locatable Minerals

Methods and Assumptions

Analysis of impacts on locatable minerals from this LUPA focuses on the impacts of conservation measures to protect GRSG. These impacts may be direct or indirect. For example, a direct impact on locatable minerals would result from withdrawal of an area from locatable mineral entry. An indirect impact would result from removal of a road, which would change the economic feasibility of developing a site. Additional actions or conditions that might cause direct or indirect impacts on locatable minerals are described under *Indicators*, below.

Indicators

Indicators of impacts on locatable minerals are as follows:

- The amount of land withdrawn from locatable mineral entry
- The amount of land recommended for withdrawal from locatable mineral entry
- Application of restrictions, such as RDFs and conservation measures, that can be placed on locatable mineral development activities to prevent unnecessary or undue degradation of GRSG habitat as the law allows

Where information is available, consideration is given to the potential for locatable minerals on lands withdrawn from locatable mineral entry. For example, an indicator of an impact on locatable minerals is if there were substantial withdrawals from locatable mineral entry in high potential areas.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Restrictions on locatable mineral development could only occur through existing legal avenues such as the BLM's mandate to prevent unnecessary or undue degradation (43 CFR 3809) and the Forest Service's requirements for environmental protection (36 CFR 228.8). The management actions analyzed for this LUPA would not interfere with valid existing rights.
- It is understood that the ability to require additional mitigation measures as described in **Chapter 2**, specifically under Alternatives D and E and the Proposed Plans, is subject to valid existing rights, the Mining Law of 1872, as amended, and its implementing regulations. Agencies would work with the operator to implement the conservation measures described in **Chapter 2** (e.g., disturbance cap, seasonal restrictions and BMPs/RDFs for locatable minerals). For the purposes of this analysis, it is assumed that operators would implement the conservation measures. If

operators do not agree to the conservation measures, the impacts under the action alternatives and the Proposed Plans would be the same as under Alternative A.

- Management actions to withdraw areas from locatable mineral entry or prevent unnecessary or undue degradation apply to locatable mineral activity on all surface lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered and National Forest System surface and non-BLM-administered and non-National Forest System surface. There are 4,008,600 acres of federal mineral estate within the decision area (3,313,800 acres of BLM-administered and National Forest System surface with federal minerals and 694,800 acres of non-BLM-administered and non-National Forest System surface with federal minerals).
- Areas recommended for withdrawal would be withdrawn by a public land order issued by the Secretary of the Interior (5,000 acres or less) or by an act of Congress (over 5,000 acres).
- As discussed in the Minerals section of **Chapter 3**, it is reasonable to assume that development is most likely to continue in areas identified as having high potential. It is also reasonable to expect that new exploration, coupled with modern mining and milling methods, could result in new efforts to extract locatable minerals from mines in Utah.

Implementing management for the following resources to protect GRSG would have negligible or no impact on fluid minerals and are therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, Lands and Realty, and ACECs.

Alternative A

Under Alternative A, 498,200 acres (12 percent) of federal mineral estate in the decision area would remain withdrawn from location under the Mining Law of 1872, as amended, and an additional 560 acres (less than 1 percent) would continue to be recommended for withdrawal. If the Secretary issued a Public Land Order or Congress passed an act to formally withdraw these lands, subject to valid existing rights, the location of new mining claims under the Mining Law of 1872, as amended, would be prohibited. Exploration and mining would be allowed on prior existing, valid mining claims. Lands withdrawn from locatable mineral entry by Secretarial order are withdrawn for 20 years. After 20 years, these lands would need to be re-withdrawn.

Table 4.44 shows the total acreage open, withdrawn, and recommended for withdrawal by locatable mineral potential (high and moderate).

Under Alternative A, 28,000 acres (8 percent) of federal mineral estate with high potential would remain withdrawn, and an additional 40 acres (less than 1 percent) with high potential would continue to be recommended for withdrawal. Approximately 334,000 acres (92 percent) of federal mineral estate with high potential in the decision area would remain open to locatable mineral entry. This alternative would be the least restrictive of locatable minerals because a

Table 4.44
Locatable Mineral Withdrawals, Alternatives A, D, and E

Locatable Mineral Potential	Withdrawn from Locatable Mineral Entry[1]	Recommended for Withdrawal from Locatable Mineral Entry	Open to Locatable Mineral Entry
High	28,000	40	334,000
Moderate	470,200	520	3,171,400
Total	**498,200**	**560**	**3,505,400**

Source: BLM 2012d, 2015
[1]Acreage includes all types of withdrawals; not specific to locatable mineral withdrawals.

larger percentage of the decision area would be open to locatable mineral entry, and no additional restrictions would be applied to mining operations. Of the 3,642,000 acres of federal mineral estate with moderate potential, 470,200 acres (13 percent) would remain withdrawn.

Withdrawal or closure of an area to mining development eliminates the ability to access and extract the mineral resources in that area under new claims. This represents an impact on the potential discovery, development, and use of those resources by decreasing the availability of mineral resources. As directed by 43 CFR 3809.100, existing mining claims in areas withdrawn from mineral entry would have to undergo a validity exam. Claims without an economically viable discovery on the date of withdrawal would become void. The validity exam could delay the start of locatable mineral development on valid claims. Existing Notices or Plans of Operations would also have to undergo a validity exam before review (for Notice) or approval (for Plan of Operations) of any material change to the operation. The need to perform validity exams in areas withdrawn from locatable mineral entry would also greatly increase the burden on the BLM and Forest Service associated with processing mining claims, Notices, and Plans of Operations. Because there is high and moderate locatable mineral potential in GRSG habitat, withdrawing lands is expected to impact the locatable minerals program.

There are 2,575 mining claims and 39 locatable mine operations in the decision area. The existing operations would continue to operate under their accepted or approved mitigating measures to prevent unnecessary and undue degradation.

Alternative B

Like Alternative A, under Alternative B, 498,200 acres (12 percent) of federal mineral estate in the decision area would remain withdrawn from location under the Mining Law of 1872, as amended. Acres recommended for withdrawal would increase to 3,153,700 acres (79 percent of the decision area and all PHMA) under Alternative B, compared with 560 acres under Alternative A. If the Secretary issued a Public Land Order to formally withdraw these lands, subject to valid existing rights, the location of new mining claims under the Mining Law of 1872, as amended, would be prohibited. Exploration and mining would be allowed on prior existing, valid mining claims. Impacts from these actions would be the same type as those described under Alternative A; however, total withdrawals (including lands currently withdrawn) under Alternative B would increase to 7 times the acres withdrawn and recommended for withdrawal under Alternative A, thereby further limiting opportunities for locatable mineral development in

the decision area. **Table 4.45** shows the total acreage open, withdrawn, and recommended for withdrawal by locatable mineral potential (high and moderate).

Table 4.45
Locatable Mineral Withdrawals, Alternative B

Locatable Mineral Potential	Withdrawn from Locatable Mineral Entry[1]	Recommended for Withdrawal from Locatable Mineral Entry	Open to Locatable Mineral Entry
High	28,000	287,600	46,400
Moderate	470,200	2,866,100	305,800
Total	**498,200**	**3,153,700**	**352,200**

Source: BLM 2012d
[1]Acreage includes all types of withdrawals; not specific to locatable mineral withdrawals.

Under Alternative B, 287,600 acres (79 percent) of federal mineral estate with high potential in the decision area (including all PHMA) would be recommended for withdrawal, compared with 40 acres under Alternative A.

Of the 39 locatable mining operations in the decision area, 35 would be in PHMA under Alternative B. If the Secretary issued a Public Land Order or Congress passed an act to formally withdraw all lands in PHMA, as recommended by this alternative, the locatable mining operations in PHMA would require a validity examination for material changes, and additional constraints, such as seasonal restrictions, could be applied. Once formally withdrawn, the 2,039 existing claims in PHMA would also be subject to validity examinations in accordance with 43 CFR 3809.100 to determine whether or not the claim was valid on the date of the withdrawal and at the present time. The large increase in areas recommended for withdrawal under this alternative compared with Alternative A would increase the development delays described under Alternative A.

Exploration would be allowed on the 3,328,800 acres of federal mineral estate within PHMA but would be subject to TL stipulations and other restrictions. Most notably, exploration would be allowed only for gathering information about locatable mineral resources outside PHMA (e.g., evaluating structure of the area). Because of these limitations and the fact that PHMA would be withdrawn from locatable mineral entry, exploration in PHMA would decrease under this alternative. Decreases in exploration in PHMA could reduce the availability of data on locatable mineral resources and could increase costs of locatable mineral development if the limitations required use of more expensive exploration technology (such as helicopter portable drilling). TL stipulations on exploration would delay development activities and could cause equipment shortages because all exploration would be occurring during the same period.

Under this alternative, BMPs would be applied as appropriate and to the extent allowable by law within PHMA. Notices and Plans of Operations would not be able to be accepted (for Notices) or approved (for Plans of Operations) until operators incorporated these BMPs into their operations to avoid unnecessary and undue degradation. These BMPs could increase the costs of locatable mineral development compared with Alternative A.

Alternative C

Like Alternative A, under Alternative C, 498,200 acres (12 percent) of federal mineral estate in the decision area would remain withdrawn from location under the Mining Law of 1872, as amended. Under Alternative C, areas within mapped occupied habitat would be recommended for withdrawal in a manner similar to that under Alternative B; however, a larger number of acres would be recommended for withdrawal under Alternative C. Under this Alternative, 3,510,500 acres (88 percent of the decision area) would be recommended for withdrawal, compared with 560 acres under Alternative A. If the Secretary issued a Public Land Order or Congress passed an act to formally withdraw these lands, subject to valid existing rights, the location of new mining claims under the Mining Law of 1872, as amended, would be prohibited. Exploration and mining would be allowed on prior existing, valid mining claims. Impacts from these actions would be the same type as those described under Alternative A; however, total withdrawals (including lands currently withdrawn) under Alternative C would increase to 8 times the acres withdrawn and recommended for withdrawal under Alternative A, thereby further limiting opportunities for locatable mineral development in the decision area.

Table 4.46 shows the total acreage open, withdrawn, and recommended for withdrawal by locatable mineral potential (high and moderate). Under Alternative C, 334,000 acres (92 percent) of federal mineral estate with high potential in the decision area would be recommended for withdrawal, compared with 40 acres under Alternative A. The remainder of the high potential acres in the decision area would already be withdrawn.

Table 4.46
Locatable Mineral Withdrawals, Alternative C

Locatable Mineral Potential	Withdrawn from Locatable Mineral Entry[1]	Recommended for Withdrawal from Locatable Mineral Entry	Open to Locatable Mineral Entry
High	28,000	334,000	0
Moderate	470,200	3,176,500	0
Total	**498,200**	**3,510,500**	**0**

Source: BLM 2012d
[1]Acreage includes all types of withdrawals; not specific to locatable mineral withdrawals.

Under Alternative C, exploration would be prohibited on all 4,008,600 acres of federal mineral estate within the decision area. Withdrawing the decision area from mineral entry under the Mining Law of 1872, as amended, would prohibit exploration and may reduce the availability of mineral resources. Prohibiting exploration in the decision area could reduce development of locatable mineral resources in the decision area, even on existing claims. Operators with existing claims with undetermined validity would not be able to conduct new exploration on those claims except to confirm or corroborate mineral exposures as per 43 CFR 3809.100(b)(1).

All 39 locatable mining operations in the decision area would be in PHMA under Alternative C. Similar to Alternative B, if the Secretary issued a Public Land Order or Congress passed an act to formally withdraw all lands in PHMA, as recommended by Alternative C, the locatable mining operations in PHMA would require a validity examination for material changes and additional

constraints, such as seasonal restrictions, could be applied. Once formally withdrawn, the 2,575 existing claims in PHMA would also be subject to validity examinations in accordance with 43 CFR 3809.100 to determine whether or not the claim was valid on the date of the withdrawal and at the present time.

Similar to Alternative B, the large increase in areas recommended for withdrawal under Alternative C compared with Alternative A would increase the need for validity exams and the resulting development delays and costs on the BLM, Forest Service, or claimant described under Alternative A. Alternative C would result in the largest impact of these validity exams because the most acres would be withdrawn or recommended for withdrawal.

In the same way as under Alternative B, under Alternative C, BMPs would be applied as appropriate and to the extent allowable by law within PHMA. Notices and Plans of Operations would not be able to be accepted (for Notices) or approved (for Plans of Operations) until operators incorporated these BMPs into their operations to avoid unnecessary and undue degradation. This requirement would increase the costs of locatable mineral development compared with Alternative A, as described under Alternative B.

Alternative D

Like Alternative A, under Alternative D, 498,200 acres (12 percent) of federal mineral estate in the decision area would remain withdrawn from location under the Mining Law of 1872, as amended, and an additional 560 acres (less than 1 percent) would be recommended for withdrawal. Impacts from these actions would be the same as Alternative A.

Like Alternative B, under Alternative D, additional restrictions and BMPs for locatable minerals could apply in PHMA and GHMA. To the extent practicable, surface disturbance could be limited to under the 5 percent disturbance limit and enhancements of PHMA through on- or off-site mitigation could be requested through volunteer cooperation on behalf of the claimant/operator. These limits and mitigation measures could increase the costs of locatable mineral development compared with Alternative A, but not to the extent that locatable mineral development subject to such limits and mitigation measures would no longer be practicable.

Exploration would be allowed in the decision area under Alternative D, but seasonal restrictions would apply in nesting, brood-rearing, and winter habitat. While these restrictions would continue to apply to exploration in some areas under Alternative A, more consistent application under Alternative D would increase impacts on locatable minerals due to a potential decrease in exploration compared with Alternative A. Impacts of this decrease would be the same type as those described under Alternative B.

Alternative E

Like Alternative A, under Alternative E, 498,200 acres (12 percent) of federal mineral estate would remain withdrawn from location under the Mining Law of 1872, as amended, and an additional 560 acres (less than 1 percent) would continue to be recommended for withdrawal. Impacts from these actions would be the same as those described under Alternative A.

Similar to Alternative D, Alternative E would propose additional restrictions for locatable minerals that could apply in mapped GRSG habitat in SGMAs/core areas. To the extent

practicable, cumulative surface disturbance could be limited to less than 5 percent of occupied habitat in each population area, and enhancements of mapped GRSG habitat in SGMAs/core areas through on- and/or off-site mitigation could be requested. Like under Alternative D, these limits and mitigation measures could increase the costs of locatable mineral development compared with Alternative A, but not to the extent that locatable mineral development subject to such limits and mitigation measures would no longer be practicable. Limitations would only be imposed to the extent the claimant or operator was willing to apply them; therefore, the impacts of these limitations would be less than impacts of the limitations imposed under Alternatives B, C, and D.

CSU and TL stipulations would apply to exploration within mapped GRSG habitat in SGMAs/core areas, potentially causing a decrease in exploration from Alternative A. Impacts of this decrease in exploration would be the same type as those described under Alternative B.

Proposed Plans

Similar to Alternative A, under the Proposed Plans, 445,900 acres (11 percent) of federal mineral estate in the decision area would remain withdrawn from location under the Mining Law of 1872, as amended. Acres recommended for withdrawal would increase to 235,000 acres (6 percent of the decision area, including the SFA) under the Proposed Plans, compared with 560 acres under Alternative A. If the Secretary issued a Public Land Order to formally withdraw these lands, subject to valid existing rights, the location of new mining claims under the Mining Law of 1872, as amended, would be prohibited. Mining would be allowed on prior existing, valid mining claims. Impacts from these actions would be the same type as those described under Alternative A; however, total withdrawals (including lands currently withdrawn) under the Proposed Plans would increase by 37 percent over the acres withdrawn and recommended for withdrawal under Alternative A, thereby further limiting opportunities for locatable mineral development in the decision area. **Table 4.47** shows the total acreage open, withdrawn, and recommended for withdrawal by locatable mineral potential (high and moderate).

Table 4.47
Locatable Mineral Withdrawals, Proposed Plans

Locatable Mineral Potential	Withdrawn from Locatable Mineral Entry[1]	Recommended for Withdrawal from Locatable Mineral Entry	Open to Locatable Mineral Entry
High	28,000	1,800	338,800
Moderate	417,900	233,200	2,996,200
Total	**445,900**	**235,000**	**3,335,100**

Source: BLM 2015
[1]Acreage includes all types of withdrawals; not specific to locatable mineral withdrawals.

Under the Proposed Plans, 1,800 acres (less than 1 percent) of federal mineral estate with high potential in the decision area would be recommended for withdrawal, compared with 40 acres under Alternative A.

Of the 39 locatable mining operations in the decision area, none would be in the SFA under the Proposed Plans. However, 11 claims would be in the SFA. If the Secretary issued a Public Land Order or Congress passed an act to formally withdraw all lands in SFA, as recommended under

the Proposed Plans, before operations can begin on any existing mining claims in SFA they would undergo a validity examination in accordance with 43 CFR 3809.100 to determine whether or not the claim was valid on the date of the withdrawal as well as on the date of the examination. The increase in areas recommended for withdrawal under this alternative compared with Alternative A would increase the development delays described under Alternative A.

Under the Proposed Plans, to the extent consistent with the rights of a mining claimant under existing laws and regulations, surface-disturbance would be limited in PHMA. The agencies would work with claimants to apply the disturbance cap, minerals/energy density, RDFs, and seasonal restrictions in PHMA and mitigation for net conservation gain and lek buffers in PHMA and GHMA. However, under the Mining Law of 1872, as amended, the agencies do not have the authority to require such mitigation measures. As such, impacts on existing locatable mineral operations from these additional mitigation measures would be minimal. Overall, impacts on the locatable mineral program would increase under the Proposed Plans because of the additional acres recommended for withdrawal.

4.21.5 Mineral Materials

Methods and Assumptions

Analysis of impacts on mineral materials from this LUPA focuses on the impacts of conservation measures to protect GRSG. These impacts may be direct or indirect. For example, a direct impact on mineral materials would result from closure of an area to mineral material disposal. An indirect impact would result from removal of a road, which would change the economic feasibility of developing a site. Additional actions or conditions that might cause direct or indirect impacts on mineral materials are described under *Indicators*, below.

Indicators

Indicators of impacts on mineral materials are as follows:

- The amount of land closed to mineral material disposal
- The amount of land closed to commercial mineral material disposal
- The amount of land managed as ROW avoidance areas
- The amount of land managed as ROW exclusion areas
- Application of disturbance, timing, and other limitations
- The amount of land closed to fluid mineral leasing
- The amount of land subject to NSO stipulations on fluid mineral leasing

Where information is available, consideration is given to the potential for mineral materials on lands closed to mineral material disposal. For example, an indicator of an impact on mineral materials is if there were substantial closures to mineral material disposal in areas with occurrence of mineral materials.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Management actions apply to mineral material activity on surface lands overlying federal mineral estate, which includes all federal mineral estate underlying BLM-administered and National Forest System surface and non-BLM-administered and non-National Forest System surface. There are 4,008,600 acres of federal mineral estate within the decision area (3,313,800 acres of BLM-administered and National Forest System surface with federal minerals and 694,800 acres of non-BLM-administered and non-National Forest System surface with federal minerals).
- As described in the Minerals section of **Chapter 3**, future demand for mineral materials will vary depending upon market conditions, which differ according to economic conditions and construction activity. Construction projects within approximately 50 miles of mineral materials deposits may lead to development of these deposits. It is expected that mineral materials activity will continue at roughly the same level for the life of the LUPA.

Table 4.48 shows the number of acres open or closed to mineral materials disposal in areas of occurrence in the decision area under each alternative and the Proposed Plans.

Table 4.48
Mineral Materials in Areas of Occurrence by Alternative

Occurrence	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Closed to Disposal (acres)	21,800	1,140,000	1,295,300	103,200	21,900	1,196,900[1]
Open to Noncommercial Disposal but Closed to Commercial Disposal (acres)	N/A	N/A	N/A	1,030,900	N/A	N/A
Open to All Mineral Material Disposal (Commercial and Noncommercial) (acres)	1,273,500	155,300	0	161,200	1,325,600	152,400

BLM 2012d, 2015

[1]Under the Proposed Plans, PHMA would be open to free use permits and expansion of existing pits. There would be no new sales contracts or community pits in PHMA.

Of all federal mineral estate in the decision area, 1,884,300 acres (47 percent) have mineral material occurrence. A discussion of the impacts on mineral materials of management actions applicable to federal mineral estate in the decision area under each alternative follows.

Implementing management for the following resources to protect GRSG would have negligible or no impact on mineral materials and are therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire

Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, and ACECs.

Alternative A

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact mineral materials. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative A, 3,219,000 acres (97 percent) of BLM-administered and National Forest System surface within the decision area would continue to be open to ROW location. However, construction of new roads would likely decrease on the 94,800 acres (3 percent) of BLM-administered and National Forest System surface in the decision area that would continue to be managed as ROW avoidance or exclusion under this alternative, which would result in a decrease in demand for mineral materials in those areas. Impacts from this decrease in demand would be mitigated where new ROWs could be collocated within existing ROWs to satisfy valid existing rights.

Mineral Development
Management actions for mineral programs other than fluid minerals and mineral materials would not impact mineral materials. Therefore, only the impacts from fluid minerals and mineral materials management actions are discussed in the paragraphs below.

Fluid Minerals
Under Alternative A, 138,500 acres (3 percent) of federal mineral estate in the decision area would remain closed to new fluid mineral leasing, and 483,500 acres (12 percent) would remain subject to NSO stipulations. Closing areas to leasing would preclude oil and gas development in those areas, which would reduce demand for mineral materials. Application of NSO stipulations could have the same effect if the stipulations prevented oil and gas development. NSO stipulations prohibit surface disturbance in areas, so the oil and gas resources in those areas could only be accessed by directional drilling. If directional drilling was not feasible in an area, the minerals subject to the NSO stipulation would effectively be closed to new development.

Mineral Materials
Approximately 3,932,200 acres (98 percent) of federal mineral estate within the decision area would remain open to mineral material disposal under Alternative A, including 1,273,500 acres (98 percent) of federal mineral estate with mineral material occurrence in the decision area. Approximately 73,500 acres (2 percent) of federal mineral estate within the decision area would remain closed to mineral material disposal. This would include 21,800 acres (2 percent) of federal mineral estate with mineral material occurrence in the decision area. Closing these areas to mineral material disposal would result in pits relocating nearby to meet demand for road maintenance and other needs. If demand for mineral materials could not be met by pits operated on federal lands, pits would move onto private lands. If no mineral materials occurred near closed areas, developers would have to transport them to construction sites from farther away, which would alter the location of mineral materials development and increase

transportation costs associated with that development. However, because 98 percent of the decision area would remain open to mineral material disposal, the likelihood of this is low.

Management under Alternative A would continue to require reclamation of mineral material pits in accordance with developers' pit development plans.

Alternative B

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact mineral materials. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative B, all BLM-administered and National Forest System surface in PHMA (totaling 2,784,200 acres, or approximately 84 percent of BLM-administered and National Forest System surface in the decision area) would be managed as ROW exclusion areas. However, because all PHMA would be closed to mineral material disposal under Alternative B, managing areas as ROW exclusion in PHMA would have no impact on demand for mineral materials in PHMA.

All BLM-administered and National Forest System surface in GHMA (totaling 529,200 acres, or 16 percent of BLM-administered and National Forest System surface in the decision area) would be managed as ROW avoidance under Alternative B. Mineral materials beneath those 529,200 acres would be impacted by the ROW avoidance area as described under Alternative A; however, because 7 times more acres would be managed as ROW avoidance or exclusion under Alternative B, the magnitude of these impacts on the level of demand for mineral materials would increase.

Mineral Development
Management actions for mineral programs other than fluid minerals and mineral materials would not impact mineral materials. Therefore, only the impacts from fluid minerals and mineral materials management actions are discussed in the paragraphs below

<u>Fluid Minerals</u>
Under Alternative B, 3,341,300 acres (83 percent) of federal mineral estate in the decision area (including all PHMA) would be closed to new fluid mineral leasing, and 24,400 acres (1 percent) would be subject to NSO stipulations. However, because all PHMA would be closed to mineral materials disposal under Alternative B, closing PHMA to fluid mineral leasing would not impact demand for mineral materials in PHMA. Mineral materials in GHMA would be impacted by NSO stipulations as described under Alternative A.

<u>Mineral Materials</u>
Under Alternative B, approximately 3,340,000 acres of federal mineral estate in PHMA (83 percent of the federal mineral estate decision area) would be closed to mineral material disposal. This includes 1,140,000 acres with mineral material occurrence (87 percent of federal mineral estate with mineral material occurrence in the decision area). The types of impacts from these closures would be the same as those discussed under Alternative A; however, because 24

times more acres of federal mineral estate with mineral material occurrence would be closed under Alternative B, the magnitude of these impacts would increase.

Exploration would be allowed on the 3,328,800 acres of federal mineral estate within PHMA but would be subject to TL stipulations and other restrictions. Most notably, exploration would be allowed only for gathering information about mineral materials outside PHMA (e.g., evaluating structure of the area). Because of these limitations and the fact that PHMA would be closed to mineral material disposal, exploration in PHMA would decrease under this alternative. Decreases in exploration in PHMA could reduce the availability of data on mineral materials and could increase costs of mineral material development if the limitations required use of more expensive exploration technology (such as helicopter portable drilling). TL stipulations on exploration would delay development activities and could cause equipment shortages because all exploration would be occurring during the same period.

In PHMA, mineral material pits no longer in use would be restored to meet GRSG habitat conservation objectives. Requiring reclamation of mineral material pits no longer in use could increase costs on developers if additional reclamation beyond that required under Alternative A were necessary to meet the specific objectives related to GRSG habitat, and if the BLM and Forest Service required the developers to pay for the reclamation.

Management of mineral materials on federal mineral estate outside of PHMA would be the same as under Alternative A.

Alternative C

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact mineral materials. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative C, all BLM-administered and National Forest System surface within the decision area (3,313,800 acres) would be managed as ROW exclusion areas. However, because all mapped occupied habitat would be closed to mineral material disposal under Alternative C, managing areas as ROW exclusion in mapped occupied habitat would have no impact on mineral materials.

Mineral Development (including geothermal)
Management actions for mineral programs other than fluid minerals and mineral materials would not impact mineral materials. Therefore, only the impacts from fluid minerals and mineral materials management actions are discussed in the paragraphs below

<u>Fluid Minerals</u>
Under Alternative C, all federal mineral estate in the decision area would be closed to new fluid mineral leasing. The types of impacts on mineral materials demand from these management actions would be the same as those described under Alternative A, but the magnitude would increase due to the increase in acres closed. However, because all federal mineral estate in the decision area would be closed to mineral materials disposal under this alternative, development

of mineral materials in the decision area would not be impacted by fluid minerals management actions.

Mineral Materials

Under Alternative C, approximately 4,008,600 acres of federal mineral estate (the entire federal mineral estate decision area) would be closed to mineral material disposal. This includes all acres with mineral material occurrence in the decision area. The types of impacts from these closures would be the same as those discussed under Alternative A; however, because 39 times more acres of federal mineral estate with mineral material occurrence would be closed under Alternative C, the magnitude of these impacts would increase.

Under Alternative C, exploration would be prohibited on all 4,008,600 acres of federal mineral estate within the decision area. Closing the decision area to exploration could reduce the availability of data on mineral materials outside the decision area and could increase costs of mineral material development if it resulted in the need to conduct exploration for resources outside the decision area via less easily accessible locations than the locations within the decision area from which exploration might otherwise occur. Because the right to conduct exploration is part of a mineral materials permit, prohibiting exploration in the decision area would not reduce development of mineral materials in the decision area, even on existing permits.

Mineral material pits no longer in use in PHMA would be restored in the same fashion as that described under Alternative B; however, because all of the decision area would be designated as PHMA under Alternative C, this management action would apply to more acres.

Alternative D

Infrastructure Development (including all ROWs and utility corridors)

Management actions for programs related to infrastructure development other than lands and realty would not impact mineral materials. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative D, all BLM-administered and National Forest System surface within PHMA not already managed as ROW exclusion would be managed as ROW avoidance for surface and underground linear ROWs (including pipelines and roads). As a result, 2,754,200 acres (83 percent) of the surface decision area would be managed as ROW avoidance for these types of ROWs, and 27,600 acres (1 percent) would be managed as ROW exclusion. Demand for mineral materials from noncommercial operations in PHMA would be indirectly impacted in the manner described under Alternative A; however, because 29 times more acres of BLM-administered and National Forest System surface would be managed as ROW avoidance or exclusion under Alternative D, the magnitude of the impacts on demand for mineral materials would increase. Impacts would be mitigated by the allowance of new ROWs with limitations on noise and disturbance. Impacts would also be mitigated for existing leases in PHMA because collocation of new ROWs close to existing ROWs and minimal construction of new roads would be allowed. Because commercial mineral material operations would be prohibited in PHMA under this alternative, ROW restrictions would have no impact on these operations.

Under this alternative, areas of GHMA within 1 mile of an occupied lek would also be managed as ROW avoidance with exceptions for limited development with noise, structure height, and timing restrictions. Mineral material operations within 1 mile of an occupied lek would be impacted by this ROW avoidance in the manner described under Alternative A. Impacts would be mitigated where the ROW avoidance requirement was waived in exchange for off-site mitigation activities. However, the expense of these mitigation activities would increase the costs associated with road construction and would decrease demand for mineral materials if road construction became prohibitively expensive.

Mineral Development (including geothermal)

Management actions for mineral programs other than fluid minerals and mineral materials would not impact mineral materials. Therefore, only the impacts from fluid minerals and mineral materials management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative D, the same acreage would be closed to new fluid mineral leasing as that under Alternative A. Another 1,853,100 acres (46 percent) of federal mineral estate would be subject to NSO stipulations. The types of impacts on mineral materials demand from these management actions would be the same as those described under Alternative A; however, because more acres would be subject to NSO stipulations under Alternative D, the magnitude of those impacts would increase.

Mineral Materials

Under Alternative D, the BLM and Forest Service would prohibit mineral material disposal within 1 mile of leks and would close all PHMA to commercial mineral material disposal. Under this alternative, 2,967,500 acres (74 percent) of federal mineral estate within the decision area would be closed to commercial mineral material disposal but open to noncommercial mineral material disposal. This includes 1,030,900 acres with mineral material occurrence (79 percent of federal mineral estate with mineral material occurrence in the decision area). Noncommercial mineral material development would be allowed in these areas with restrictions on siting, disturbance, noise, structure, height, and timing. These types of restrictions would increase costs of mineral material development if they resulted in the use of more expensive technology or less-efficient development methods. Closing acres to commercial mineral material development would prevent large-scale commercial operations, while allowing county and community operations, which are generally smaller scale. Additionally, 352,800 acres of federal mineral estate within PHMA (9 percent of the decision area) would be closed to both commercial and noncommercial mineral material disposal, 103,200 acres of which have mineral material occurrence (8 percent of federal mineral estate with mineral material occurrence in the decision area). Impacts of these closures would be the same type as those described under Alternative A; however, because 3 times more acres of federal mineral estate would be closed to mineral materials disposal under Alternative D, the magnitude of those impacts would increase.

Mineral material development and maintenance activities would be prohibited in breeding and nesting, brood-rearing, and winter habitats during certain times of year in both PHMA and GHMA. In areas containing all three of these habitats, these restrictions could overlap such that

mineral material development activities would only be permitted in those areas from July 15 to November 15. Limiting mineral material development activities to 4 months of the year could essentially close an area to mineral material development.

In GHMA, mineral material disposal would be allowed outside of lek buffers with limitations on noise, structure height, and timing. These restrictions would have the same type of impact as described above. Impacts on mineral material development in GHMA would be mitigated where developers performed off-site mitigation in exchange for waiver of development restrictions.

Exploration would be allowed in the decision area under Alternative D, but seasonal restrictions would apply in nesting, brood-rearing, and winter habitat. While these restrictions would continue to apply to exploration in some areas under Alternative A, more consistent application under Alternative D would increase impacts on mineral materials due to a potential decrease in exploration compared with Alternative A. Impacts of this decrease would be the same type as those described under Alternative B.

Alternative E

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact mineral materials. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under Alternative E, all BLM-administered and National Forest System surface within mapped GRSG habitat in SGMAs/core areas not already managed as ROW exclusion would be managed as ROW avoidance. As a result, 2,654,000 acres (80 percent) of BLM-administered and National Forest System surface within the decision area would be managed as ROW avoidance, and 27,600 acres (1 percent) would be managed as ROW exclusion. Mineral materials in mapped GRSG habitat in SGMAs/core areas would be indirectly impacted in the manner described under Alternative A; however, because 28 times more acres of BLM-administered and National Forest System surface would be managed as ROW avoidance or exclusion under Alternative E, the magnitude of the impacts on demand for mineral materials would increase. Impacts would be mitigated by the allowance of new ROWs with limitations on noise, timing, and disturbance or where avoidance was not possible. However, mitigation would be required and could decrease demand for mineral materials, as described under Alternative D.

Under Alternative E, no management actions from this LUPA would apply to the 603,300 acres of BLM-administered and National Forest System surface outside of mapped GRSG habitat in SGMAs/core areas in the decision area (18 percent of the decision area). Management of these areas and impact of that management on mineral materials would be the same as described under Alternative A.

Mineral Development (including geothermal)
Management actions for mineral programs other than fluid minerals and mineral materials would not impact mineral materials. Therefore, only the impacts from fluid minerals and mineral materials management actions are discussed in the paragraphs below.

Fluid Minerals

Under Alternative E, the same acreage would be closed to new fluid mineral leasing as under Alternative A. Another 690,100 acres (17 percent) of federal mineral estate would be subject to NSO stipulations. The types of impacts on mineral materials demand from these management actions would be the same as those described under Alternative A; however, because more acres would be subject to NSO stipulations under Alternative E, the magnitude of those impacts would increase.

Mineral Materials

Under Alternative E, all federal mineral estate not closed to mineral material disposal under Alternative A would remain open (3,932,200 acres, or 98 percent of the decision area), including 1,325,600 acres with mineral material occurrence. Additional restrictions would apply to the 3,262,500 acres of federal mineral estate within mapped GRSG habitat in SGMAs/core areas (81 percent of the decision area), including maximum cumulative new permanent disturbance from mineral materials development of no more than 5 percent of mapped GRSG habitat in SGMAs/core areas in each population area. Noise, structure height, and TL stipulations would also apply. Impacts of these restrictions on mineral material development would be the same type as described under Alternative D. Mitigation might also be required, which would increase costs of mineral material development.

CSU and TL stipulations would apply to exploration within mapped GRSG habitat in SGMAs/core areas, potentially causing a decrease in exploration from Alternative A. Impacts of this decrease in exploration would be the same type as those described under Alternative B.

The 743,200 acres (19 percent) of federal mineral estate in the decision area outside mapped GRSG habitat in SGMAs/noncore areas under this alternative would be subject to the same management as under Alternative A.

Proposed Plans

Special Status Species – GRSG

Under the Proposed Plans, the application of the 3 percent disturbance cap (5 percent on National Forest System lands in Wyoming) and in PHMA could impact mineral material activities by preventing new surface development. New mineral material pits or expansion of existing pits could be precluded if the cap were exceeded in a BSU or a proposed project analysis area. In cases where development was allowed, mitigation requirements would increase the cost of development.

Applying lek buffer distances when approving actions for surface disturbance could restrict mineral materials development in GHMA and could cause development to move away from desired locations.

RDFs would be applied as under the action alternatives and impacts would be similar in nature and magnitude as Alternative D.

Infrastructure Development (including all ROWs and utility corridors)
Management actions for programs related to infrastructure development other than lands and realty would not impact mineral materials. Therefore, only the impacts from lands and realty management actions are discussed in the paragraphs below.

Under the Proposed Plans, all BLM-administered and National Forest System surface within PHMA not already managed as ROW exclusion would be managed as ROW avoidance for new linear and site-type ROWs, except for within ROW corridors designated for aboveground use. However, because all PHMA would be closed to mineral material disposal under the Proposed Plans, managing areas as ROW avoidance in PHMA would have no impact on demand for mineral materials in PHMA.

Under the Proposed Plans, all BLM-administered and National Forest System surface within GHMA would be available for ROW location, except for 17,600 acres already managed as exclusion. While these areas would be open, ROW development in GHMA would be subject to lek buffers and net conservation gain requirements, which could impact mineral material development as discussed under *Special Status Species – GRSG*. If disturbance is pushed to areas without restrictions then overall demand for mineral materials will not be affected. However, if the area of new disturbance decreases across the landscape, the demand for mineral materials could decrease over Alternative A.

Mineral Development (including geothermal)
Management actions for mineral programs other than fluid minerals and mineral materials would not impact mineral materials. Therefore, only the impacts from fluid minerals and mineral materials management actions are discussed in the paragraphs below

Fluid Minerals
Under the Proposed Plans, the number of acres closed to all new fluid mineral leasing would be only slightly higher than under Alternative A so the magnitude of impacts would be similar. More than six times more acres would be subject to NSO stipulations under the Proposed Plans than Alternative A, including all PHMA. The types of impacts on mineral materials demand from these management actions would be the same as those described under Alternative A; however, because more acres would be subject to NSO stipulations under the Proposed Plans, the magnitude of those impacts would increase.

Mineral Materials
Under the Proposed Plans, National Forest System lands in the Wyoming portion of the planning area would remain open to mineral material disposal. Lands managed according to the BLM and the Forest Service-Utah Proposed Plans in PHMA (82 percent of the federal mineral estate decision area) would be closed to mineral material disposal. This includes 1,196,900 acres with mineral material occurrence (89 percent of federal mineral estate with mineral material occurrence in the decision area). Impacts would be somewhat mitigated because new free use permits and expansion of existing pits would be allowed, subject to restrictions. The types of impacts from these closures would be the same as those discussed under Alternative A; however, because 55 times more acres of federal mineral estate with mineral material occurrence would be closed under the Proposed Plans, the possibility for impacts would increase. It should be noted, however, that there are approximately 24,000 acres under a

mineral material permit within GRSG habitat statewide. Further, with approximately 1,100 acres of existing disturbance associated with those mineral material pits there are opportunities for existing pits to expand within their existing permitted areas. This is because less than 5 percent of the existing permitted area has been disturbed so expansion would fall under the disturbance cap at the project level, at least for most pits. Therefore, while there may be site-specific instances where a new pit in occupied GRSG habitat is denied, the potential for this is low because there is additional development opportunity at existing sites.

In GHMA, lek buffer distances to protect GRSG and their habitat, as discussed under *Special Status Species – GRSG* could restrict development in some areas, which could result in the development being placed in other locations or require compensatory mitigation, but would not prohibit such activities.

4.21.6 Oil Shale and Tar Sands

Methods and Assumptions

As discussed in **Section 2.11.2**, Make GRSG Habitat Available for Oil Shale and Tar Sands Leasing, this LUPA does not include leasing allocation decisions for oil shale and tar sands in Utah. This is because the ROD for Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the BLM in Colorado, Utah, and Wyoming closed all mapped occupied GRSG habitat on BLM-administered lands to oil shale and tar sands leasing and development with the exceptions of the pending lease application in the Asphalt Ridge Special Tar Sands Area and the White River Oil Shale Research, Development, and Demonstration site and Preference Lease Right Area (BLM 2013). Within these two areas, leasing and development would be allowed to occur; however, certain management actions and allocation-based decisions being considered in this LUPA could impact the feasibility, amount, and type of development. For example, depending on the alternative selected, GRSG habitat that overlaps the above-mentioned areas may be subject to surface disturbance thresholds, timing restrictions, and other GRSG protection measures. In addition, managing surrounding lands as ROW exclusion or avoidance areas could impact road and facility construction to access and develop those leases.

Indicators

Indicators of impacts on oil shale and tar sands are as follows:

- Application of conservation measures for GRSG to existing pending leases
- The amount of land managed as ROW avoidance areas
- The amount of land managed as ROW exclusion areas

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- The White River Oil Shale Research, Development, and Demonstration site lease would be a valid existing right under all alternatives. The White River Oil Shale Preference Right Lease Area would remain open for oil shale and tar sands development under all alternatives, subject to stipulations outlined in the Vernal RMP and site-specific leasing NEPA analyses. The lease terms for the White River

Oil Shale Research, Development, and Demonstration lease commit the BLM to granting a commercial lease covering the additional 4,960 acres of the Preference Right Lease Area, if all terms and conditions of the Research, Development, and Demonstration lease are met. Therefore, under all alternatives, the White River Oil Shale Research, Development, and Demonstration site and Preference Right Lease Area could continue to be developed.

- If the pending federal lease within the Asphalt Ridge Special Tar Sands Area were issued before the signing of the ROD for this LUPA, it, too, would be considered a valid existing right that could be developed under all alternatives. However, if it were not issued before the signing of the ROD for this LUPA, the federal tar sands lease in the Asphalt Ridge Special Tar Sands Area could still be issued subject to the conservation measures in the LUPA.
- Because ROWs are not required for construction of roads and facilities within a lease, these areas would not be impacted by ROW exclusion or avoidance areas proposed under any alternative. Road and facility construction to access existing leases from outside the lease may be impacted by restrictions described under individual alternatives.

Implementing management for the following resources to protect GRSG would have negligible or no impact on oil shale and tar sands and is therefore not discussed in detail: Vegetation Management, Integrated Invasive Species Management, Wild Horses and Burros, Wildland Fire Management, Livestock Grazing/Range Management, Recreation, Comprehensive Travel and Transportation Management, and ACECs.

Alternative A

Special Status Species – GRSG

Under Alternative A, no disturbance cap would be applied to anthropogenic disturbance in GRSG habitat. Therefore, oil shale and tar sands development could continue to occur subject to stipulations and other restrictions applied in the Vernal RMP (for the White River Oil Shale Preference Right Lease Area) and site-specific NEPA analyses.

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative A, 97 percent of BLM-administered and National Forest System surface within the decision area would continue to be open to ROW location. If exclusion or avoidance areas are near the White River Oil Shale Preference Right Lease Area or the pending lease in the Asphalt Ridge Special Tar Sands Area, there could be indirect impacts resulting from the limits on the available means for accessing and transporting oil shale and tar sands to processing facilities and markets. Impacts would be mitigated where new ROWs could be collocated within existing ROWs to satisfy valid existing rights.

Alternative B

Special Status Species – GRSG

Under Alternative B, no disturbance cap would be applied to anthropogenic disturbance in GHMA. Because the existing and pending leases would be in GHMA under this alternative, oil

shale and tar sands development could continue to occur subject to stipulations and other restrictions applied in the Vernal RMP (for the White River Oil Shale Preference Right Lease Area) and site-specific NEPA analyses. Impacts would be the same as those under Alternative A.

Infrastructure Development (including all ROWs and utility corridors)
Under Alternative B, approximately 2,320 acres of the White River Oil Shale Preference Right Lease Area and all 2,120 acres of the pending federal lease within the Asphalt Ridge Special Tar Sands Area would be in GHMA. All BLM-administered and National Forest System surface in GHMA would be managed as ROW avoidance under Alternative B. There could be indirect impacts resulting from the limits on access and the available means for transporting oil shale and tar sands to processing facilities and markets. Impacts would be mitigated where new ROWs could be collocated within existing ROWs to satisfy valid existing rights.

Alternative C

Special Status Species – GRSG
Under Alternative C, disturbance in PHMA would be subject to a 3 percent cap, which would include fire. Approximately 2,320 acres of the White River Oil Shale Preference Right Lease Area and all 2,120 acres of the pending federal lease within the Asphalt Ridge Special Tar Sands Area would be in PHMA. The Uintah Population Area, where the White River Oil Shale Preference Right Lease Area is located, is currently just under the 3 percent disturbance cap. New development could push the area over the cap and reduce opportunities for new surface disturbance in this portion of the Preference Right Lease Area until areas are reclaimed to the point where disturbance is below the threshold.

Infrastructure Development (including all ROWs and utility corridors)
Under Alternative C, approximately 2,320 acres of the White River Oil Shale Preference Right Lease Area and all 2,120 acres of the pending federal lease within the Asphalt Ridge Special Tar Sands Area would be in PHMA. All BLM-administered and National Forest System surface in PHMA would be managed as exclusion under Alternative C. The impacts on existing leases would be the same type as those described under Alternative B; however, the magnitude of impacts could be more severe because new ROWs would not be permitted.

Alternative D

Special Status Species – GRSG
Under Alternative D, no disturbance cap would be applied to anthropogenic disturbance in GHMA. Because the existing and pending leases would be in GHMA under this alternative, oil shale and tar sands development could continue to occur subject to stipulations and other restrictions applied in the Vernal RMP (for the White River Oil Shale Preference Right Lease Area) and site-specific NEPA analyses. Impacts would be the same as those under Alternative A.

Infrastructure Development (including all ROWs and utility corridors)
Under this alternative, areas of GHMA within 1 mile of an occupied lek would be managed as ROW avoidance with exceptions for limited development with noise, structure height, and timing restrictions. Approximately 2,320 acres of the White River Oil Shale Preference Right Lease Area and all 2,120 acres of the pending federal lease within the Asphalt Ridge Special Tar

Sands Area would be in GHMA and would be impacted by this management, as described under Alternative B. Impacts would be mitigated where the ROW avoidance requirement was waived in exchange for off-site mitigation activities. However, the expense of these mitigation activities could increase the costs of oil shale and tar sands development.

Alternative E

Special Status Species – GRSG

Under Alternative E, no disturbance cap would be applied to anthropogenic disturbance in mapped occupied GRSG habitat outside SGMAs/noncore areas. Because the existing and pending leases would be in mapped occupied GRSG habitat outside SGMAs/non-core areas under this alternative, oil shale and tar sands development could continue to occur subject to stipulations and other restrictions applied in the Vernal RMP (for the White River Oil Shale Preference Right Lease Area) and site-specific NEPA analyses. Impacts would be the same as those under Alternative A

Infrastructure Development (including all ROWs and utility corridors)

Under Alternative E, no management actions from this LUPA would apply to BLM-administered and National Forest System surface outside of mapped GRSG habitat in SGMAs/noncore areas. Approximately 2,320 acres of the White River Oil Shale Preference Right Lease Area and all 2,120 acres of the pending federal lease within the Asphalt Ridge Special Tar Sands Area would be outside mapped GRSG habitat in SGMAs/noncore areas and would be subject to the same management as under Alternative A.

Proposed Plans

Special Status Species – GRSG

Under the Proposed Plans, no disturbance cap would be applied to anthropogenic disturbance in GHMA. Because the existing and pending leases would be in GHMA under this alternative, oil shale and tar sands development could continue to occur subject to stipulations and other restrictions applied in the Vernal RMP (for the White River Oil Shale Preference Right Lease Area) and site-specific NEPA analyses. Impacts would be the same as those under Alternative A.

However, oil shale and tar sands development in GHMA would be subject to RDFs, lek buffers, and net conservation gain requirements, which could impact oil shale and tar sands development by restricting new surface development. Applying lek buffer distances when approving actions for linear features, infrastructure related to energy development, tall structures (including transmission lines), surface disturbance, and noise could also restrict development of infrastructure related to oil shale and tar sands development.

Infrastructure Development (including all ROWs and utility corridors)

Under the Proposed Plans, GHMA would be available for the types of ROW location that would impact oil shale and tar sands development. However, ROW development in GHMA would be subject to lek buffers and net conservation gain requirements, which could impact oil shale and tar sands development as discussed under *Special Status Species – GRSG*. The expense of these mitigation activities would increase the costs of oil shale and tar sands development. Approximately 2,320 acres of the White River Oil Shale Preference Right Lease Area and all

2,120 acres of the pending federal lease within the Asphalt Ridge Special Tar Sands Area would be in GHMA and would be impacted by this management.

4.22 SPECIAL DESIGNATIONS

4.22.1 Areas of Critical Environmental Concern and Zoological Areas

Methods and Assumptions

Direct impacts on ACECs and zoological areas are considered to be those that either impair or enhance the values for which the ACEC or zoological area was proposed for designation. As such, this analysis focuses on relevance and importance criteria for each potential ACEC and zoological area and impacts on these values from either the special management derived from designation as an ACEC or zoological area or, under alternatives where an ACEC or zoological area is not proposed for designation, the management actions for other resources. All impacts discussed are direct impacts, though some may not occur immediately after implementation of management actions.

Indicators

Impacts on ACECs and zoological areas would occur from management actions that protect or impair relevant and important values, including "important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes" (BLM Manual 1613, Areas of Critical Environmental Concern). As such, indicators of impacts are allocations for surface-disturbing activities within existing or potential ACECs and zoological areas that could affect the relevant and important values for which the area was designated.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Management for existing ACECs was determined in the applicable RMPs to be adequate to support the relevant and important values at the time of their designation. Impacts on these ACECs are not further discussed because the BLM would continue to manage these ACECs to protect their relevant and important values. Management to protect GRSG under the various alternatives could provide additional protections for existing ACECs and, at a minimum, would provide complementary management.
- Although management actions for most resources and resource uses have decision area-wide application, ACEC and zoological area management prescriptions apply only to those lands within each specific ACEC or zoological area.
- Permitted activities would not be allowed to impair the relevant and important values for which the ACECs and zoological areas are designated. The exception is locatable minerals; until withdrawn from mineral entry, a mining claim can be filed, and subsequent mining could have an impact.
- ACEC and zoological area designation provides protection and focused management of relevant values beyond that provided through general management of the relevant and important value(s) elsewhere in the decision area.

- Any designated ACEC that falls within a WSA would be managed according to BLM Manual 6330, Management of Wilderness Study Areas, unless the ACEC management is more restrictive. Because activities within WSAs must meet the nonimpairment criterion, which generally restricts new surface disturbance, it is assumed that a WSA would generally protect relevant and important values and would have a beneficial effect on overlapping designated and undesignated ACECs. If Congress were to release a WSA from further consideration, the special management in designated ACECs would be designed to protect and enhance the relevant and important values.

Alternatives Analysis

Sagebrush habitat is the only relevant and important value identified for the 15 potential BLM ACECs and Forest Service zoological areas proposed for designation under Alternative C. Refer to **Section 4.3** and **Section 4.8**, for detailed analyses of sagebrush management in the decision area, including the areas encompassing these 15 proposed ACECs and Zoological Areas. Different management would apply to the different areas, as described in **Chapter 2**, impacts of which are discussed in **Section 4.3** and **Section 4.8**.

The remaining impact analysis in this section is specific to the seven currently designated ACECs on BLM-administered land that overlap mapped occupied habitat. Impacts on the relevant and important values, shown in **Table 3.108**, would mainly be from surface-disturbing activities that cause direct damage to the values, introduce modifications to the landscape that affect the area's scenic quality or historical or cultural context, or that result in erosion, sedimentation, or increased runoff.

Under Alternative A, the BLM would continue to manage the seven designated ACECs within mapped occupied habitat to protect the identified relevant and important values (**Table 3.108**). GRSG is not an identified relevant and important value in any of the seven designated ACECs.

Under the action alternatives, there would be varying levels of restrictions on surface-disturbing activities in PHMA/mapped GRSG habitat in SGMAs/core areas, as well as GHMA under Alternatives B and D and the Proposed Plans[2], to protect GRSG. These restrictions would apply to the seven existing ACECs within GRSG habitat and would range from precluding nearly all new surface-disturbing activities under Alternatives B and C to allowing surface-disturbing activities with stipulations, RDFs, or BMPs under Alternatives D and E and the Proposed Plans. Where current management is more restrictive than what is proposed in the action alternatives, current management would continue to apply. As a result, each action alternative and the Proposed Plans would be at least as restrictive as current management. Adopting more-restrictive management of surface-disturbing activities under the action alternatives would be complementary to the protection of the relevant and important values of the existing ACECs. Therefore, in general, the action alternatives and the Proposed Plans could enhance the relevant and important values of the existing ACECs to a greater extent than Alternative A. In all cases, the relevant and important values would be protected from irreparable damage.

[2] Under Alternative C, all occupied GRSG habitat would be designated as PHMA; there are no GHMA under Alternative C.

Refer to **Table 2.3** for acres of PHMA/mapped GRSG habitat in SGMAs/core areas and GHMA/mapped GRSG habitat outside SGMAs/noncore areas, as well as acres of various restrictions on surface-disturbing activities, by alternative and for the Proposed Plans. Where existing ACECs overlap these restrictions, managing for GRSG would be complementary to managing for the relevant and important values in the existing ACECs and they would continue to be protected.

4.22.2 Wilderness Study Areas

Methods and Assumptions

Indicators

Indicators of impacts on WSAs are impacts on their wilderness characteristics of natural appearance, outstanding opportunities for solitude or primitive and unconfined recreation, and unique or supplemental values.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- The WSAs in the planning area would continue to be managed according to BLM Manual 6330, Management of Wilderness Study Areas, until Congress either designates or releases all or portions of the WSAs from further consideration. Managing the WSAs according to BLM Manual 6330, Management of Wilderness Study Areas, will protect their wilderness characteristics in a manner that will not "impair the suitability of WSAs for preservation as wilderness" (FLPMA Section 603[c]). This is known as the "nonimpairment standard."
- Actions that would "impair the suitability of WSAs for preservation as wilderness" would not be permitted unless they were to meet one of the following exception criteria described in BLM Manual 6330, Management of Wilderness Study Areas:
  - Emergencies such as suppression activities associated with wildfire or search and rescue operations
  - Restoration of impacts from violations and emergencies Uses and facilities that are considered grandfathered or valid existing rights
  - Uses and facilities that clearly protect or enhance the land's wilderness values or that are the minimum necessary for public health and safety in the use and enjoyment of the wilderness values
- Management of WSAs is subject to valid existing rights and grandfathered uses under all alternatives, consistent with BLM Manual 6330, Management of Wilderness Study Areas.
- As a grandfathered use, grazing in WSAs is determined by the active AUMs permitted at the time of designation for any allotment that is wholly or partly within the WSAs. Maintenance of existing facilities and construction of new facilities necessary to manage and use permitted AUMs would be conducted in accordance with the nonimpairment standard. As a grandfathered use, livestock grazing managed

in accordance with BLM regulations does not impact wilderness characteristics. However, new grazing management is not a grandfathered use and in all cases may only be established if it meets the nonimpairment standard or one of the exceptions.

Alternatives Analysis

Due to the requirement that any activity in WSAs meet the nonimpairment standard described in BLM Manual 6330, Management of Wilderness Study Areas, implementing management proposed in the various alternatives and the BLM Proposed Plan would not impair wilderness characteristics. Management to protect GRSG could enhance naturalness, or, at a minimum, be complementary to management in WSAs. This would not vary greatly between the alternatives and the Proposed Plan.

4.22.3 Other Special Designations

Existing management under the proclamation and monument management plan for the Grand Staircase-Escalante National Monument is more restrictive than management actions being considered under this LUPA/EIS for that area. As discussed in **Chapter 2**, where management that is more restrictive is already in place, no changes would be made under action alternatives or the BLM Proposed Plan. As such, there would be no impact on scientific and historic monument objects.

Existing management of the Flaming Gorge National Recreation Area is also generally more restrictive than management actions being considered under this LUPA/EIS for that area. For the reasons outlined in the preceding paragraph there would be no impact on recreational uses.

National Historic Trails

Methods and Assumptions

Indicators

Impacts on national historic trails would occur if substantial interference to the values for which the components of the System were designated occurs. For all agency undertakings that could impact national historic trails, the BLM complies with Section 106 of the National Historic Preservation Act before the undertaking. Section 106 compliance typically includes inventory, evaluation, and consultation with the Utah State Historic Preservation Office.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumption:

- National Historic Trails would be managed according to policy provided in BLM Manual 6250, National Scenic and Historic Trail Administration, BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation, and Forest Service Manual 2300, Chapter 2350, Part 2353, National Forest System Trails.

Alternatives Analysis

Direct impacts on national historic trails typically result from actions that impact the resources, qualities, values, and associated settings of the public land areas through which such National Trails may pass, and the primary trail use or uses, introduce visual elements out of character with the property or that alter its setting, or result in neglect of the resource to the extent that it is impaired or destroyed. For example, surface-disturbing activities that destroy or alter trail ruts for historic trails are considered a direct impact. Direct impacts also include proactive trail management, such as the preservation of buffer zones.

Management of the lands next to national historic trails could impact trail features and the visitor experience. Habitat improvement projects could indirectly provide some enhancement or preservation of national historic trails qualities. The type of impacts would be the same under all alternatives but would vary depending upon the degree of treatments.

Impacts on national trails from livestock grazing include trampling and manure impacts. The intensity of the impact would vary with the visitor's experience of recreating in areas where livestock graze. In addition, development of livestock grazing facilities impacts the naturalness attribute of the physical setting. Stock ponds and catchments contrast with the natural landscape.

Future comprehensive travel and transportation management implementation decisions for the national historic trails could directly impact trail usage. Travel restrictions would impact the types of experiences available along these trails. Impacts under all alternatives would be similar. Travel management can also impact the trail resources, qualities, values, and associated settings. Specifically, open travel under Alternative A on or near a trail could degrade the trail settings, as well as trail-related historic sites. Under the action alternatives and the Proposed Plans, limiting travel to existing or designated routes would eliminate those impacts.

Generally, development of pipelines and electricity transmission and distribution facilities next to trails could directly impact the trail during construction. Indirect impacts from development in the trail corridor could include changes to scenic resources over the long term due to the presence of transmission lines and other facilities.

Under all alternatives and the Proposed Plans, the BLM and Forest Service would continue to manage the California, Old Spanish, and Pony Express National Historic Trails in accordance with direction in approved LUPs; BLM Manual 6250, National Scenic and Historic Trail Administration; BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation; and the existing comprehensive plan for the California and Pony Express National Historic Trails (National Park Service 1999). A comprehensive plan for the Old Spanish National Historic Trail is being developed jointly by the BLM and National Park Service. New policy addressing the management of National Historic Trails was issued by the BLM in 2012. As RMPs are updated, the BLM will ensure requirements provided in BLM Manual 6280 are incorporated. In the interim, this policy will be adhered to during any site-specific project NEPA analyses that are conducted in the planning area. Parts of national trails on National Forest System lands would continue to be managed in accordance with Forest Service Manual 2300, Chapter 2350, Part 2353, National Forest System Trails.

Under the action alternatives, there would be restrictions of surface-disturbing activities in PHMA/mapped GRSG habitat in SGMAs/core areas, as well as GHMA under Alternatives B and D, to protect GRSG. Restrictions on surface-disturbing activities under the Proposed Plans would apply primarily in PHMA and, to a lesser extent, in GHMA. Restrictions range from precluding nearly all new surface-disturbing activities under Alternatives B and C to allowing surface-disturbing activities with stipulations, RDFs, or BMPs under Alternatives D and E and the Proposed Plans. Because management proposed under the action alternatives and the Proposed Plans would not apply in instances where current management is more restrictive, managing for GRSG under the action alternatives would, at a minimum, provide similar management to Alternative A. Under alternatives where more-stringent restrictions on surface-disturbing activities would apply than under Alternative A, implementing such restrictions would be complimentary to the protection of national historic trails.

Refer to **Table 2.3** for acres of PHMA/mapped GRSG habitat in SGMAs/core areas and GHMA/GRSG habitat outside SGMAs/noncore areas, as well as acres of various restrictions on surface-disturbing activities, by alternative and for the Proposed Plans. Where national historic trails overlap these restrictions, the trails' values would be protected.

4.23 Social and Economic Impacts (Including Environmental Justice)

4.23.1 General Description

This section discusses social and economic impacts from proposed GRSG management actions related to other resources and resource uses. Existing social and economic conditions are described in the Social and Economic Conditions (Including Environmental Justice) section of **Chapter 3**. This section also addresses environmental justice impacts and the differences between alternatives for the social and economic impacts identified.

4.23.2 Methodology and Assumptions

For the analysis of economic impacts, quantitative estimates are provided where sufficient data or estimates are available on the potential changes in authorized uses of federal lands under each alternative. When quantitative estimates of economic impacts were not possible, a qualitative discussion of the potential economic impacts associated with management actions associated with specific authorized uses is presented. Therefore, the overall economic impacts are a combination of quantitative estimates and qualitative discussion. For quantitative estimates, IMPLAN was used to estimate impacts on output, employment, and earnings in the primary study area, including those derived from the multiplier effect. The multiplier effect captures the impact of initial expenditures on subsequent rounds of expenditures derived from the initial income generated as well as the impact of initial expenditures in one sector of the economy on other inter-related sectors. This allows for a more complete picture of the economic impacts of the management alternatives. However, the IMPLAN model is a static model, and it does not capture changes in the industrial composition of a region over time, nor does it capture dynamic effects that may be associated with processes of growth or decline, such as changes in technology or labor productivity or the feasibility of economic operations that require scale. There is, therefore, a degree of uncertainty in the estimates of impacts obtained through the IMPLAN model. Data used for adjusting IMPLAN parameters in the study area were based on the best available data at the time of the study. Recent growth trends in employment and output

in certain sectors in the study area are unlikely to meaningfully affect these estimates because the study area parameters used by IMPLAN (e.g., productivity, trade data) are likely to not change as quickly as trends in absolute employment and output.

For the analysis of social impacts, two other types of impacts were considered. The first is that derived from migration induced by management actions. These impacts are induced by economic opportunities that drive population into or out of specific areas and affect population growth as well as the demand for housing and public services. The second is that associated with specific interest groups, community livelihoods, or minority and low income populations (Environmental Justice).

To the extent that there is a degree of uncertainty regarding the changes in authorized uses of Federal lands under each management alternative, this uncertainty is carried forward to the socioeconomic impacts of management alternatives.

Alternatives B and C and the Proposed Plans include a 3 percent disturbance cap (5 percent on National Forest System lands in Wyoming) in PHMA, independent of surface ownership. The Proposed Plans also include an adaptive management strategy. If the disturbance cap is reached, economic activity on BLM and National Forest System lands could be curtailed further than what is described in this section. Under the adaptive management strategy, additional measures could be taken to protect GRSG habitat based on triggers linked to indicators monitored by BLM and the Forest Service. If triggered, these additional measures could also impose additional restrictions on economic activity. However, because the disturbance cap and adaptive management soft and hard triggers only apply to PHMA, they would not generate additional socioeconomic impacts through economic activities that are already limited in PHMA under various management alternatives.

The following are summaries of the types of social and economic impacts from management actions related to the protection of GRSG within the study area:

- Direct economic activity dependent on BLM-administered and National Forest System land and resource management
- Overall employment, earnings, output, and earnings per job associated with economic activities impacted by management alternatives
- Tax revenues and payments to states and counties
- Other (nonmarket) values, including GRSG conservation benefits
- Population
- Housing and public services
- Consistency with county LUPs
- Interest groups and communities of place
- Environmental Justice

This section is organized differently from other impact sections. Rather than grouping the analysis of impacts by alternative, the analysis of economic impacts is grouped by affected

resource followed by an overall discussion of aggregate social and economic impacts and benefits. This grouping assists with the reader's understanding of the analytical approach and assumptions used to analyze economic and social impacts associated with each resource use and facilitates interpretation of the results. Impacts are grouped by alternative in **Section 4.23.5**, Summary of Economic and Social Impacts, and in **Table 4.63**. Varying types and levels of adaptive management, habitat objectives, disturbance caps, and habitat designations under each alternative help determine the relative effectiveness of implementing measures and achieving GRSG habitat conservation under each alternative. A qualitative discussion of effectiveness and efficiency is included **Section 4.23.5.**

Assumptions

In addition to the assumptions in **Section 4.2.1**, the following list presents a few basic assumptions related to social and economic impact assessment for Alternatives A through E and the Proposed Plans. Additional details of assumptions made in developing the quantitative estimates of economic impacts of management alternatives through grazing, oil and gas, coal and wind energy, are included in **Appendix W**, Economic Impact Analysis Methodology.

- The analysis of economic impacts of management alternatives on grazing assumes active AUMs represent an upper bound to impacts, while billed AUMs represent an estimate of actual annual use based on recent billing trends. Active AUMs measure the amount of forage from land available for grazing. Forest Service terms this measure "permitted" AUMs. Billed AUMs measure the amount of forage the BLM and Forest Service bill for annually. Forest Service uses the term "authorized" AUMs for the same concept.
- The analysis of quantitative impacts of management alternatives affecting oil and gas development on federal lands assumes that operators who are unable to drill on federal lands would not access the same oil and gas from nearby private or state lands. To the degree that a shift to private or state lands would occur, the impact estimates would be lower for restrictions on drilling and production on federal lands.
- The analysis of quantitative impacts of management alternatives affecting coal production assumes no new subsurface leasing would occur in PHMA/mapped GRSG habitat in SGMAs/core areas under Alternatives E1 and E2 management alternatives, even though the alternatives do not necessarily preclude leasing of subsurface minerals

Implementing management actions for the following resources or activities would have negligible social or economic impacts on the targeted economic sectors and are therefore not discussed in detail: ACECs, wild horses, Emergency Stabilization and Rehabilitation, and habitat restoration.

As a landscape level planning effort, none of the alternatives prescribe project-level or site-specific activities on BLM-administered or National Forest System lands. Furthermore, the agencies' selection of an alternative does not authorize funding to any specific project or activity nor does it directly tie into the agencies' budgets as appropriated annually through the Federal budget process. Consequently, agencies' costs and differences in program costs across

alternatives have not been quantified. Information has been presented in several resource impact sections on the types of costs that might be associated with various GRSG conservation measures.

4.23.3 Economic Impacts

Impacts from Management Actions Affecting Grazing Allotments

Economic impacts for grazing are quantified for Alternatives C1 and C2 where grazing would not be available in all or portions of GRSG habitat. Impacts for all alternatives are qualitatively discussed for other types of restrictions or RDFs that are contingent upon proximity to lek areas and/or meeting desired range conditions.

Overall Employment, Earnings, and Output per Job Impacted by Management Alternatives

The potential impacts of grazing closures on overall grazing employment, earnings, and output were estimated quantitatively. Under Alternatives B, D, and E, and the Proposed Plans, GRSG habitat would remain available for livestock grazing; impacts would be similar to Alternative A. Additionally, under the Proposed Plans, livestock grazing may need to be adjusted in order to meet Land Health Standards and to conserve, enhance, or restore GRSG habitat based on specific GRSG habitat objectives. This could result in local economic impacts that cannot be quantified at this time. Alternative C offers two options for management of grazing: C1 and C2. Under Alternative C1, grazing would not be allowed in GRSG habitat on federal lands. Under Alternative C2, 40 percent of the GRSG habitat on federal lands would no longer be available for grazing.

The economic impact of Alternatives C1 and C2 reflect the removal of all or some of the GRSG occupied habitat from availability for grazing. State and private lands used for grazing and surrounded by federal lands could also be affected by Alternatives C1 and C2, although the effect may differ from one property to another. In some cases, state and private land surrounded by federal lands with GRSG habitat may no longer be used for grazing as well, if livestock operators in those lands depend on the surrounding federal lands for the viability of their operations. In others, the presence of state and private lands may reduce impacts of C1 and C2 on grazing, if livestock grazing is shifted from federal to state or private lands.

Estimates for 1 year were obtained using the IMPLAN model. Billed AUMs better reflect the economic impact than active AUMs in any given year. However, billed AUMs fluctuate from one year to another and are partially dependent on operator decisions. BLM and Forest Service management directly affects active AUMs. Estimates are presented below for the impact of alternatives based on data for billed AUMs, but the range of potential impacts is discussed.

Further details are provided in **Appendix W**. **Table 4.49** presents the estimates for impacts by alternative, relative to Alternative A. Employment estimates do not include family labor and may, therefore, underestimate labor use differences among alternatives.

Under Alternatives B, D, and E, and the Proposed Plans, the average annual earning per job supported by livestock farming on federal lands would be estimated to be approximately $32 thousand (**Appendix W**). A qualitative discussion of other potential impacts under Alternatives B, D, and E, and the Proposed Plans is provided below.

Table 4.49
One Year Impact of Management Actions Affecting Grazing on Output, Employment, and Earnings by Alternative, Relative to Alternative A (2011 $)

	Alternatives B, D, and E, and Proposed Plans[1]	Alternative C1	Alternative C2
Primary Study Area			
Output (2011 $)	$0	-$52,815,545	-$21,126,218
Employment	0	-608	-243
Earnings (2011 $)	$0	-$17,638,438	-$7,055,375
Primary and Secondary Study Area			
Output (2011 $)	$0	-$56,895,219	-$22,758,087
Employment	0	-634	-254
Earnings (2011 $)	$0	-$18,632,089	-$7,452,836

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Alternatives B, D, and E, and the Proposed Plans do not identify areas as unavailable for grazing

Under Alternative C1, GRSG occupied habitat on federal lands would no longer be available for grazing. This alternative would remove approximately 329,671 active AUMs from BLM field offices and approximately 264,229 active AUMs from National Forests in the primary study area (**Appendix W**). Assuming this removal of active AUMs would result in the loss of all billed AUMs in the allotments made unavailable for grazing; 391,687 billed cattle AUMs would be lost and 100,829 billed sheep AUMs would be lost. The resulting impact is estimated in a loss of approximately $53 million per year in output, 608 jobs, and approximately $18 million in labor earnings. These impacts are derived by multiplying the AUMs by alternative (shown in **Table W.1** of **Appendix W**) by the impacts per AUM shown in **Tables W.2** and **W.3**.

Under Alternative C2, approximately 40 percent of the GRSG occupied habitat on federal lands would no longer be available for grazing. **Table 4.49** illustrated these lesser reductions in AUMs when compared with Alternative C1. The resulting impact is estimated in a loss of approximately $21 million per year in output, 243 jobs, and approximately $7 million in labor earnings.

Under both Alternatives C1 and C2, the impact could be larger if livestock operations have no reasonable alternative to seasonal grazing on public lands. Livestock grazing on federal lands is often done during the spring and summer seasons, with other feeding alternatives (hay) being used during fall and winter. If there are no other options for grazing federal lands during spring and summer, operators may need to reduce their operations and the resulting loss of output, jobs and earnings would be larger than currently estimated. Torell et al. (2014) provides estimates of the potential impacts on model ranches in Idaho, Nevada, Oregon, and Wyoming of seasonal closures of federal lands for livestock grazing. The estimates are based on an economic model that assumes operators respond to the loss of availability of federal lands for grazing in several ways to maximize their profits (gross margins), including reducing the size of their operations. In this case, the socioeconomic impact of closures of federal lands to grazing are larger than the estimates based only on the loss of spring and summer AUMs. Although an estimate is not available for a typical farm in Utah, estimates for other states suggest the loss of AUMs may be just slightly larger than currently estimated in cases where only a small share of

federal lands are unavailable for livestock grazing, or may be several times larger in cases where livestock farms find it in their best interest to close operations. This may be more likely the case for smaller operations.

Under Alternative C2, the impact may also be lower. Billed AUMs can vary greatly as a share of active AUMs from one management area to another and from one year to another. Given the difference between active and billed AUMs, livestock operators may be able to absorb some of the loss in active AUMs by billing a greater proportion of the active AUMs remaining under Alternative C2 (i.e., the percent difference between current billed versus active AUMs can be credited toward meeting the 40 percent reduction). This is less likely the case on National Forests than on BLM-administered lands, since allotments on National Forests tend to have billed AUMs closer to active AUMs. The difference between a) current billed AUMs under Alternative A and b) billed AUMs under Alternative C2 when the operator sets billed AUMs to equal Active AUMs, would likely constitute a lower bound to impacts under Alternative C2. This response from livestock operators would not be possible under Alternative C1, because all allotments with GRSG habitat would be closed to livestock grazing.

Under the Proposed Plans, the BLM would use the assessment and monitoring data related to habitat objectives to evaluate whether rangeland health standards, are being met. The Forest Service would use Seasonal Habitat Desired Conditions for GRSG and Grazing Guidelines for GRSG seasonal habitat. If rangeland health standards are not being met, adjustments to livestock grazing would be implemented at the allotment level, and may include a variety of management approaches, such as changing rotation systems, season or timing or use, distribution of livestock use, intensity of use, type of livestock, class of livestock (e.g., yearlings vs cow-calf pairs), duration of grazing use and rest period or stocking rates. It is unknown to what extent permittees may need to change livestock management, and what economic costs those changes might entail. In general, there may be some increased costs to implement management when it is identified that livestock management is conflicting with meeting GRSG habitat objectives. Because the BLM takes a collaborative, site-specific approach to modifying livestock grazing, permittees are afforded the opportunity to work with the BLM to develop management approaches that minimize impacts on their operations, while addressing identified habitat issues. Some permittees may prefer to reduce grazing overall, while others may prefer to increase management inputs (e.g., herding or maintaining let-down fences) to prevent a reduction in their authorized use, when provided with more than one viable alternative towards meeting rangeland health standards and GRSG habitat objectives. The Proposed Plans allows for design and implementation of allotment-specific management that would meet GRSG habitat objectives appropriate for each area, while providing the flexibility to minimize economic impacts on operators, rather than implementing a blanket reduction in grazing, which may provide benefits in some areas, while unnecessarily inflicting economic impacts in areas where ongoing management is resulting in satisfactory on-the-ground habitat conditions for GRSG.

As with the Proposed Plans, the other alternatives could impose costs on livestock operators beyond the closures of federal land to grazing. In particular, management alternatives could impose the following costs:

- For Alternatives B, D, and E, and the Proposed Plans, in habitat or active lek areas during certain seasons (e.g., nesting or breeding seasons) where desired conditions for GRSG are not being met, seasonal modifications to grazing management strategies may be needed (e.g., changes in pasture rotation or fencing), implying potential for increased costs and/or reductions in AUMs for some allotments; potential for impacts is greater for Alternatives B and D and the Proposed Plans, relative to Alternative E. As an example, changes in the areas available for pasture, fencing, or interruptions of cattle paths could increase distances for cattle movement, need for alternative water sources, and associated costs. Additional Forest Service guidelines for habitat (e.g., 7-inch stubble height for nesting habitat) may increase potential for impacts for some permittees, depending on specific conditions on allotments.
- For Alternatives B, D, and E, and the Proposed Plans, location of water developments and design of structural range improvements must have a neutral or beneficial effect on GRSG, while fences may need to be removed, modified, or marked based on proximity to lek areas, implying potential for increased costs; this potential is relatively greater for Alternatives B and D and the Proposed Plans, compared to Alternative E.

These impacts could occur under Alternatives B, D, and E, and the Proposed Plans, even though the areas available for livestock grazing would be the same as those under Alternative A. Conditional reductions in forage allocated to livestock (AUMs) may occur in combination with, or as an alternative to implementing grazing management modifications or design features.

In summary, unconditional reductions in AUMs and potential increases in costs are greatest under Alternative C1, followed by Alternative C2. Reductions in AUMs under Alternatives B, D, and E, and the Proposed Plans are conditional on rangeland meeting seasonal desired conditions. Consequently, the likelihood of AUM reductions and potential for increased costs under Alternatives B, D, and E, and the Proposed Plans are substantially lower than Alternatives C1 and C2. The relative potential for increased costs from implementing conservation measures and design features could be slightly higher for the Proposed Plans, followed by Alternatives B and D, followed by Alternative E.

Map 3.16-1 shows the location of BLM and Forest Service grazing allotments where GRGS habitat exists. Almost all counties would be impacted by the loss of grazing allotments with GRSG habitat under Alternatives C1 and C2. The areas least affected would be the northern area of Cache, Morgan, Summit and Wasatch counties (although Tooele, Box Elder, and Rich would be affected), and the center east area of Emery, Grand, and Wayne counties.

Table 3.125 shows that farm earnings in 2010 constituted over 2 percent of total earnings in Beaver, Box Elder, Iron, Juab, Piute, Rich, Sanpete, and Wayne counties. The same table shows that in all of these counties, livestock operations are an important share of farm cash receipts. In

some cases, a considerable share of farm earnings and farm cash receipts from livestock may reflect hog and pig operations rather than grazing livestock (e.g., Beaver and Iron counties). The intersection of these counties with the set of counties where there are grazing allotments with GRSG habitat indicates counties where economic impacts of management alternatives through livestock grazing may be of particular importance. These counties are Box Elder, Juab, Piute, Rich and Sanpete and possibly Beaver and Iron counties[3] (see **Table 1.2** and **Map 1.1**).

Other Values Associated with Livestock Grazing

As described in **Chapter 3**, public land managed for livestock grazing provides both market values and nonmarket values; the latter include open space and western ranch scenery, which provide value to some residents and outside visitors, and ranches may provide some value to the nonusing public (e.g., the cultural icon of the American cowboy). Some of the lifestyle value of ranching is likely to be captured in markets (e.g., property values of ranches adjacent to public lands). Other residents and visitors may perceive nonmarket opportunity costs associated with livestock grazing. The "Other Values" section in the Social and Economic Conditions (Including Environmental Justice) section of **Chapter 3** and **Appendix U**, Non-Market Valuation Methods, provide additional discussion of these values. Overall, the process for incorporating potential nonmarket values associated with the management of public land for livestock grazing into analyses of net public benefits remains difficult as it implies the need to consider nonmarket values and uses associated with landscapes characteristics and opportunities that would exist in absence of grazing and ranch activity (i.e., nonmarket values and benefits from alternative landscapes may help offset potential losses in nonmarket values linked to grazing and ranching).The BLM and Forest Service do not attempt to quantify these values for the present study.

To the degree that there are net benefits associated with nonmarket values attached to livestock grazing and ranching, these would be similar in Alternatives A, B, D, and E, and the Proposed Plans as all of these alternatives are likely to result in similar levels of livestock grazing operations in the study area (although differences among these alternatives do exist and are discussed above). If the net nonmarket value associated with livestock grazing and ranching is positive, then that value would be lower under Alternatives C1 and C2, in line with the market impacts discussed immediately above.

Under Alternatives A, B, D, and E, and the Proposed Plans, the economic viability of livestock grazing and ranching activities would continue on current trends, with some differences among these alternatives, as previously discussed. To the degree that there is a positive net nonmarket value associated with livestock grazing and ranching, and to the extent that economic viability is critical for keeping the lands in ranching, those values would be more likely to be preserved.

Under Alternative C1, the removal of AUMs on occupied habitat within federal lands would result in a substantial reduction in forage availability on federal lands, which may adversely affect ranching activity. This could, in turn, result in impacts on any nonmarket values associated with

[3] A large hog and pig operation, Circle Four Farms, is located in Beaver and Iron counties. The 2012 agricultural census does not contain information on hog and pig inventory or sales in these two counties to avoid disclosure of data for individual farms.

keeping lands in ranching. These impacts, if any, would be greater in Alternative C1 than C2, in accordance with the greater reduction in AUMs in Alternative C1. Nonmarket benefits linked to alternative landscapes and land uses may help offset potential losses in nonmarket benefits associated with grazing.

Impacts from Management of Oil and Gas Leases

Overall Employment, Earnings, Output, and Earnings per Job Impacted by Management Alternatives
The potential impacts of management alternatives affecting oil and gas drilling, completion, and production on overall employment, earnings, and output were estimated quantitatively using the IMPLAN models for (1) the primary social/economic study area and (2) a smaller three-county area, representing a majority of oil and gas activity. Both wells drilled on new and existing leases on GRSG habitat projected for a future 15-year horizon were considered. Existing wells would not be impacted by GRSG habitat management alternatives. Projections were based on current RFD scenarios (see **Appendix W** for more details).

Results for the primary and secondary social and economic study areas are presented in **Table 4.50** and **Table 4.51**. These results were derived by multiplying the numbers of wells drilled and completed and production by alternative (shown in **Tables W.4** and **W.5** of **Appendix W**) by impacts per well and per unit of production (shown in **Tables W.6** through **W.11**) It was assumed that new leases on state and private lands intersecting GRSG habitat would be affected similarly to federal lands, if large areas of contiguous decision area lands are closed to new oil and gas leasing. The difference between the impacts on all lands and those on federal lands is a measure of the impacts on state and private lands and includes state trust lands that could be impacted by the lack of lessee access to blocks of sufficient size for oil and gas development. Adverse impacts on oil and gas development on state lands would also affect state collections associated with royalties and severance taxes.

As noted in **Appendix W**, because IMPLAN incorporates regional trade data, it is able to separate the economic impact received by a specific region from the impact that is felt beyond the selected geographic area. In the case of oil and gas, for example, most of the production revenue does not accrue to residents of the study area and are, therefore, not included in the earnings estimates.

Under Alternative A, current management of sensitive habitats, including that of the GRSG, would continue. Compared with the action alternatives and the Proposed Plans, current management would result in the highest level of oil and gas related output, employment, and earnings. The average annual earnings per job supported by the oil and gas sector would be estimated to be approximately $52 thousand (**Appendix W**).

Alternative B designates some mapped GRSG occupied habitat as PHMA and would no longer permit drilling and oil and gas production in PHMA. This alternative would likely affect some counties more than others. Of the counties where most of the drilling is forecast to occur in the next 15 years, Carbon and Duchesne counties would likely see a considerable reduction in wells drilled under new leases, but the reduction would be less pronounced in Uintah County. In total, Alternative B would be estimated to result in $83 million less output per year, 271 fewer

Table 4.50
Average Annual Impact of Management Actions Affecting Oil and Gas on Output, Employment, and Earnings by Alternative, Relative to Alternative A – Federal Fluid Minerals

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Primary Study Area					
Output (2011 $)	-$68,561,048	-$187,598,612	-$29,345,540	$0	-$30,774,675
Employment[1]	-202	-508	-6	0	-14
Earnings (2011 $)	-$10,318,378	-$26,005,854	-$382,870	$0	-$811,820
Primary and Secondary Study Area					
Output (2011 $)	-$74,247,139	-$202,481,630	-$30,550,971	$0	-$32,163,745
Employment[1]	-236	-598	-13	0	-23
Earnings (2011 $)	-$12,080,275	-$30,625,859	-$773,948	$0	-$1,258,876

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Table 4.51
Average Annual Impact of Management Actions Affecting Oil and Gas on Output, Employment, and Earnings by Alternative, Relative to Alternative A - Federal, State, and Private Fluid Minerals

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Primary Study Area					
Output (2011 $)	-$82,584,253	-$218,801,958	-$33,598,577	$0	-$31,756,853
Employment[1]	-271	-653	-25	0	-14
Earnings (2011 $)	-$13,847,839	-$33,383,657	-$1,399,957	$0	-$872,208
Primary and Secondary Study Area					
Output (2011 $)	-$89,863,721	-$237,087,316	-$35,270,113	$0	-$33,196,455
Employment[1]	-315	-764	-36	0	-23
Earnings (2011 $)	-$16,098,094	-$39,047,236	-$1,934,484	$0	-$1,337,297

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

jobs, and almost $14 million less in annual earnings, when compared with Alternative A, in the primary study area (**Table 4.51**).

Management under Alternative C would have the most economic impacts through restriction on oil and gas drilling and production. Under Alternative C, all mapped occupied habitat on federal lands would be designated PHMA and would be unavailable for new oil and gas exploration. Additional output and employment generated by new production on state and private lands in GRSG habitat could also be affected. Alternative C would be expected to result in approximately $219 million less output per year, 653 less jobs and $33 million less in annual earnings, when compared with Alternative A (**Table 4.51**). Counties most affected would again be Carbon and Duchesne counties. As shown in **Table 3.127**, these are counties where an estimated 14 percent and 16 percent of total employment are in the mining sector.

As in the case of Alternative B, Alternative D would designate some mapped occupied habitat as PHMA. However, PHMA would not necessarily be made unavailable for drilling and oil and gas production, but rather an NSO stipulation would not allow development within 4 miles of an occupied lek (with waivers, exceptions, and modifications). In addition, CSU and/or TL stipulations would apply to all areas within occupied habitat that are outside a lek buffer. Alternative D would be expected to be considerably less restrictive than Alternative B. Alternative D would be estimated to result in approximately $34 million less output per year, 25 less jobs and $1.4 million less in annual earnings, when compared with Alternative A (**Table 4.51**).

Alternative E1 is based on the State of Utah's *Conservation Plan for Greater Sage-grouse in Utah*. This plan imposes minor constraints to use of GRSG habitat and BLM and Forest Service do not anticipate that this alternative would result in changes in oil and gas development, when compared with Alternative A.

The Proposed Plans would apply NSO stipulations to all new fluid minerals leases in PHMA. Subject to valid existing rights, future development on existing leases may be subject to additional RDFs in PHMA. Oil and gas development in GHMA would be subject to net conservation gain requirements, RDFs and buffers around leks. The Proposed Plans would be expected to have impacts similar to those of Alternative D and would be estimated to result in approximately $32 million less output per year, 14 fewer jobs and $0.9 million less in annual earnings, when compared with Alternative A (**Table 4.51**).

Public comments to the Draft LUPA/EIS expressed concern with potential impacts on communities within the planning area. Under all alternatives, impacts of oil and gas development are expected to be felt considerably on the counties of Duchesne, Carbon, and Uintah. These three counties have 96 percent of the new wells projected for the Utah study area and 92 percent of those expected to be affected by management alternatives. In addition, Vernal is a city with service providers to the oil and gas industry and is located in Uintah County. The BLM and Forest Service estimated the impacts on these three counties assuming all direct impacts would fall within their borders, and using IMPLAN modelling and resulting multipliers specific to this three-county area (see **Appendix W** for details). The results are shown in **Table 4.52**, Average Annual Impact of Management Actions Affecting Oil and Gas on Output, Employment, and Earnings by Alternative, Relative to Alternative A – Three County Area.

Table 4.52 shows that employment losses in the three counties would correspond to up to 1.5 percent of the employment in those three counties in 2010 under Alternative C (614 divided by 42,013, per **Table T.1** in **Appendix T**, Detailed Employment and Earnings Data). Employment losses under Alternatives B and D, relative to Alternative A, would correspond to less than 1 percent of the 2010 employment levels in those three counties.

Table 4.52
Average Annual Impact of Management Actions Affecting Oil and Gas on Output, Employment, and Earnings by Alternative, Relative to Alternative A – Three County Area

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Federal Fluid Minerals					
Output (2011 $)	-$67,562,191	-$185,252,920	-$29,650,802	$0	-$31,020,342
Employment[1]	-190	-480	-9	0	-17
Earnings (2011 $)	-$10,291,425	-$25,934,176	-$396,576	$0	-$823,681
Federal, State and Private Fluid Minerals					
Output (2011 $)	-$81,133,615	-$215,527,170	-$33,781,803	$0	-$32,029,449
Employment[1]	-253	-614	-27	0	-17
Earnings (2011 $)	-$13,813,574	-$33,291,649	-$1,415,413	$0	-$901,643

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Impacts from Management of Coal Leases

Overall Employment, Earnings, Output, and Earnings per Job Impacted by Management Alternatives
The potential economic impacts of management of coal leases were estimated quantitatively using IMPLAN. Assumptions regarding projected production of coal, share of production from federal mineral lands and price of coal are detailed in **Appendix W**. **Table 4.53** shows the estimated economic impacts. These estimates were obtained by multiplying coal production by alternative (shown in **Table W.11** of **Appendix W**) by impacts by unit of production (shown in **Tables W.12** and **W.13**).

Table 4.53
Average Annual Impact of Management Actions Affecting Coal Production on Output, Employment, and Earnings by Alternative, Relative to Alternative A, 2014-2028

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Primary Study Area					
Output (2011 $)	-$151,942,680	-$202,521,295	$0	$0	-$28,922,313
Employment[1]	-563	-765	0	0	-91
Earnings (2011 $)	-$35,970,600	-$48,707,572	$0	$0	-$5,977,846
Primary and Secondary Study Area					
Output (2011 $)	-$179,903,288	-$241,212,017	$0	$0	-$32,624,281
Employment[1]	-715	-975	0	0	-111
Earnings (2011 $)	-$44,469,836	-$60,478,647	$0	$0	-$7,091,537

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Under Alternative B, some mapped occupied habitat would be designated as PHMA and no new leases for coal production would be allowed in PHMA. It is expected that underground coal production would be up to 14 percent less under Alternative B when compared with Alternative A. In addition, the assumption was made for analysis purposes only that surface coal production from the Alton coalfield would no longer enter production. The result would be a decrease relative to Alternative A of almost $152 million of estimated coal related output, 563

jobs and about $36 million in coal related earnings. For both underground and surface coal production, it should be emphasized that the figures here overstate the likely reductions. They overstate likely reductions for the Alton coalfield (i.e., surface coal production) because some portion of the Alton formation could still be accessed underground. They also overstate likely reductions for underground coal production because nothing in this alternative would preclude leasing of subsurface materials. The calculations here assume that no new subsurface leasing would occur in PHMA, and thus represent a worst-case scenario for this alternative.

Under Alternative C, all mapped occupied habitat would be closed for new leases of federal coal production. It is expected that underground coal production would be up to 21 percent less under Alternative C when compared with Alternative A. As in the case of Alternative B, the assumption was made for analysis purposes only that surface coal production from the Alton coal field would not enter production under Alternative C, based on the same idea as in Alternative B (i.e., that new leases would include restrictions on surface occupancy for vents, ports, loading facilities, and other infrastructure requirements that may occur on occupied habitat). The result would be a decrease relative to Alternative A of almost $203 million of estimated coal related output, 765 jobs and about $49 million in coal related earnings. For both underground and surface coal production, it should be emphasized that the figures here overstate the likely reductions. They overstate likely reductions for the Alton coalfield (i.e., surface coal production) because the necessary infrastructure could be developed on state or private land. They also overstate likely reductions for underground coal production because nothing in this alternative would preclude leasing of subsurface materials. Similar to Alternative B, the calculations here assume that no new subsurface leasing would occur in occupied habitat, and thus represent a worst-case scenario for this alternative.

Under the Proposed Plans measures to protect GRSG and its habitat (disturbance cap, lek buffers, net conservation gain requirements, and restrictions on noise and season) could affect the feasibility of new underground coal leases or the expansion of existing underground operations (e.g., increased costs and development delays due to limits on the timing of activities) but would not preclude them. For analytical purposes, BLM assumed that all coal in the Alton coalfield would be accessible under the Proposed Plan, although largely by sub-surface methods due to the constraints of the conservation measures. The BLM assumed this would reduce the recovery rate from 90 percent to 45 percent and could have added costs for mining companies. The result would be a decrease relative to Alternative A of almost $29 million of estimated coal related output, 91 jobs and about $49 million in coal related earnings.

Utah depends largely on coal for electricity. However, because the local supply of electricity relies on an interconnected grid, reductions in coal leasing in the primary study area under management Alternatives B or C would not necessarily impact the price of electricity to state-wide and interstate local electrical energy consumers.

Public comments to the Draft LUPA/EIS expressed concern with potential impacts on communities within the planning area. Under all alternatives, impacts of coal development are expected to be felt mostly in those counties where expenditures associated to coal development and production occur. This includes expenditures with infrastructure, equipment, facilities, and operations, among others, as well as expenditures with suppliers and service

providers and expenditures by those earning income from coal related activities. Based on the location of coal fields, as described in the Social and Economic Impacts (Including Environmental Justice) section of **Chapter 3**, and information provided by BLM the socioeconomic specialists, the BLM and Forest Service defined an eight-county area where impacts from coal development would most likely be felt. This area includes the coal producing counties of Carbon, Emery, Sanpete, and Kane, as well as counties that could be expected to provide construction inputs, materials, transportation services and other supplies, and that are located within the primary or secondary study area. These include Sevier, Paiute, Garfield, and Millard (BLM 2014). Utah County was considered but not included, because it would disproportionately impact the results, given its large population and economy relative to the other counties. BLM and Forest Service estimated the impacts on these eight counties assuming all direct impacts would fall within their borders, and using IMPLAN multipliers specifically for this eight-county area. For details, see **Appendix W**. The results are shown in **Table 4.54**.

Table 4.54 shows that employment losses in the eight counties would correspond to up to 1.2 percent of the employment in those eight counties in 2010 under Alternative C (700 divided by 56,405, per **Table T.1** in **Appendix T**).

Table 4.54
Average Annual Impact of Management Actions Affecting Coal Production on Output, Employment, and Earnings by Alternative, Relative to Alternative A, 2014 – 2018, Eight-County Area

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Output (2011 $)	-$146,882,519	-$196,335,975	$0	$0	-$27,322,109
Employment[1]	-516	-700	0	0	-85
Earnings (2011 $)	-$35,264,443	-$47,740,134	$0	$0	-$5,873,288

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Impacts from Management of Phosphate Leases

As noted in the Minerals and the Social and Economic Conditions (Including Environmental Justice) section of **Chapter 3**, the one existing phosphate mining operation in the planning area is on nonfederal lands and would not be impacted by decisions in this LUPA. Two fringe acreage lease applications to expand operations onto federal lands have been submitted to the BLM. If leases are not issued prior to the issuance of a ROD for this LUPA, decisions in this plan could affect the feasibility of operations on federal lands. The three primary operators, JR Simplot, Utah Phosphate, and Strata Minerals, are currently producing or exploring on private lands or leases owned by the SITLA. The BLM estimates that under existing mining techniques and market volumes at the current JR Simplot operation north of Vernal, there would be sufficient reserves to keep the current operation in production through a planning horizon of 15 years.

There are also eight existing prospecting permit applications on federal minerals for phosphate. Strata Minerals, Inc. has identified 33.9 metric tons of measured and indicated resources, including areas covered by seven of the prospecting permit applications. They have also

identified another 27.1 metric tons of phosphate ore (P_2O_5) averaging a grade of 19.67 percent. As of October of 2014, there were no feasibility studies, full market studies or economic evaluations available (Norwest Corporation 2014). Mill site mining claims have been filed by JR Simplot. In public comment to the Draft GRSG LUPA/EIS, industry representatives stated that Alternatives B, C, and D would be likely to eliminate any additional phosphate development in the Vernal area, with a loss of associated jobs and tax revenues.

No RFD scenario for phosphate was prepared that quantifies current phosphate reserves on private and public lands and forecasts production of those reserves. In the absence of this information and any proposed plans for leasing and developing federal lands for phosphate, it is not possible to quantify potential economic impacts across alternatives over the planning horizon. However, the areas available for phosphate leasing vary by alternative and could result in economic impacts if any party does pursue phosphate leasing and development of federal minerals. These impacts would be more likely under Alternative C, which would close all federal mineral estate with phosphate potential to new leases, followed closely by Alternative B, which would close approximately 83 percent of the federal mineral estate in the decision area. Alternatives A and E would close the fewest acres. Alternative D would close most areas to surface mining but mostly allow underground mining (**Section 4.21.2**, Nonenergy Leasable Minerals).

Under the Proposed Plans, although PHMA would be closed to nonenergy mineral leasing, expansion of existing operations could be considered if the new lease is contiguous with an existing operation, and the new lease applies the pertinent management for discretionary activities in PHMA identified in MA-GRSG-3 (e.g., mitigation, disturbance cap, minerals/energy density, buffers, seasonal restrictions, and RDFs). Given the current situation of phosphate surface mining operations (surface mines), the potential that expansion of an existing mining operation could meet the disturbance cap at the project level would be low. Were mined areas sufficiently reclaimed to provide GRSG habitat, leasing and development could occur. However, since new or expanded leases must be adjacent to existing operations, the disturbance associated with the existing operation would generally result in an exceedance of the project-level disturbance cap. As such, given application of the disturbance cap at the project scale, the impacts on future phosphate leasing and development would likely be similar to Alternative D, with no potential new or expanded operations.

In summary, the Proposed Plans close nonenergy mineral development to new leases that are not contiguous to existing operations, and because it applies the 3 percent disturbance cap at the project level, this would likely preclude the expansion or development of phosphate mines onto public lands in PHMA. While existing mines are currently on nonfederal lands where development would remain, the Proposed Plans' management may alter mine development scenarios as the operators avoid public lands. While there may not be a loss of employment within the planning analysis period, there could be a loss of bonus bids, mineral royalties, taxes, and community support programs.

Locatable and Salable Minerals

The current locatable mining in GRSG habitat is relatively small compared to other mineral development as well as compared to locatable mining outside of GRSG habitat. Future

development trends of locatable minerals are expected to be similar to past development trends. For example, the vast majority of Utah's copper, gold and silver and all of the molybdenum is produced by Kennecott Utah Copper and is located outside GRSG habitat. Although, potential impacts on locatable mineral development are expected to be minimal (in terms of relative production and economic activity) across all alternatives, the potential impacts do differ across alternatives. In particular, Alternatives B and C recommend withdrawal from locatable mineral entry in PHMA and mapped occupied habitat, respectively. The Proposed Plans recommend SFA for withdrawal from locatable mineral entry and would have impacts more similar to Alternatives D and E. However, because more area would be recommended for withdrawal from locatable mineral entry, there is potential for a slightly greater impact under the Proposed Plans. The implications of these potential withdraws are explained in detail in **Section 4.21.4**, Locatable Minerals. Generally, these withdraws could affect a subset or all of the 39 locatable mining operations that occur on BLM-administered or National Forest System lands in GRSG occupied habitat as well as the claimants holding one of the over 2,500 claims. Any material changes to existing operations within a withdrawn area would require a validity examination. The claims would also be subject to a validity examination to determine if the claim is valid and prior to any development of the claim. Validity examinations typically cost at least $50,000 per claim to complete and have the potential to delay the start of locatable mineral development on a valid claim. In all the action alternatives where GRGS habitat would remain open, the BLM and Forest Service would work with claimants, to the extent possible by law, to minimize impacts on GRSG habitat, which could increase costs to the claimant.

Areas closed to mineral materials disposal would be the most under Alternative C, where no federal mineral estate within the decision area would remain open to mineral material disposal, and the least under Alternatives A and E, under which 98 percent of the federal mineral estate within the decision area would remain open. There are 4,008,600 acres of federal mineral estate in the decision area. Under Alternative D, 74 percent of federal mineral estate would be closed to commercial disposal and an additional 9 percent would be closed to both commercial and noncommercial disposal. Under the Proposed Plans, 83 percent of BLM-administered and National Forest System lands in GRSG habitat would be closed to new mineral material sales. In PHMA, there would be no new mineral material sites with the exception that existing pits could expand and remain open to free-use permits, consistent with the disturbance cap and other conservation measures (e.g., lek buffers, net conservation gain, and RDFs). The remaining 650,900 (17 percent) acres of GHMA would be open to new mineral material sites subject to the same conservation measures. Not all the acres closed have a high potential for saleable minerals. The impact of the Proposed Plans would be more similar to Alternative C than to Alternatives B or D.

Local and state governments often use mineral materials from federal mineral estate to construct infrastructure (i.e., roads). In areas where federal sources of mineral materials are closed to noncommercial disposal and no alternative public sources are available, local and state governments would likely face increases in costs associated to transportation of mineral materials for use in the construction of infrastructure. However, review of existing mineral material sites reveal that disturbed areas are smaller than the permitted areas. This suggests that additional material is already authorized and this plan would not impact those valid existing

rights. The cost of saleable minerals will increase due to the inability to access or comply with GRSG conservation measures.

Impacts from Management of Wind Energy Development

Overall Employment, Earnings, Output, and Earnings per Job Impacted by Management Alternatives
Current projections for wind energy in the primary study area forecast the installation of approximately 210 MW[4] of installed capacity in the near future. Under Alternative E, the expectation would be maintained. Based on GIS analysis, it is expected that intersection with GRSG occupied habitat would reduce the installed capacity under Alternatives B, C, and D, and the Proposed Plans to 121 MW. As described in the Renewable Energy section, while acres available for wind energy development vary greatly among these alternatives, the area of good or better wind potential does not vary greatly. **Table 4.55** and **Table 4.56** show the estimated impacts on output, employment and earnings. Average annual construction and operations impacts assumed installation of windmills would occur at a constant pace throughout a 15-year period. These estimates were obtained multiplying expected MW by alternative by impacts per MW (shown in **Tables W.15** and **W.16** of **Appendix W**).

Under Alternatives A and E, the output from the installation of wind energy would be estimated to be the same. The average annual earnings per job supported by the wind energy sector would be estimated to be between $41 thousand and $42 thousand (**Appendix W**).

Under Alternatives B, C, and D, and the Proposed Plans, the output from the installation of wind energy would be estimated to be reduced by almost $2.5 million per year and supporting employment would be estimated to be reduced by 15 annual jobs in the primary study area relative to Alternative A. During operations, annual output would be estimated to be reduced by an average of over $1 million annually and employment would be estimated to be reduced by an average of 13 annual jobs in the primary study area relative to Alternative A.

Public comments to the Draft LUPA/EIS expressed concern with potential impacts on communities within the planning area. Under all alternatives, the counties where most of the wind energy development expenses occur would also experience the majority of the associated economic impacts. This includes expenditures associated with infrastructure, equipment, facilities, and operations, among others, as well as expenditures by suppliers and service providers and expenditures by those earning income from coal energy activities. The 210 MW projection used above was based on expectations for Utah's west desert, particularly Millard County. Based on this projection and additional information provided by BLM socioeconomic specialists (BLM 2014), the BLM and Forest Service defined a two county area where impacts from wind energy development would most likely be felt. This area would include the counties of Millard and Beaver. (BLM 2014). Utah County was considered but was not included because it would disproportionately impact the results, given its relatively large population and economy. BLM and Forest Service estimated the impacts on these two counties assuming all direct impacts would fall within their borders, and using IMPLAN multipliers specifically for this two-county area. For details, see **Appendix W**. The results are shown in **Table 4.57**.

[4] MW: megawatts = one thousand kilowatts

Table 4.55
Average Annual Impact of Management Actions Affecting Wind Energy Development on Output, Employment, and Earnings by Alternative, Relative to Alternative A, Construction

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Primary Study Area					
Output (2011 $)	-$2,400,196	-$2,400,196	-$2,400,196	$0	-$2,400,196
Employment[1]	-15	-15	-15	0	-15
Earnings (2011 $)	-$625,808	-$625,808	-$625,808	$0	-$625,808
Primary and Secondary Study Area					
Output (2011 $)	-$2,765,778	-$2,765,778	-$2,765,778	$0	-$2,765,778
Employment[1]	-17	-17	-17	0	-17
Earnings (2011 $)	-$736,114	-$736,114	-$736,114	$0	-$736,114

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Table 4.56
Average Annual Impact of Management Actions Affecting Wind Energy Development on Output, Employment, and Earnings by Alternative, Relative to Alternative A, Operations

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Primary Study Area					
Output (2011 $)	-$1,029,635	-$1,029,635	-$1,029,635	$0	-$1,029,635
Employment[1]	-13	-13	-13	0	-13
Earnings (2011 $)	-$547,424	-$547,424	-$547,424	$0	-$547,424
Primary and Secondary Study Area					
Output (2011 $)	-$1,098,466	-$1,098,466	-$1,098,466	$0	-$1,098,466
Employment[1]	-13	-13	-13	0	-13
Earnings (2011 $)	-$568,425	-$568,425	-$568,425	$0	-$568,425

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Table 4.57
Average Annual Impact of Management Actions Affecting Wind Energy Production on Output, Employment, and Earnings by Alternative, Relative to Alternative A, Construction and Operations, Two-County Area

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Construction					
Output (2011 $)	-$2,186,134	-$2,186,134	-$2,186,134	$0	-$2,186,134
Employment[1]	-14	-14	-14	0	-14
Earnings (2011 $)	-$548,995	-$548,995	-$548,995	$0	-$548,995
Operations					
Output (2011 $)	-$954,183	-$954,183	-$954,183	$0	-$954,183
Employment[1]	-12	-12	-12	0	-12
Earnings (2011 $)	-$516,294	-$516,294	-$516,294	$0	-$516,294

Source: Calculated using the IMPLAN model as explained in the text and in **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Table 4.57 shows that employment losses in the two counties would be negligible when compared to the employment in those two counties in 2010 under Alternative C (12 compared to 10,432, per **Table T.1** in **Appendix T**).

Lands and Realty and Travel Management

Potential impacts from management actions affecting land and realty and travel management include increases in costs of construction of linear projects (e.g., roads and transmission lines).

To the extent that management alternatives require linear construction projects to avoid GRSG habitat or imposes additional construction requirements and constraints for projects crossing GRSG habitat, some impacts could affect the public. Alternatives B, C, and D would impose new ROW exclusions and reduction or alteration of designated corridor areas. The magnitude of this potential impact, in terms of miles of linear projects or total construction costs, could not be quantified since details of future linear projects are not known.

Under the Proposed Plans, there would be no new exclusion areas, and similar to Alternative E, the Proposed Plans would manage all PHMA as avoidance areas. Compared to Alternatives B, C, and D, this would allow ROWs to be placed within PHMA under certain conditions, which could reduce the potential cost of line construction. However, the conservation measures associated with the Proposed Plans are more restrictive than those under Alternative E, namely application of the disturbance cap, lek buffer distances, seasonal and tall structure restrictions, requirements to bury power lines if feasible, and the net conservation gain requirements. Thus, while the Proposed Plans do not designate any areas for "exclusion" to new ROWs, the avoidance criteria are sufficiently restrictive that many of the same effects as those identified under Alternatives B, C, and D would also be present, just to a potentially lesser degree (increased cost to new projects requiring placement of facilities in locations that may require additional miles of pipeline/power line to avoid lek buffers or otherwise to minimize impacts on GRSG). Additionally, applying other conservation measures that do not require full avoidance of an area could also result in spatial redesign of projects from preferred routes, or simply increase the cost of construction in a preferred location.

Public comments on the Utah Greater Sage-Grouse Draft LUPA/EIS demonstrated concern with impacts of increased cost of construction of transmission lines on energy ratepayers. Unit cost information for constructing transmission lines provides context for potential impacts on relocating or rerouting a transmission line. A 2012 Western Electricity Coordinating Council study provides information on transmission line costs per mile, ranging from $927 thousand to $2,967 thousand depending on voltage and whether lines are single or double circuit lines. The same study provides cost multipliers for difficult terrains, reaching up to 2.25 in the case of forested lands (Western Electricity Coordinating Council 2012). According to the Energy Information Administration, transmission costs account for approximately 11 percent of the cost of energy bills, with the remaining being formed by power generation and distribution (US Energy Information Administration 2013a). Because utility providers allocate costs on to their rate base, per customer rate impacts would be greater where the ratepayer base is smaller. Areas with smaller/local utility providers with fewer ratepayers would be required to absorb a greater proportion of the costs of relocation or rerouting compared to areas serviced by larger, multi-state providers.

Recreation

Quantifying or predicting changes in recreation use is more likely to be feasible for highly developed recreation areas. Quantifying or predicting changes in recreation in GRSG habitat in Utah is more difficult because primary recreational uses in GRSG habitat are more likely to be dispersed uses, such as hunting, driving for pleasure, general OHV use, car camping, and rock hounding. Baseline information on dispersed recreation within habitat areas is not available and thus precludes the quantification of potential changes to recreation use associated with management alternatives.

Under the management actions considered by the various alternatives, areas that would be closed to recreation activities, such as OHV travel, would not meaningfully affect how the public participates in the forms of dispersed recreation mentioned above, because the majority of the potentially affected recreation and travel management areas currently do not have mapped routes. In regards to access, recreation uses that rely on traveling cross-country in or on a motorized vehicle would no longer be allowed within PHMA. Action alternatives include measures that move BLM-administered lands designated as "Open" to cross country travel, to "Limited" to existing/designated routes within PHMA. National Forest System lands are already limited to designated routes and would be unaffected by the implementation of this management action. Changing area designations from "Open" to "Limited" would allow the BLM, Forest Service, and the State of Utah to mitigate habitat destruction by more effectively prosecuting those who drive cross-country and provide a management framework to most effectively develop implementation planning level comprehensive travel management plans. Completion of route mapping, verification and evaluation efforts in GSRG habitat would provide the appropriate level of information to develop more specific ranges of alternatives for transportation system which comply with agency laws, regulations and GRSG planning parameters resulting from these land use planning level range of alternatives.

The Proposed Plans place restrictive measures on SRPs issued within BLM-administered lands. In PHMA, only SRPs that have neutral or beneficial effects on GRSG and GRSG habitat would be issued. Existing SRPs would be evaluated to determine their effect on GRSG and GRSG habitat. SRPs determined to have adverse effects would be canceled or modified to avoid or mitigate effects of habitat alteration or other physical disturbances to GRSG (e.g., breeding, brood rearing, migration patterns, or winter survival). Permit stipulations that require the permittee to implement habitat restoration activities following the SRP event would be identified, and these restoration activities must be consistent with GRSG habitat objectives. New recreation facilities (e.g., campgrounds, trails, trailheads, staging areas) would not be constructed in PHMA, unless the development would have a net conservation gain to GRSG habitat (such as concentrating recreation, diverting use away from critical habitat area, etc.) or unless the development is required for visitor health and safety or resource protection.

Impacts from Management Actions Affecting Special Status Species

Other Values Associated with Populations of GRSG

As described in **Chapter 3**, economists and policy makers have long recognized that rare, threatened, and endangered species have nonmarket values composed of "use" values as well as economic values beyond those associated with active "use" through viewing or hunting.

Chapter 3 and **Appendix U** document current methods to estimate these "nonuse" values as a component of nonmarket values, including a description of the literature review that the BLM and Forest Service conducted to determine if there were existing nonmarket value studies for GRSG. Although there are no existing studies on valuation specific to the GRSG, several studies published in peer-reviewed scientific journals for bird species with similar characteristics find average stated willingness-to-pay between $15 and $58 per household per year in order to restore a self-sustaining population or prevent regional extinction (see **Appendix U** for details). These values represent a mix of use and nonuse values, but the nonuse components of value are likely to be large shares since the studies primarily address species that are not hunted, though many of these species are "viewed".

Since GRSG protection is a public good available to all households throughout the intermountain west, if similar per-household values apply and if even a small portion of the per-household value represents a nonuse value, then the aggregate regional nonuse value could be substantial. However, the BLM and Forest Service did not quantify the aggregate value because of several factors, including uncertainty associated with the comparability of the existing studies to the GRSG context and the documented difference between stated and actual willingness-to-pay.

From a qualitative perspective, however, the nonmarket benefits associated with populations of GRSG would be expected to be a function of the degree of habitat protection associated with each alternative. The potential impacts associated with each alternative are documented immediately below.

Current management, Alternative A, provides the least amount of protection for GRSG in the planning area and consequently could result in the most impacts on GRSG. As a result, management under Alternative A could have the greatest adverse impacts on GRSG nonmarket benefits.

Management under Alternative B provides a greater level of protection for GRSG than Alternative A but would provide a lower level of protection than Alternative C. To the degree that there are nonuse values associated with populations of GRSG, management under Alternative B would result in fewer adverse impacts on those values than Alternative A but more than in Alternative C.

Management under Alternative C would provide the most protection for GRSG. As a result, to the degree that there are nonuse values associated with populations of GRSG, management under Alternative C would have the least adverse impacts (or the most beneficial impacts) on those values.

Management under Alternative D would provide more protection for GRSG than Alternatives A or E but less protection than Alternatives B or C. To the degree that there are nonuse values associated with populations of GRSG, management under Alternative D would have greater adverse impacts on those values than Alternatives B or C, but fewer adverse impacts than Alternatives A or E.

Management under Alternative E would provide more protection for GRSG than Alternative A but less protection than Alternatives B, C, or D. To the degree that there are nonuse values associated with populations of GRSG, management under Alternative E would have greater adverse impacts on those values than Alternatives B, C, or D, but fewer adverse impacts than Alternative A.

Impacts on Tax Revenues and Payments to States and Counties

County fiscal revenues in the primary study area are described in **Chapter 3**. They include tax revenues, intergovernmental transfers (including payments in lieu of taxes), charges for services, licenses, and permits. The largest impact of management alternatives on county fiscal revenues would be through taxes paid by the oil and gas and coal sectors. Other potential impacts would be through property and sales taxes associated with the affected resources, including oil and gas, coal, grazing and wind energy. **Table 4.58** estimates federal royalty and state severance tax losses from decreased oil and gas production under each management alternative when compared with Alternative A. Although estimates are presented on an annual basis, they would accumulate over time (a 15-year period was used for the purposes of the socioeconomic analysis). For tax assessment purposes, which allow the deduction of certain production costs, production of both oil and gas was assumed to be valued at 87.5 percent of its market price.[5] State severance tax rates depend on production value but are 5 percent for production valued over a minimum amount (University of Utah, 2010). **Appendix W** shows the calculation details.

Table 4.58
Average Annual Federal Royalty and State Severance Taxes on Oil and Gas by Alternative Relative to Alternative A, Federal Fluid Minerals, 2011$

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Federal Royalties	-$4,687,184	-$43,302,127	-$3,394,550	$0	-$3,418,380
State Severance Tax	-$1,874,874	-$17,320,851	-$1,357,820	$0	-$1,367,352
Total	-$6,562,058	-$60,622,977	-$4,752,369	$0	-$4,785,732

Source: Calculated as explained in the text and in **Appendix W**.

Table 4.59 shows estimates for federal royalty losses from coal production in the primary study area under each Alternative, relative to Alternative A. As explained in **Appendix W**, the loss estimates for coal production under each Alternative are likely an upper bound. In addition, the royalty loss estimates shown below assume coal is valued as explained in **Appendix W**. In practice, the value of coal for royalty collection may be lower.[6] Utah does not have a state severance tax on coal.

[5] This was based on information available for the State of Colorado (Colorado Oil and Gas Association 2011). Valuation for Utah may be slightly above or below this number.

[6] In FY2012, the Office of Natural Resources Revenue reports coal royalty payments for the State of Utah in the amount of 6.9 percent of the sales value of coal, below the established rates of 8 percent for underground coal and 12.5 percent for surface coal (Office of Natural Resources Revenue 2013).

Table 4.59
Estimated Average Annual Coal Royalties in Primary Study Area, Relative to Alternative A, 2011$

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Sales Value ($)	-$110,121,635	-$146,301,599	$0	$0	-$21,505,292
Royalties ($)	-$10,509,008	-$13,403,405	$0	$0	-$2,688,161

Source: Calculated as explained in the text and in **Appendix W**.

As discussed in **Chapter 3**, federal mineral royalties and state severance tax are partially distributed to local governments. Other local revenue sources would also tend to decrease with less economic activity expected in the study area under Alternatives B and C when compared with Alternative A, with the least revenues expected under Alternative C. Real property tax revenues would be adversely impacted by less investments on federal lands related to oil and gas or coal. Municipal sales and use taxes would be adversely impacted by the decrease in sales, due to lower income being generated and spent. Fees for grazing on federal lands also partially benefit states and counties and the oil and gas and coal sectors generate additional revenues in the forms of lease bonus and rent payments. Under Alternative A, average annual federal royalty and state severance tax collections on new oil and gas leases on GRSG habitat and federal royalty collections on coal production are estimated to be highest. Other fiscal revenues are also estimated to be highest under Alternative A.

Under Alternative B, average annual federal royalty and state severance tax collections on new oil and gas leases on GRSG habitat are estimated to be approximately 68 percent of their levels under Alternative A. Federal royalty tax collections on coal production are estimated to be approximately 77 percent of their levels under Alternative A. Other fiscal revenues would be lower than under Alternative A.

Under Alternative C, no new oil and gas leases would be allowed on federal lands with GRSG habitat and some new oil and gas leases in GRSG habitat on state and private lands would also be affected, resulting in a loss of a little under $13 million, 100 percent of the amount estimated to be generated by these leases under Alternative A. Federal royalty tax collections on coal production are estimated to be approximately 71 percent of their levels under Alternative A

Under Alternative D, average annual federal royalty and state severance tax collections on new oil and gas leases on GRSG habitat are estimated to be approximately 75 percent of their levels under Alternative A. No federal royalty losses from coal production would occur under Alternative D.

Under Alternative E, average annual federal royalty and state severance tax collections on new oil and gas leases on GRSG habitat are estimated to be the same as under Alternative A. No federal royalty losses from coal production would occur under Alternative E.

Other potential fiscal impacts on local governments also exist from the choice of management alternative. Alternatives that restrict access to mineral materials from federal sources tend to increase the cost of public works through increased transportation costs for access to mineral

materials. Similarly, management alternatives that limit grazing may burden local wildfire departments and emergency responders if the occurrence of wildfires increases. In both these cases, impacts would be most likely under Alternative C and less likely under Alternatives A and E with Alternatives B and D in between.

4.23.4 Social Impacts

Impacts from Management Actions Affecting Migration

Population

The decrease in employment opportunities in the primary study area that would accompany Alternative C when compared with Alternatives A, D, and E is less than 1 percent of the employment base of the primary study area. This suggests impacts from management alternatives on population trends would be expected to be imperceptible in aggregate, even if potentially meaningful for specific counties and communities.

As previously noted, grazing, coal mining, oil, and gas are expected to be the economic activities generating most employment impacts from GRSG management alternatives. As previously argued, grazing related employment impacts would likely be most felt in Box Elder, Juab, Piute, Rich, and Sanpete, and possibly Beaver and Iron counties. The main area for underground coal mining is currently Carbon County (Price Field Office). Carbon County would also receive a substantial share of the impacts on employment through oil and gas drilling and production, recognizing that population shifts linked to mineral and energy development can be temporary and not representative of long-term trends. As shown in **Chapter 3**, Carbon County was the slowest growing county in the primary study area during the 1990 to 2010 period.

Under Alternative A, current management of GRSG habitat would continue and trends in population growth would not be affected by changes in management of GRSG habitat. Compared with Alternatives B, C, and D, and the Proposed Plans, this alternative has the lowest potential for impacts on population growth.

The potential for impacts on population trends from Alternative B is greater than Alternatives A, D, and E, and the Proposed Plans, but less than Alternative C. The potential is generated by impacts on employment from PHMA closed to economic activities, mostly oil and gas and coal development. Because the difference between employment opportunities under Alternative B when compared with Alternative A is 0.4 percent of the current employment in the primary study area, impacts on population are likely to be negligible.

Management under Alternative C has the greatest potential for impacts on population growth among the alternatives considered. The impacts would be expected to be largest in those counties and communities most reliant on grazing, coal, and oil and gas employment opportunities for income. Under this alternative the potential for impacts on population trends would be driven by projected employment changes of an estimated 0.8 percent of current employment in the primary study area; population shifts may therefore be relatively small or hard to detect. Shifts in population due to coal or oil and gas development may be temporary.

The impacts of Alternatives D and E and the Proposed Plans on population trends would be smaller than Alternatives B or C, given the estimated 0.1 percent impact or less on employment as a percent of current employment. Impacts would be expected to be the same as under Alternative A.

Housing and Public Services

Because the impacts of management alternatives on population are expected to be relatively small or negligible, with the possible exception of certain areas highly dependent on grazing and coal development and surrounded by GRSG habitat, impacts on housing and public services driven by changes in population trends are expected to be negligible.

Impacts from Management Actions Affecting Specific Groups and Communities

Consistency with County Land Use Plans

The decision under consideration will result in amended BLM and Forest Service management and LUPs throughout the primary study area. The BLM and Forest Service management and LUPs must be consistent with state and local LUPs to the extent possible, and amendments would aim to maintain this consistency. This would be the case under all alternatives.

Interest Groups and Communities of Place

As described in **Chapter 3**, there is a range of interest groups in the primary study area with overlapping and divergent interests. Groups centered on grazing, mining, oil and conservation of natural resources will be impacted differently by the management alternatives. Within these interest groups, more specific ones could be particularly affected. Among the interest groups most likely to be affected by the choice of alternative are those associated with wildlife conservation, and business groups associated with mining and grazing.

Public comments on the Draft LUPA/EIS expressed concern with impacts on individual counties and towns. Several commenters stated that the Draft LUP/EIS focused its description of the socio-economic impacts on the entire planning area but did not discuss in any detail the effects on individual communities. Specific communities will not be impacted in the same way by the management alternatives. Impacts depend on the extent to which communities are dependent on some of the economic activities impacted and on the extent to which GRSG habitat intersects with their economic activities. Small communities dependent on grazing or coal mining for their livelihoods may be impacted by alternatives to the degree that community residents are involved in activities located within or adjacent to GRSG habitat.

As previously noted, the counties of Box Elder, Juab, Piute, Rich and Sanpete draw important shares of their labor earnings from farming, receive important shares of their farming income from livestock operations and have considerable federal land used for grazing that intersect GRSG habitat. This may also be the case of individual communities in other counties. In addition, as discussed in the Social and Economic Conditions (Including Environmental Justice) section of **Chapter 3**, many people value the ranching lifestyle in excess of the income generated by the ranching operations. Several public comments on the Draft LUPA/EIS expressed that various aspects of rural lifestyles in the study area have a cultural value to the local population, including grazing, and requested that these cultural aspects be detailed in the socioeconomic section. Livestock farming is important culturally for many communities in the area. A recent ordinance

by Kane County, for example, argues that in the Escalante Region "livestock grazing practices have maintained their traditional culture, values, and heritage." (Kane County 2014). Closures and curtailed activity could result in disruptions and impacts on the economic contribution of livestock grazing in the local economy as well as the social fabric of the communities in which they operate.

It is expected that the counties of Duchesne, Carbon, and Uintah would be particularly impacted by management alternatives affecting development of oil and gas on federal lands. However, less than 1 percent of total employment in these counties is estimated to be impacted.

Based on the data presented in **Chapter 3** and **Appendix T**, Detailed Employment and Earnings Data, communities in the Alton mine area in Kane County do not appear to currently rely on mining for their livelihood.

Additional analysis will be needed during implementation of the management alternative chosen to properly assess the geographically localized impacts of management actions for which many of the public comments on the Draft LUPA/EIS expressed concern. For example, one commenter expressed concern with impacts on wind energy development, which would only be captures by a more localized analysis, including consideration of available ROWs for transmission lines. The potential impact of management alternatives on the development of wind energy and transmission line projects in specific localities would be analyzed during implementation of LUPs.

Alternative A would maintain current management and would, therefore, not change current incentives or restrictions to one or another interest group, nor would it change trends faced by individual communities.

Alternative B would limit economic activities in some areas intersecting with GRSG habitat. Management under Alternative B would have beneficial impacts on groups associated with wildlife conservation, as well as other interests indirectly affected by habitat protection.

Management under Alternative C would have adverse impacts on groups associated with grazing, oil and gas, wind development and coal mining. Alternative C would impose the greatest restrictions on business development interests and, as mentioned, could impact small communities whose livelihoods would be affected, such as small ranching communities surrounded by federally administered land that provides GRSG habitat. Management under Alternative C would have the most beneficial impacts on those groups associated with conservation interests, as well as other interests indirectly affected by habitat protection.

Impacts under Alternative D would similar to those of Alternative A, with some added restrictions to development in GRSG occupied habitat.

Impacts under Alternative E would be similar to Alternative A.

The Proposed Plans would be more beneficial to interests associated with wildlife conservation than Alternatives A, D, or E, but more beneficial to interests associated with oil and gas and coal than Alternatives B or C and more beneficial to grazing interests than Alternative C.

4.23.5 Summary of Economic and Social Impacts

As noted in the discussion of planning issues in **Chapter 1**, there is concern about how this action can promote or maintain activities that provide social and economic benefit to local communities while providing protection for GRSG habitat. Alternative actions evaluated in this FEIS consist of different packages of conservation measures that include land use restrictions, management practices or design features, habitat priorities or desired conditions, and monitoring protocols. Alternatives also specify different types and levels of mechanisms, such as disturbance caps, adaptive management protocols, and desired conditions or objectives, to guide when and where conservation measures, design features, and treatments are implemented. The overall effectiveness and efficiency of the alternatives depend on the degree to which these measures are targeted and prioritized in areas where habitat gains are most beneficial. These conservation measures, in aggregate, are intended to address threats to, and provide protection for GRSG (see **Chapter 2** of this FEIS). This section has evaluated the social and economic impacts resulting from conservation measures that address threats associated with specific land and resource uses (e.g., grazing and minerals) which are easily linked to social and economic conditions (e.g., employment). There are other conservation measures included in the alternatives (to varying degrees) that address other threats such as fire, invasive plants, and vegetation (e.g., pinyon-juniper) encroachment on GRSG habitat that will have direct impacts on local economies of communities. However, the extent of these impacts is not known at this planning stage and due to uncertainty (e.g., occurrence of fire). Therefore, while the regional economic impact of these conservation measure were not evaluated in this section, they will not only play a critical and complementary role in helping meet the goal of effectively protecting GRSG from a full spectrum of threats, but also support local economic activity.

The discussion and tables below summarize the range of potential social and economic impacts that may occur as a result of the subset of conservation measures that affect land or resource uses linked to readily identifiable social or economic conditions.

Table 4.60 and **Table 4.61** summarize the quantitative analysis of the potential effects of management alternatives on employment, earnings, and earnings per job in the primary study area. The socioeconomic impacts quantified are based on assumptions and best available data described as described in this section and in **Appendix W**. As a landscape level planning effort, a substantial amount of uncertainty exists regarding the magnitude, location, and nature of impacts on resource uses during implementation. To the extent feasible, the BLM and Forest Service provided localized information on impacts. In addition, the socioeconomic impacts quantified in this section do not exhaust all the possible socioeconomic impacts that could arise during implementation; especially, those impacts that would be associated with agency expenditures. These impacts may be of more or less importance to individual communities and will be analyze during implementation. The quantitative analysis included earnings and employment affected by management impacts on grazing, oil and gas, coal and wind energy, and these activities are expected to jointly capture the majority of the economic impact of the alternatives in the primary study area. Although estimates are presented on an annual basis, they would persist over time (a 15-year period was used for the purposes of the socioeconomic analysis). For the purpose of these tables, the numbers for grazing Alternative C1 were included. The impacts of oil and gas took into consideration impacts on federal, state, and private fluid minerals. Wind impacts include both construction and operations.

Table 4.60
Average Annual Impact on Employment and Earnings by Alternative, Relative to Alternative A, Primary Study Area

		Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Employment relative to Alternative A[1]	Grazing	0	-608	0	0	0
	Oil and Gas	-271	-653	-25	0	-14
	Coal	-715	-975	0	0	-111
	Wind	-28	-28	-28	0	-28
	Total	**-1,012**	**-2,262**	**-51**	**0**	**-153**
Earnings relative to Alternative A (2011$)	Grazing	$0	-$17,638,438	$0	$0	$0
	Oil and Gas	-$13,847,839	-$33,383,657	-$1,399,957	$0	-$872,208
	Coal	-$44,469,836	-$60,478,647	$0	$0	-$7,091,537
	Wind	-$1,173,232	-$1,173,232	-$1,173,232	$0	-$1,173,232
	Total	**-$59,433,524**	**-$112,616,591**	**-$2,515,806**	**$0**	**-$9,136,977**
Average Earnings Per Job Lost (2011$)	Grazing	NA	$29,011	NA	NA	NA
	Oil and Gas	$51,094	$51,124	$55,363	NA	$62,301
	Coal	$62,196	$62,029	NA	NA	$63,888
	Wind	$42,917	$42,917	$42,917	NA	$41,901
	Total	**$58,727**	**$49,786**	**$49,054**	**NA**	**$59,719**

Source: Impacts calculated using the IMPLAN model as explained in the text and **Appendix W**.
[1]Employment counted as a part-time or full-time position during a 1-year period.

Table 4.61
Average Annual Impact on Employment and Earnings by Alternative, Relative to Alternative A, Percent of 2010 Baseline

	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Employment relative to Alternative A	-0.4%	-0.8%	0.02%[1]	0.0%	-0.1%
Earnings relative to Alternative A	-0.6%	-1.1%	-0.02%	0.0%	-0.1%

Source: Impacts calculated using the IMPLAN model as explained in the text and **Appendix W**. Uses the baseline values for employment and labor earnings presented in **Table 3.120** and **Table 3.121**.
[1]-0.04 percent

Table 4.60 shows that the resources potentially affected by the choice of alternative are estimated to support an annual average of 2,262 fewer jobs under Alternative C when compared with Alternative A. Under Alternative C, approximately $113 million less in labor earnings would be generated annually, when compared with Alternative A. Alternative E would generate no changes in employment or labor earnings relative to Alternative A. Alternatives B

and D and the Proposed Plans would have an impact in between these two estimates, with the Proposed Plans supporting more jobs than Alternative D which in turn would support more jobs than Alternative B.

Table 4.61 shows that the resources potentially affected by the choice of alternative are estimated to correspond to a reduction in approximately 0.8 percent of the current employment in the primary study area under Alternative C, when compared with Alternative A. Based on **Table 4.60**, approximately 72 percent of the employment impacts would be attributed to impacts on oil and gas development and coal development with the remaining attributed mostly to grazing. Total earnings in coal mining would be more impacted considerably more because of the higher average earnings per job in that sector. Labor earnings potentially affected by the choice of alternative are approximately 1.1 percent of the 2010 earnings in the primary study area less than they would be under Alternative A. The higher potential impact on earnings than on jobs reflects the higher average earnings per job in the affected industries, when compared to the overall average in the primary study area. In particular, average earnings in jobs supported by the coal and oil and gas sectors are considerably higher than the average earnings per job in the study area.

As noted in **Section 4.23.2**, Methodology and Assumptions, economic impacts through the management of other resources are not expected to be substantially altered by the choice of alternative. This does not mean that there would be no impacts on those resources that have economic consequences. To the extent that leasing, travel or ROW restrictions affect individual economic activities, for example, they could impose increased costs to specific operators, whether associated with mining, grazing, or other economic activity. In addition, not all impacts of management alternatives through oil and gas, coal, wind energy and livestock grazing are reflected in the quantitative analysis. As previously discussed, various measures may have additional impacts that were not possible to quantify. For example, various management alternatives could have additional impacts on grazing through restrictions on movement of cattle, seasonal restrictions, impacts on rotation and other, as previously discussed.

In addition, counties will be impacted differently. As discussed above, Millard and Beaver counties would be expected to be most impacted by restrictions on wind development, Carbon, Duchesne and Uintah counties by impacts on oil and gas development, and larger groups of counties would be expected to be most impacted by grazing restrictions (Box Elder, Juab, Piute, Rich, Sanpete, and possibly Beaver and Iron counties) and coal restrictions (Carbon, Emery, Sanpete, Kane, Sevier, Piute, Garfield, and Millard counties).

Under current management, Alternative A, tax revenues are expected to be highest. Alternative B would generate less tax revenues than Alternative A. Alternative C would provide the least tax revenues. Alternative D and the Proposed Plans would generate tax revenues between Alternatives A and B. Alternative E would provide similar tax revenues as Alternative A.

Impacts from management alternatives on population trends would be expected to be generally not noticeable, with the possible exception of smaller communities highly dependent on grazing, coal mining, or oil and gas and whose activities intersect with GRSG occupied habitat. Interest groups revolving around conservation could experience greater benefits from Alternatives B and C. Communities with strong ties to livestock grazing, oil and gas, or coal mining would likely

benefit from Alternatives A, D, or E, or the Proposed Plans. Since many communities have both types of interest groups (and many more), the overall effects on specific communities with respect to interest group interests is difficult to predict.

Table 4.62 summarizes the social impacts of the management alternatives.

Table 4.62
Social Impacts

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Population growth; demand for housing and public services	Current trend, highest	Between A and C	Potential impacts on specific communities	Between A and B	Same as Alternative A	Between B and D
Consistency with county LUPs	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Impacts on interest groups and communities of place	Most benefit to extractive use interests	Between A and C	Most benefits to conservation groups	Between A and B	Same as Alternative A	Between B and D

Nonmarket benefits from this action will be derived from the ability of the full spectrum of conservation measures to conserve, enhance, and/or restore GRSG habitat by reducing, eliminating, or minimizing threats to GRSG habitat. Furthermore, as discussed, alternatives also specify different types and levels of mechanisms, such as disturbance caps, adaptive management protocols, and desired conditions or objectives, to guide when and where conservation measures, design features, and treatments are implemented and that will have an important influence on the overall effectiveness and efficiency of the alternatives. The magnitude of benefits associated with stabilizing or improving GRSG populations or habitat has not been monetized or quantified due to the absence of specific data on the values of nonmarket benefits of GRSG and uncertainty about quantifying projected responses of GRSG habitat and populations to conservation measures.

A qualitative evaluation of the benefits from potential changes in GRSG populations and habitat resulting from the subset of conservation measures addressing land and resource uses and extraction, as evaluated in this section, indicates alternatives have the following capability to protect or improve benefits from GRSG:

- Alternative A has the lowest capability.
- Alternative B has greater capability than A, but lower capability than Alternative C.
- Alternative C has the greatest capability.
- Alternative D has greater capability than A or E, but lower capability than B or C.

- Alternative E has greater capability than A, but less than Alternatives B, C, or D.
- The Proposed Plans have greater capability than A, D, or E but less than B or C.

In addition to the conservation measures directly associated with social or economic impacts considered in this section, other conservation measures address other threats (e.g., fire, nonnative plants, and encroachment) that also contribute to GRSG and GRSG habitat protection and corresponding benefits that are not addressed here. Consequently, for a complete description of potential improvements in GRSG habitat protection resulting from the full spectrum of conservation measures under each alternative, the reader is referred to effects summary tables provided in **Chapter 2**. Social and economic impacts cannot be considered in isolation or exclusive of other impact indicators discussed in this EIS.

4.23.6 Environmental Justice Impacts

The BLM and Forest Service considered information on the presence of minority and low-income populations (from **Chapter 3**) along with additional information, described in this section, to assess the potential for the alternatives to result in disproportionately high and adverse impacts on minority or low-income populations. Although conservation measures would be implemented consistently across all identified habitat, with no discrimination over particular populations, environmental justice guidance requires agencies to consider also whether their actions could unintentionally result in disproportionately high and adverse effects.

To help guide the analysis of potential environmental justice impacts, the BLM and Forest Service considered the information gathered in the Economic Strategies Workshop that was conducted in June 2012. That workshop was convened to identify public concerns related to potential social, economic, and environmental justice impacts that could result from the management alternatives. None of the public comments received during that workshop called out a specific concern related to minority populations.

The BLM and Forest Service also reviewed the scoping report to identify any comments related to environmental justice issues received in the scoping phase. No comments during the scoping period were identified raising concerns regarding potential impacts on minority and low-income populations.

Potential Impacts on Minority Populations

As discussed in **Chapter 3**, CEQ guidance identifies a community or a specific population group as a minority population when either: (1) minorities in the affected area exceed 50 percent of the total population; or (2) the percentage of minorities in the affected area is meaningfully greater than the percentage in the general population or appropriate unit of geographical analysis. Based on the description of minority presence in the primary study area in **Chapter 3**, and based on definitions in relevant guidance, no minority populations were identified in the primary study area. Smaller communities where minority presence is "meaningfully greater" than in the state as a whole, although not identified in **Chapter 3**, may, however, exist in the primary study area, given its large geographic coverage.

The extent to which existing minority populations are disproportionately impacted by high and adverse human health or environmental effects depends on the existence of high and adverse

human health or environmental effects from management alternatives on any of the resources analyzed, and whether minority populations are particularly vulnerable to these impacts or more likely to be exposed to such impacts. Adverse impacts of alternatives were identified under the various resources analyzed and are described in their respective sections of **Chapter 4**, Environmental Consequences.

Because of the following, the BLM and Forest Service concluded that there would be no disproportionately high and adverse impacts on minority population under the management alternatives considered:

- No minority populations were identified at the county level.
- Although small communities with meaningfully greater presence of minorities could exist in the primary study area, adverse impacts under any of the alternatives would not be restricted to small communities, but rather spread out in a broad region.
- No minority group is identified with the specific collection of activities that could be impacted by GRSG management (e.g., mining, oil and gas, grazing) and of these only grazing generates jobs with earnings lower than the average labor earnings in the primary study area.
- No pathways through which minority populations would be particularly vulnerable to the adverse impacts identified in **Chapter 4**.

Potential Impacts on Low-Income Populations

The presence or absence of low-income populations in the primary study area is discussed in **Chapter 3**. Of the 22 counties in the Socioeconomic Study Area, ten have a higher percentage of residents below the poverty line than the overall Utah percentage below the poverty line and four (Iron County, Beaver County, Sanpete county and Cache County) have a higher percentage of residents below the poverty line than the national percentage. It is also possible that that there are small communities that do constitute low-income populations, given the large geographic coverage of this EIS.

The BLM and Forest Service reviewed the impacts of alternatives described in the respective sections of **Chapter 4**.

Because of the following, the BLM and Forest Service concluded that there would be no disproportionately high and adverse impacts on low-income populations under the management alternatives considered:

- No adverse impacts were identified that would be disproportionately concentrated in Iron, Beaver, Sanpete, or Cache County.
- Although small communities with meaningfully greater presence of low-income groups could exist in the primary study area, adverse impacts under any of the alternatives would not be restricted to small communities, but rather spread out in a broad region.
- No low-income group is identified with the specific collection of activities that could be impacted by GRSG management (e.g., mining, oil and gas, grazing) and of these

only grazing generates jobs with earnings lower than the average labor earnings in the primary study area

- No pathways through which low-income populations would be particularly vulnerable to the adverse impacts identified in **Chapter 4.**

Table 4.63 provides a summary of environmental justice impacts.

Table 4.63
Environmental Justice Impacts

	Alternative					Proposed Plans
	A	B	C	D	E	
Disproportionately high and adverse impacts on minority populations	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Disproportionately high and adverse impacts on low-income populations	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact

4.24 TRIBAL INTERESTS

4.24.1 Methods and Assumptions

Indicators

The use of indicators in NEPA analysis should provide information on determining the extent or degree to which a tribal interest, resource, or setting is damaged, its physical integrity is lost, or its physical integrity is otherwise adversely affected by a proposed action. However, unlike cultural resources, which have legal criteria for determining the impacts, the impacts on areas or resources of tribal interest and the severity of impacts is dependent upon the perspective and context of the tribe or affected group. In other words, significant impacts would be determined by Indian tribes defining what is culturally or spiritually important to them. When assessing whether the action would have significant impact, the following level-of-effect indicators are carefully considered and consulted upon with tribal representatives:

- Magnitude: The amount of physical alteration or destruction that can be expected. The resultant loss of tribal value is not measurable in quantitative terms, but is described in qualitative summary.
- Severity: The irreversibility of an impact. Impacts that result in an irreversible and irretrievable loss of value are of the highest severity.
- Duration: The length of time an impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on tribal values.
- Range: The spatial distribution, whether widespread or site-specific, of an impact.

- Frequency: The number of times an impact can be expected. For example, an impact of variable magnitude and severity may occur only once. An impact such as that resulting from annual activities, such as road maintenance, may be of recurring or ongoing nature.

Assumptions

In addition to the assumptions in **Section 4.2.1**, this analysis includes the following assumptions:

- Native Americans or other traditional communities may have concerns about federal impacts on cultural resources, religious practices, or natural resource gathering that may occur because of federal actions. In cases where these concerns may be present, consultation would occur with the potentially affected Indian tribes.
- There may be areas of importance to contemporary Native Americans that are not readily identifiable outside of those communities.
- Consultation would continue with Indian tribes to identify any traditional cultural properties or resource uses and address impacts. Through this process, effects would be minimized or eliminated, although residual effects would be possible.

4.24.2 Alternatives Analysis

Types of impacts that could occur from management actions or their implementation under all alternatives include the following:

- Direct disturbance of locations or landscapes associated with trust or treaty assets, traditional beliefs, sacred sites, resource gathering areas, hunting and fishing areas, water sources, ancestral sites, human remains, and trails (similar to those described in **Section 4.12**, Cultural Resources)
- Alterations of visual and aural aspects of the cultural landscape's setting that would create changes to the landscape that make it no long useable by tribal members
- Increased access and human presence, which could lead to increased vandalism and unauthorized collection of ancestral sites or trespass on treaty areas
- Decreased tribal member access or interference with the exercise of treaty rights or cultural uses and practices, such as resource gathering or hunting
- The potential for erosion, pollution, habitat loss, and less-tangible changes to natural features and resources that tribal members may consider sacred

Any action that would impact the integrity of an Indian Trust Asset or treaty-based right of a tribe or tribal resource in the planning area would be considered an adverse effect on that resource, asset, or interest. Impacts can be caused by development (e.g., road construction) or conservation (e.g., habitat improvement or landscape reclamation) actions or future implementation actions. The BLM and Forest Service would continue to maintain government-to-government consultation with federally recognized Native American tribes and would consult with tribes during future implementation actions to assess case-by-case or project-by-project impacts.

Depending on the extent and type of activity, the amount of physical disturbance could be from slight visual or other intrusions on a landscape to wholesale destruction of an entire location or site. Whether impacts would affect a small portion of an area or affect a larger stretch of landscape would need to be evaluated by tribal representatives before making a determination on said impact's severity. However, it is usual to assume that impacts resulting in an irreversible and irretrievable loss of tribal value are of the highest severity. On a project-by-project basis, the spatial distribution (or range) of the disturbance would be largely focused on a site-specific basis. However, over time and as more actions occur throughout the planning area, the extent would be throughout sagebrush habitat.

Under all alternatives and the Proposed Plans, the BLM would continue to manage BLM-administered lands in a manner that accommodates Native American religious traditions, practices, and beliefs as guided by directives contained in BLM Manual 8120, American Indian Religious Freedom Act (42 USC 1996), Native American Graves Protection and Repatriation Act (25 USC 3001), Executive Order 13007 (Indian Sacred Sites), and Executive Order 13084 (Tribal Consultation), and Secretarial Order 3317, DOI Policy on Consultation with Indian Tribes (December 1, 2011). National Forest System lands are guided by Forest Service Manual 1500 (External Relations) and Forest Service Handbook 1509 (American Indian and Alaska Native Relations). All alternatives allow for the appropriate tribal governments to consult on a case-by-case basis on undertakings on BLM-administered and National Forest System lands that could affect Native American concerns. The BLM and Forest Service would continue to identify, protect, and preserve tribal assets, treaty rights, sacred/religious sites, or special use areas through site- and project-specific modification or mitigation on a case-by-case or project-by-project consultation basis that could affect Native American concerns.

Table 4.64 displays acres of tribal surface estate mapped as PHMA and GHMA under the Proposed Plans. Management actions tied to PHMA and GHMA would not be applied to tribal surface estate under any alternative because neither the BLM nor the Forest Service has discretion or authority to approve activities on these lands. However, anthropogenic disturbance on all lands (regardless of land ownership) must be taken into consideration when applying the Disturbance Cap Guidance (**Appendix E**). In cases where the BLM and Forest Service are reviewing new activities on public lands within PHMA and adjacent to tribal surface, existing disturbance on tribal lands would be taken into account if applicable.

Table 4.64
Mapped Tribal Surface Estate, Proposed Plans

Population Area	PHMA			GHMA		
	Total Surface[1]	Tribal Surface	Split Estate Minerals[2]	Total Surface[1]	Tribal Surface	Split Estate Minerals[2]
Uintah	566,800	16,200	0	991,500	353,200	43,200
Carbon	285,800	0	0	214,200	6,900	0
Ibapah	88,800	28,000	200	10,800	0	0
Strawberry	161,500	960	0	20,600	240	0
Statewide	**1,102,900**	**45,160**	**200**	**1,237,100**	**360,340**	**43,200**

Source: BLM 2015
[1]Acreage associated with total PHMA/GHMA polygon, regardless of land ownership.
[2]Acreage where the surface estate is owned by a Native American Tribe but that have a federal mineral estate.

4.25 UNAVOIDABLE ADVERSE IMPACTS

Section 102(C) of the NEPA requires disclosure of any adverse environmental impacts that could not be avoided should the proposal be implemented. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which there are no mitigation measures. Some unavoidable adverse impacts occur because of implementing the LUPA. Others are a result of public use of BLM-administered and National Forest System lands within the planning area. This section summarizes major unavoidable impacts discussions of the impacts of each management action (in the discussion of alternatives) and provides greater information on specific unavoidable impacts.

Planned activities would produce some level of air emissions, even with mitigation. However, none of the activities proposed in this LUPA/EIS would produce adverse impacts on the air quality resource, based on the definitions above.

Surface-disturbing activities would result in unavoidable adverse impacts. Although these impacts would be mitigated to the extent possible, unavoidable damage would be inevitable.

Permanent conversion of areas to other uses, such as transportation and mineral and energy development or OHV use, would be unlikely under all of the action alternatives. These would most likely decrease erosion and increase the relative abundance of species within plant communities, the relative distribution of plant communities, and the relative occurrence of seral stages of those communities. These activities would also intrude on the visual landscape. This type of development is most likely to occur under Alternative A. The other action alternatives place many restrictions on many types of development, which would most likely result in fewer visual intrusions and fewer instances of unavoidable wildlife habitat loss.

Unavoidable damage to cultural resources from permitted activities could occur if resources undetected during surveys were identified during surface-disturbing activities. In these instances, further impacts would be ceased on discovery of a resource, and the resource would be mitigated to minimize data loss. This scenario is most likely to occur under Alternative A since it would place the fewest restrictions on surface-disturbing activities. Unavoidable loss of cultural resources would also occur, due to nonrecognition, lack of information and documentation, erosion, casual collection, and inadvertent destruction or use. Broad-scale sampling and classification of areas with a high likelihood of containing cultural and resources would be expected to greatly reduce the probability of unavoidable adverse impacts on the resource.

Wildlife, livestock, and wild horses as well as other herbivores consume vegetation and impact soils through hoof action and possible compaction. When these impacts are kept at appropriate levels natural processes such as plant growth and recovery, freeze-thaw periods and microbial activity in the soil surface result in recovery from these impacts and maintain site stability and health. Vegetative treatments promoting recovery of GRSG would result in the destruction of the target species, be it annual grass, noxious weed, invasion juniper or changes in the age classes of a sagebrush stand. Some level of competition for forage between these species, although mitigated to the extent possible, would be unavoidable. Instances of displacement, harassment, and injury could also occur. These types of scenarios are most likely to occur under Alternative A. The other action alternatives would place restrictions on many development and

surface-disturbing activities, which would make the likelihood that displacement, harassment, and injury would occur to be much lower than Alternative A.

Recreation, development of mineral resources, and general use of the decision area would introduce additional ignition sources into the planning area, which would increase the probability of wildland fire and the need for its suppression. These activities, combined with continued fire suppression, would also affect the overall composition and structure of vegetation communities; this could increase the potential for high-intensity wildland fires. Restrictions on development under all of the action alternatives would be expected to decrease the potential for ignitions in the decision area.

As recreation demand increases, recreation use would disperse, creating unavoidable conflicts between recreation users, such as those seeking more primitive types of recreation, and motorized users sharing recreation areas. In areas where development would be greater, the potential for displaced users would increase. Under all of the action alternatives, restrictions on development would be expected to reduce the potential for displaced recreational users.

Numerous land use restrictions imposed throughout the decision area to protect GRSG habitat and other important values, by their nature, affect the ability of operators, individuals, and groups who use the public lands to do so without limitations. Although attempts would be made to minimize these impacts, unavoidable adverse impacts in the number and miles of roads or trails available for recreational use could occur under all of the action alternatives. Minimization would include limiting them to the level of protection necessary to accomplish management objectives and providing alternative use areas for affected activities.

4.26 Irreversible and Irretrievable Commitment of Resources

Section 102(2)(C) of NEPA requires a discussion of any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented. An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time (e.g., extraction of any locatable mineral ore or oil and gas). An irreversible commitment of a resource is one that cannot be reversed (e.g., the extinction of a species or loss of a cultural resource site without proper documentation).

Implementation of the LUPA management actions for all alternatives, except Alternative A, would result in fewer surface-disturbing activities, mineral and energy development, and ROW development that results in loss of irreversible or irretrievable resources.

Although new soil can develop, it is a slow process. Soil erosion or the loss of productivity and soil structure might be considered irreversible commitments to resources. Surface-disturbing activities, therefore, would remove vegetation and accelerate erosion, which would contribute to irreversible soil loss. However, many of the management actions in the LUPA are intended to reduce the magnitude of these impacts and to restore some of the soil and vegetation lost. Such disturbances would occur to the greatest degree under Alternative A, which would allow many more surface-disturbing activities, compared to the action alternatives.

Laws protecting cultural resources would mitigate irreversible and irretrievable impacts on cultural resources from permitted activity. OHV use areas open to cross-country use could

have some resources destroyed. This would be especially true in areas of high cultural sensitivity. Such destruction would be irreversible and irretrievable. Alternative A would have the greatest potential for a loss of cultural resource information.

Development of mineral resources (e.g., oil, gas, coal, sand, and gravel) is irreversible. If these nonrenewable resources were extracted for consumption or use, they would be irreversibly removed. BLM Handbook H-1624-1, Planning for Fluid Minerals, acknowledges leasing of oil and gas resources as an irreversible commitment. As noted above, this would be most likely under Alternative A.

Additional stipulations under the draft LUPA could reduce the potential for development, but the stipulations under Alternatives B, C, and D would provide an increasingly restrictive environment for such development and so a decreasing likelihood of this impact.

4.27 Relationship Between Local Short-term Uses and Long-term Productivity

Section 102(C) of NEPA requires discussion of the relationship between local, short-term uses of human environment and the maintenance and enhancement of long-term productivity of resources. As described in the introduction to this chapter, short term is defined as anticipated to occur within the first 5 years of implementation of the activity; long term is defined as following the first 5 years of implementation but within the life of the LUPA.

Short-term use of the air quality resource would not affect long-term productivity, except that air quality emissions in high enough concentrations could reduce vegetation and plant vigor. However, these types of impacts are not expected for any of the action alternatives since they would restrict development. Additionally, management actions would result in various short-term impacts, such as increased localized soil erosion, fugitive dust emission, and vegetation loss or damage and decreased visual resource quality. These impacts would be expected only under Alternative A, which it would allow the most surface-disturbing activities.

Other surface-disturbing activities, including transportation and utility corridor construction, and mineral resource development would result in the greatest potential for impacts on long-term productivity. Management prescriptions and RDFs are intended to minimize the effect of short-term commitments and to reverse change over the long term. These prescriptions and the associated reduction of impacts would be greatest under Alternative C, with Alternative B close behind for such resources as vegetation and wildlife habitat. However, some impacts on long-term productivity might occur, despite the prescriptions intended to reduce impacts on GRSG habitat.

ROWs and short-term use of an area to foster energy and minerals would result in long-term loss of soil productivity and vegetation diversity. Impacts would persist as long as surface disturbance and vegetation loss continue. In general, the loss of soil productivity would be directly at the point of disturbance; even so, long-term vegetation diversity and habitat value could be reduced due to fragmentation and the increased potential for invasive species to spread from the developments or disturbances. Alternative A would have the greatest potential for short-term loss of productivity and diversity due to the high level of potential development and the lack of stringent mitigation and reclamation standards contained in Alternatives B, C, D,

and E1. Alternative C would provide the greatest long-term productivity by excluding development in many areas through closures or application of severe restrictions on development.

ROWs and the short-term use of GRSG habitat, big game crucial winter range, fawning and calving areas, and migratory corridors for energy and minerals could impair the long-term productivity of GRSG populations and big game populations. This would happen by displacing animals from primary habitats and removing components of these habitats that might not be restored for more than 20 years. These short-term uses could also affect the long-term sustainability of some special status species. The potential for these impacts would vary by alternative because long-term deterioration of GRSG habitat because of mineral activity would be more evident under Alternative A. Alternative C would provide the most protections to reduce the long-term losses due to the 3 percent disturbance caps in all designated habitat.

The short-term resource uses associated with travel and transportation and mineral development (individual short OHV trips, oil and gas seismic exploration, natural gas test well drilling, and the noise associated with these activities) would have adverse impacts on the long-term productivity of GRSG populations. This would be the case if these resource uses were to infringe on GRSG winter habitat, brood-rearing habitat, and summer habitat. These activities, though short-term individually, could have collective long-term impacts on GRSG productivity and health if they were to increase in the long term.

Chapter 5
Cumulative Impacts

CHAPTER 5
CUMULATIVE IMPACTS

This section presents the cumulative impacts on the human and natural environment that could occur from implementing the alternatives presented in **Chapter 2**, Alternatives. This section is organized by topic, similar to **Chapters 3**, Affected Environment, and **4**, Environmental Consequences.

Cumulative impacts are effects on the environment that result from the impact of implementing any one of the Utah GRSG LUPA/EIS alternatives in combination with other actions outside the scope of this LUPA, either within the planning area or adjacent to it. Cumulative impact analysis is required by CEQ regulations because environmental conditions result from many different factors that act together. The total effect of any single action cannot be determined by considering it in isolation, but must be determined by considering the likely result of that action in conjunction with many others. Evaluation of potential impacts considers incremental impacts that could occur from the proposed project, as well as impacts from past, present, and reasonably foreseeable future actions. Management actions could be influenced by activities and conditions on adjacent public and private lands beyond the planning area boundary; therefore, assessment data and information could span multiple scales, land ownerships, and jurisdictions. These assessments involve determinations that often are complex and, to some degree, subjective.

5.1 CHANGES BETWEEN THE DRAFT LUPA/EIS AND PROPOSED LUPA/FINAL EIS

- The cumulative impacts analysis was separated out from **Chapter 4** and included as a separate chapter (**Chapter 5**) in the Proposed LUPA/Final EIS.
- WAFWA MZ cumulative effects analysis on GRSG: A quantitative cumulative effects analysis for GRSG was included in the Proposed LUPA/Final EIS (see **Section 5.4**, Special Status Species – Greater Sage-Grouse). This analysis was completed to analyze the effects of management actions on GRSG at a biologically significant scale which as determined to be at the WAFWA MZ level. Chapter 4 of the Draft LUPA/EIS included a qualitative analysis and identified that a quantitative analysis would be completed for the Proposed LUPA/Final EIS at the WAFWA MZ level.

- The cumulative effects that could occur from implementing the BLM and Forest Service Proposed Plans presented in **Chapter 2**, in conjunction with other past, present, and reasonably foreseeable future actions, were incorporated.

5.2 CUMULATIVE ANALYSIS METHODOLOGY

The cumulative impacts discussion that follows considers the alternatives in the context of the broader human environment – specifically, actions that occur outside the scope and geographic area covered by the planning area.

Because of the programmatic nature of the LUPA and cumulative assessment, the analysis tends to be broad and generalized to address potential effects that could occur from a reasonably foreseeable management scenario combined with other reasonably foreseeable activities or projects. Consequently, this assessment is primarily qualitative for most resources because of lack of detailed information that would result from project-level decisions and other activities or projects. Quantitative information is used whenever available and as appropriate to portray the magnitude of an impact. The analysis assesses the magnitude of cumulative impacts by comparing the environment in its baseline condition with the expected impacts of the alternatives and other actions in the same geographic area. The magnitude of an impact is determined through a comparison of anticipated conditions against the naturally occurring baseline as depicted in the affected environment (see **Chapter 3**) or the long-term sustainability of a resource or social system.

The following factors were considered in this cumulative impact assessment:

- Federal, nonfederal, and private actions
- Potential for synergistic effects or synergistic interaction among or between effects
- Potential for effects across political and administrative boundaries
- Other spatial and temporal characteristics of each affected resource
- Comparative scale of cumulative impacts across alternatives

Temporal and spatial boundaries used in the cumulative analysis are developed based on resources of concern and actions that might contribute to an impact. The baseline date for the cumulative impacts analysis is 2014. The temporal scope of this analysis is a 20-year planning horizon.

Spatial boundaries vary and are larger for resources that are mobile or migrate (e.g., migratory birds) compared with stationary resources. Occasionally, spatial boundaries could be contained within the planning area boundaries or an area within the planning area. Spatial boundaries were developed to facilitate the analysis and are included under the appropriate resource section heading. The cumulative effects analysis for all topics included an analysis of cumulative effects at the planning area level. For Special-Status Species – Greater Sage-Grouse, cumulative effects analysis included an analysis at the WAFWA MZs II, III, IV, and VII levels, in addition to the planning-level analysis. WAFWA MZs are biologically based delineations that were determined by GRSG populations and subpopulations identified within seven floristic provinces. Analysis at

this level enables the decision maker to understand the impacts on GRSG at a biologically meaningful scale.

5.3 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Past, present, and reasonably foreseeable future actions are considered in the analysis to identify whether and to what extent the environment has been degraded or enhanced, whether ongoing activities are causing impacts, and trends for activities in and impacts on the area. Projects and activities are evaluated based on proximity, connection to the same environmental systems, potential for subsequent impacts or activity, similar impacts, the likelihood a project will occur, and whether the project is reasonably foreseeable.

Projects and activities considered in the cumulative analysis were identified by the BLM, Forest Service, and other cooperating agencies. Each was asked to provide information on past, present, or reasonably foreseeable future actions. Additional information was obtained through discussions with agency officials and review of publicly available materials and Web sites.

Effects of past actions and activities are manifested in the current condition of the resources, as described in the affected environment (see **Chapter 3**). Reasonably foreseeable future actions are actions that have been committed to or known proposals that would take place within a 20-year planning period.

Reasonably foreseeable future action scenarios are projections made to predict future impacts; they are not actual planning decisions or resource commitments. Projections, which have been developed for analytical purposes only, are based on current conditions and trends and represent a best professional estimate. Unforeseen changes in factors such as economics, demand, and federal, state, and local laws and policies could result in different outcomes than those projected in this analysis.

Other potential future actions have been considered and eliminated from further analysis because there is a small likelihood these actions would be pursued and implemented within the life of the LUPA, or because so little is known about the potential action that formulating an analysis of impacts is premature. In addition, potential future actions protective of the environment (such as new regulations related to fugitive dust emissions) have less likelihood of creating major environmental consequences alone or in combination with this planning effort. Federal actions such as species listing would require the BLM and Forest Service to reconsider decisions created from this action because the consultations and relative impacts might no longer be appropriate. These potential future actions may have greater capacity to affect resource uses within the planning area; however, until more information is developed, no reasonable estimation of impacts could be developed.

Data on the precise locations and overall extent of resources within the planning area are considerable, although the information varies according to resource type and locale. Furthermore, understanding of the impacts on and the interplay among these resources is evolving. As knowledge improves, management measures (adaptive or otherwise) would be considered to reduce potential cumulative impacts in accordance with law, regulations, and the existing LUPs for the areas included in the analysis.

5.3.1 Other Regional Conservation Efforts

In addition to the Utah Sub-regional GRSG planning effort, other regional conservation efforts and policies are underway or in place in an effort to protect GRSG throughout its range. These are listed and summarized **Table 5.1**, Other Regional Conservation Efforts and Policies.

Table 5.1
Other Regional Conservation Efforts and Policies

Agency	Plan/Activity	Summary
	Federal Agencies	
DOI	Rangeland Fire Prevention, Management, and Restoration (Secretarial Order 3336)	Order sets in motion actions to enhance the protection, conservation, and restoration of a healthy sagebrush-steppe ecosystem in the Great Basin region, and to address the threat of rangeland fire at a landscape-level beginning 2015.
BLM/Forest Service	The Rocky Mountain Region consists of LUPs in North Dakota, South Dakota, Wyoming, and Colorado and in portions of Montana and Utah. The Great Basin Region consists of LUPs in California, Nevada, Oregon, and Idaho and in portions of Montana and Utah.	Throughout the west-wide GRSG range, the BLM and Forest Service are conducting LUPAs and revisions that specifically consider conservation measures for GRSG and GRSG habitat. These planning efforts are coordinated under two administrative planning regions across the entire range of the GRSG: Rocky Mountain Region and the Great Basin Region.
BLM	BLM Manual 6840 – Special Status Species Management	The manual presents policy and guidance for the management and conservation of BLM Special Status Species and habitat upon which those species depend. The policy objectives are to promote species recovery, reduce the need for listing under the ESA, and to institute proactive conservation strategies.
BLM	BLM National Greater Sage-Grouse Planning Strategy (2011)	Through RMPs, the BLM aims to develop new and revise regulatory mechanisms for GRSG and GRSG habitat conservation across BLM lands. The Planning Strategy charter establishes teams and operating procedures for the National GRSG Planning Strategy.
BLM	National Sage-Grouse Habitat Conservation Strategy: Guidance for Addressing Sagebrush Habitat Conservation in BLM Land Use Plans (2004)	The plan provides direction to BLM regarding sagebrush habitat and sagebrush-dependent wildlife consideration in the land use planning process.

Table 5.1
Other Regional Conservation Efforts and Policies

Agency	Plan/Activity	Summary
BLM	National Sage-Grouse Habitat Conservation Strategy: Guidance for the Management of Sagebrush Plant Communities for Sage-Grouse Conservation (2004)	The document provides guidance on managing, restoring, and enhancing sagebrush habitat on BLM-administered lands to support GRSG and other sagebrush-dependent wildlife.
BLM	BLM National Sage-Grouse Habitat Conservation Strategy (2011)	The IM provides direction to the BLM on appropriate use and consideration of the NTT report regarding findings related to GRSG.
BLM	Sage-Grouse Management Considerations for Energy Development (2010)	The IM addresses research findings on the impacts of energy development on GRSG and outlines necessary actions to protect GRSG populations.
BLM	Greater Sage-Grouse Interim Management Policies and Procedures (2011)	The document provides interim procedures and policies for GRSG and GRSG habitat conservation to be implemented with authorization and permitting activities on BLM land.
NRCS	Sage-Grouse Initiative	The initiative aims to benefit GRSG by reducing habitat fragmentation and improving rangeland health. The effort works toward increasing the sustainability of ranching and livestock grazing.
State Agencies		
State of Utah Governor's Office	Implementing the Utah Conservation Plan for Greater Sage-Grouse (Executive Order 2015/002)	Directs state agencies to minimize the impact of activities on GRSG, consult with the UDWR on decisions that could affect GRSG habitat, incorporate directives from the conservation plan into state operations and report on Utah efforts.
UDWR	Conservation Plan for Greater Sage-Grouse in Utah (2013)	The conservation plan identifies the 11 population areas in Utah that are the focus of GRSG conservation efforts, and helps coordinate the efforts of ten local working groups in the state.
Wyoming Sage-Grouse Working Group	Wyoming Greater Sage-Grouse Conservation Plan (2003)	The plan identifies steps that should be taken to minimize impacts on GRSG, with the goal of halting GRSG declines in Wyoming and increasing the abundance and distribution of GRSG in Wyoming.

Table 5.1
Other Regional Conservation Efforts and Policies

Agency	Plan/Activity	Summary
State of Wyoming Governor's Office	Greater Sage-Grouse Core Protection Area (State of Wyoming Executive Department Executive Order 2013-3)	Identifies GRSG core population areas and the management actions and allowable uses within GRSG core habitat and noncore habitat areas in the State of Wyoming.
Idaho Sage-grouse Advisory Committee	Conservation Plan for the Greater Sage-grouse in Idaho (2006)	The plan provides a management framework and scientific tools for GRSG conservation intended to guide local working groups in Idaho.
Nevada Governor's Greater Sage-grouse Advisory Committee	Strategic Plan for Conservation of Greater Sage-grouse in Nevada (2012)	The plan provides GRSG conservation recommendations intended to guide state level action and serve as a basis for development of an alternative in BLM resource management planning process in Nevada.
Tribes		
Ute Indian Tribe	Greater Sage-Grouse Conservation Ordinance	The ordinance provides rules that specify the requirements that oil and gas developers and operators must follow for the conservation and preservation of GRSG within the boundaries of the Uintah and Ouray Reservation.
Counties		
Box Elder	May 1, 2013 – Sage-Grouse Resolution	Adopted a resolution for GRSG management that is modeled on the Utah Conservation Plan for Greater Sage-Grouse.
Carbon	May 1, 2012 – Ordinance	Amend county master plan pertaining to the GRSG. Draft plan published May 2013.
Duchesne	May 6, 2013 – Resolution #13-09	Adopts the Utah Conservation Plan for Greater Sage-Grouse (Section 1) and initiates amendment process for county plan
Garfield	May 2, 2013 – Adopted Interim Sage-Grouse plan and initiated management plan amendment process	Draft plan published December 2013.
Grand	April 24, 2013 – Approved motion	Formally supports the Utah Conservation Plan for Greater Sage-Grouse.
Iron	Iron County Greater Sage-grouse Resource Management Plan - 2013	The plan is intended to maintain and enhance existing GRSG habitat and population in Iron County through incentive based programs and cooperative regulatory programs.

Table 5.1
Other Regional Conservation Efforts and Policies

Agency	Plan/Activity	Summary
Kane	Resolution 2013-12	Amend general plan to include the Kane County Greater Sage-Grouse Local Conservation Plan.
Rich	May 1, 2013 – Resolution 2013-1	Review and amend county general plan in light of State of Utah and BLM efforts to protect the GRSG.
Sanpete	Resolution 04 30 2013	Amend the General Plan by adding to it a Greater Sage-Grouse Management Plan in order to protect, maintain, improve and enhance GRSG habitat and populations in designated SGMAs of the County.
Sevier	April 22, 2013 – Resolution for management of Sage-grouse	Approve a plan modeled after the Utah Conservation Plan for Greater Sage-Grouse.
Tooele	April 22, 2013 – Resolution 2013-9	Approved provisions for management of GRSG.
Uintah	April 29, 2013 – Resolution 04-29-13 R1	Adopted the Utah Conservation Plan for Greater Sage-Grouse.
Wayne	May 6, 2013 – Resolution	Adopted existing Parker Mountain Adaptive Resource Management Plan and make it an amendment in its entirety to the County general plan. Also adopted all parts of the Utah Conservation Plan for Greater Sage-Grouse.
Sweetwater (Wyoming)	Adopted State of Wyoming Executive Order	
Local Working Groups		
Castle Country Adaptive Resource Management Local Working Group	Castle Country Greater Sage-Grouse Local Conservation Plan (2006)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
West Box Elder Adaptive Resource Management Local Working Group	West Box Elder Greater Sage-Grouse Local Conservation Plan (2006)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
Color Country Adaptive Resource Management Local Working Group	Color Country Greater Sage-Grouse Local Conservation Plan (2008)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.

Table 5.1
Other Regional Conservation Efforts and Policies

Agency	Plan/Activity	Summary
Morgan-Summit Adaptive Resource Management Local Working Group	Morgan-Summit Greater Sage-Grouse Local Conservation Plan (2006)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
Parker Mountain Adaptive Resource Management Local Working Group	Parker Mountain Greater Sage-Grouse Local Conservation Plan (2006)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
Rich County Coordinated Resource Management Sage-grouse Subcommittee	Rich County Coordinated Resource Management Greater Sage-Grouse Conservation Plan (2006)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
Southwest Desert Adaptive Resource Management Local Working Group	Southwest Desert Greater Sage-Grouse Local Conservation Plan (2007)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
Strawberry Valley Adaptive Resource Management Local Working Group	Strawberry Valley Greater Sage-Grouse Local Conservation Plan (2006)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
Uinta Basin Adaptive Resource Management Local Working Group	Uinta Basin Greater Sage-Grouse Local Conservation Plan (2007)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
West Desert Adaptive Resource Management Local Working Group	West Desert Greater Sage-Grouse Local Conservation Plan (2007)	This plan provides an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level using state and federal agency recommended strategies and locally analyzed threats.
The Southwest Wyoming Local Sage-grouse Working Group	Southwest Wyoming Sage-Grouse Conservation Assessment and Plan (2007)	The conservation strategy details resource management recommendations based on prioritization of risks. The goal of the plan is to maintain and enhance

Table 5.1
Other Regional Conservation Efforts and Policies

Agency	Plan/Activity	Summary
		GRSG population and habitat, and increase monitoring efforts.
Multi-Agency Efforts		
WAFWA	Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (2004)	The document is an assessment of the current situation and trends in GRSG populations and the dominant factors that individually and cumulatively influence sagebrush habitats, and provides a synthesis of the conservation status for GRSG and sagebrush ecosystems in western North America.
WAFWA	Greater Sage-Grouse Comprehensive Conservation Strategy (2006)	The plan sets forth sub-strategies designed to facilitate other established conservation plans, by use of monitoring, research, and outreach associated with GRSG conservation strategy.
Range-wide Interagency Sage-Grouse Conservation Team	Near-Term Greater Sage-Grouse Conservation Action Plan (2012)	The Range-wide Interagency Sage-Grouse Conservation Team evaluated risks to GRSG populations, conservation measures that address those risks, by area; expected outcomes and the resources needed to accomplish those conservation measures and prioritize those actions.
Western Governors' Association	Conserving the Greater Sage-Grouse – A Compilation of Efforts Underway on State, Tribal, Provincial, and Private Lands (2004)	The document presents a compilation of state and local conservation efforts throughout GRSG range across 11 western states and 2 Canadian provinces.

UDWR completed the *Conservation Plan for Greater Sage-Grouse in Utah* in 2013 (Utah Greater Sage-Grouse Working Group 2013). The conservation plan identifies the 11 population areas in Utah that are the focus of GRSG conservation efforts, and helps coordinate the efforts of ten local working groups in the state. The goal of the plan is to protect, maintain, improve, and enhance GRSG populations and habitats on public and private lands within the established population areas. It includes conservation strategies and measurable objectives regarding populations and habitat, but does not place specific restrictions on private land use. The plan is designed to eliminate the threats facing the GRSG while balancing the economic and social needs of the residents of Utah through a coordinated program that provides for:

- incentive-based programs for private, local government, and SITLA lands, and a
- reasonable and cooperative regulatory programs on other state and federally managed lands

The plan limits any new, permanent disturbance of the habitat within each population area. If disturbance occurs, mitigation would be required at a 4-to-1 ratio and would be coordinated through a statewide mitigation program. The plan's protocol for handling disturbance includes:

- Avoid disturbance if possible
- Minimize disturbance if it is unavoidable
- Mitigate disturbance through various projects

The above protocol would be offered to private landowners and to the Utah Trust Lands Administration or local governments through incentive-based programs.

Each year, the State of Utah is committed to the following:

- Protect 10,000 acres of private lands and state lands through conservation covenants, leases, easements, or other legal tools.
- Enhancing 25,000 acres of GRSG habitat.
- Increase the total amount of GRSG habitat acreage within and outside of SGMAs by an average of 50,000 acres.

The plan provides management provisions to address the following threats to GRSG:

- Fire control, suppression, and rehabilitation
- Invasive species
- Predation
- Vegetation management
- Extractive mineral development
- Transmission corridors
- Renewable energy development
- Recreation and OHV use
- Improper livestock grazing
- Hunting

Unlike the BLM or Forest Service, the UDWR has the regulatory authority to prescribe management that addresses predation and management of private and state lands.

5.3.2 Reasonably Foreseeable Future Actions

Future projects and activities identified as having the greatest likelihood to generate potential cumulative impacts when added to the Utah GRSG LUPA/EIS alternatives are displayed in **Table 5.2**, Reasonably Foreseeable Future Actions.

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Utah Sub-regional Planning Area				
TransWest Express	725 mile 600 kV transmission line	Begins in south-central Wyoming, crosses Utah diagonally from northeast to southwest, and ends south of Las Vegas	Bald Hills, Uintah, Carbon, Strawberry, Emery, and Sheeprocks	Project under NEPA review; decision anticipated in 2015
Energy Gateway South Transmission Line EIS	650-mile 500 kV transmission line	Begins in south central Wyoming, crosses Utah diagonally from northeast to southwest, and ends in Mona, Utah	Uintah, Carbon, Strawberry, Emery, and Sheeprocks	Project under NEPA review; decision anticipated in 2015
Zephyr Transmission Line	500 kV transmission line	Begins in south central Wyoming, crosses Utah diagonally from northeast to southwest, and ends south of Las Vegas	Bald Hills, Uintah, Carbon, Strawberry, Emery, and Sheeprocks	Application received
Noxious Weed Treatments	Treating noxious weeds		All population areas	Ongoing
Motorized Travel Plan Implementation	Implementation of motorized route designation plans across the planning region		All population areas	Implementation actions underway
Fence marking	The NRCS is planning to mark fences within 3.2 miles of leks throughout Utah on private lands		All population areas	
Uinta Wasatch Cache National Forest				
Badger Hollow/Chicken Creek GRSG Habitat	Treatment of approximately 450 acres of sagebrush in Wasatch County	East of Strawberry Reservoir; Wasatch County, Utah	Strawberry	This is the last of three treatments in the area
3D Seismic Data Collection	Intense seismic data collection across	Uinta County, Wyoming	Wyoming-Uinta	Proposed in 2012;

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
	approximately 29,000 acres of brood-rearing habitat			anticipate implementation in 2014
Hoop Lake and Poison Mountain winter range vegetation improvement project	Treatment of 641 acres of conifers (e.g., lodgepole pine and limber pine) to restore aspen, shrubs, forbs and grasses; closest GRSG lek is approximately 5 miles away; habitat is suitable, however	Summit County, Utah	Wyoming-Uinta	Anticipate implementation in 2013
Saddle Creek Road Re-Location	Moves 2 miles of road outside of the riparian area and close roads that will no longer be needed	Headwaters of Left Hand Fork Blacksmith Fork, Cache County, Utah	Rich	Anticipate implementation in Summer 2013
Saddle Creek Sagebrush - Phase II	Treat 1,100 aces of sagebrush over the next 2 years	Headwaters of Left Hand Fork Blacksmith Fork, Cache County, Utah	Rich	Implementation in 2013 and 2014
Big Creek Vegetation	Treat 1,104 aces of sagebrush over the next few years	Rich County, Utah	Rich	NEPA complete; implementation in coming years
Black Crook Treatment	Treatment of 1,820 acres of pinion-juniper to enhance sagebrush habitat	Tooele County, Utah	Sheeprocks	Contracted in 2012
Noxious Weed Treatments	Treating noxious weeds (approximately 500 acres)	Wasatch, Juab, Tooele, Rich Counties, Utah	Rich, Wyoming-Uinta, Sheeprocks, Strawberry	Ongoing
Vernon Sage Harrow	1,792 acres of treatment	Tooele County, Utah	Sheeprocks	Implementation in 2014 and 2015
Ashley National Forest				
South Unit Oil and Gas Development	Field development plan for leases held by Berry Petroleum; up to 356 new wells on up to 162 well pads may be drilled over the next 5 to 20	Duchesne County, Utah; approximately 11 miles south of the town of Duchesne	Carbon	ROD signed in February 2012; ROD includes mitigation for GRSG

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
	years; each well is subject to site-specific review and approval through the APD process			
Vantage Energy (future developments	In the short term, additional oil and gas development within existing leases in the Gilsonite Ridge area; in the long term, future development proposals on existing leases in the Sowers Canyon and Anthro Mountain areas	Sowers Canyon, Anthro Mountain, Gilsonite Ridge, Duchesne County, Utah	Carbon	Unknown
Anthro Mountain GRSG study	An ongoing study monitoring the Anthro Mountain GRSG population and the success of the translocation of 60 GRSG hens to augment the population; does not involve habitat treatment	Duchesne County, Utah	Carbon	Ongoing
Travel Management Parts A and B	Continue to implement Travel Management Plan and review/adjust management of existing roads as needed	Duchesne County, Utah	Uintah, Carbon	Travel Plan signed in 2009; transportation system review ongoing
Upper Anthro Lop and Scatter	Remove encroaching conifers from up to 11,800 acres of sagebrush and mountain brush communities on Anthro Mountain; project will maintain habitat for GRSG and sagebrush-obligate species	Duchesne County, Utah	Carbon	ROD signed in 2012; implementation over a 5- to 7-year period beginning in 2013

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Taylor Mountain Vegetation Management	Removal of pinyon and juniper trees encroaching into GRSG habitat; project area will cover 1,602 acres; located on the Vernal Ranger District; methods will be lop and scatter of unwanted trees using chainsaws	Uintah County, Utah	Uintah	Implementation scheduled for April/May 2013
Antelope Flat Vegetation Management	Removal of pinyon and juniper trees encroaching into GRSG habitat	Daggett County, Utah	Uintah	Anticipate starting NEPA in 2014 or 2015
Taylor Mountain/Brush Creek Mountain GRSG Radio Telemetry Study	Radio collaring GRSG in the project area to better understand population dynamics and habitat utilization	Uintah County, Utah	Uintah	Active/ongoing cooperating with UDWR
GRSG Fence Reflectors Project	Installation of vinyl reflector materials around known GRSG areas to reduce mortality from collisions with barb-wire	Duchesne, and Uintah Counties, Utah	Carbon	Active and ongoing
Mosby Mountain Allotment Pipeline	Place a 4-mile-long pipeline from the Mosby Canal south of Julius Park to the Grouse Creek Pasture of the Mosby Allotment; main pipeline would feed two existing troughs	Uintah County, Utah	Uintah	NEPA scheduled for 2014
Forest Noxious Weeds Supplement	Noxious weeds program supplement allowing the use on newer and more effective herbicides	Duchesne, Uintah, Daggett Counties, Utah, and Sweetwater County, Wyoming	Uintah, Carbon	Decision anticipated in January 2013; implementation to begin in 2013

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Dixie National Forest				
Johns Valley Vegetation	Vegetation management project that includes 9,000 acres of treatment, including sagebrush	Powell Ranger District; Johns Valley area	Panguitch	Environmental analysis ongoing; decision anticipated in 2013
Coyote Hollow Grazing Assessment	Environmental analysis of the Coyote Hollow C&H Allotment.	Escalante Ranger District, Antimony Creek Watershed	Parker Mountain	Analysis anticipated in 2015
Dixie National Forest Motorized Travel Implementation	Travel management actions forest wide; designated open travel system	All ranger districts on the Dixie National Forest	All populations across National Forest System lands	NEPA completed (2009); implementation actions ongoing
Johns Valley Defensible Fire Space	Fuels treatment project around and near the Widtsoe townsite	Escalante Ranger District, near Widtsoe	Panguitch	Environmental analysis anticipated in 2015
Flake Mountain Range Structures	Range structural improvement environmental analysis	Powell Ranger District in Johns Valley	Panguitch	Environmental analysis anticipated in 2014
Tropic to Hatch 138 kV line	New construction of a 138 kV power line from Tropic to Hatch, Utah	Escalante and Powell Ranger Districts; Johns Valley area	Panguitch	NEPA completed (2012); implementation actions ongoing
Paunsaugunt Vegetation Management	Project on the Paunsaugunt Plateau to perform the following vegetation treatments: commercially harvest 866 acres of mixed conifer forest, regenerate 413 acres of aspen, reforest 194 acres of wildfire impacted lands, and pre-commercially thin 285 acres of mixed conifer forest	Powell Ranger District		NEPA completed; decision signed 2012

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Fishlake National Forest				
Oil and Gas Leasing Analysis	Authorize leasing of National Forest System lands for oil and gas activities	National Forest-wide	Panguitch and Parker Mountain	NEPA completed; decision signed May 2013
Pioneer, Wild Goose, Horse Hollow Fuels Reduction	Prescribe burn of 2,332 acres hazardous fuels along west side of Pahvant Range (Scipio to Meadow); remove 50 to 80 percent of vegetation within 7 treatment units to reduce fuel heights and load	Fillmore Ranger District; west side Pahvant Range	Potentially suitable habitat	Planning phase; decision anticipated in 2014
Watts Mountain Fuels Reduction	5,000 acres fuels reduction using a Dixie harrow mechanical treatment and prescribed fire	Fillmore Ranger District	Potentially suitable habitat	Planning phase; decision anticipated in 2014
UM Access Management	Reduce the number of miles of motorized trails and/or roads; reroute motorized trail outside of riparian habitat	Fremont River Ranger District	Potentially suitable habitat	Project under NEPA review; decision anticipated in late 2013
Boulder Foothills Fuels Reduction	Mechanically treat 3,834 acres with bobcat and chainsaw, pile, and burn	Fremont River Ranger District	Parker Mountain	Project under NEPA review; decision anticipated in late 2013
Solomon Basin Fuels Reduction	Mechanically thin and/or prescribe burn pinyon-juniper within 3,200-acre analysis area	Fremont River Ranger District	Parker Mountain	Planning phase currently; decision anticipated in 2015
Porcupine Fuels Treatment	Prescribe burn insect and disease infected conifer stands, and regenerate aspen within 35,000-acre analysis area	Fremont River Ranger District	Parker Mountain	Planning phase currently; decision anticipated in 2014

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
South Beaver Fuels Reduction	Prescribe burn up to 3,000 to 5,000 acres annually	Beaver Ranger District	Potentially suitable habitat	Planning phase currently; decision anticipated in 2015
Monroe Mountain Range Improvement Project	Construct 1 mile of fence and add a water distribution system to allotments on Monroe Mountain to improve livestock distribution, increase rangeland rest, and decrease browsing impacts on aspen	Richfield Ranger District – Monroe Mountain	Potentially suitable habitat	Project under NEPA review; decision anticipated in Spring 2013
Monroe Mountain Aspen Ecosystems Restoration Project	Restore aspen utilizing a variety of treatments to promote aspen regeneration and retention; treatments include mechanical and prescribed burning to mitigate conifer encroachment in aspen stands.	Richfield Ranger District – Monroe Mountain	Potentially suitable habitat	Project under NEPA review; decision anticipated in Fall 2013
Manti National Forest				
Shalom Timber Sale	Timber and fuels management 9,000 acres; work to be accomplished through 2020; traditional timber harvest treatments, followed with prescribed burning treatments	Carbon and Emery Counties	Carbon and Emery	Project under NEPA review; decision anticipated in Spring 2013
Pines Burn	Fuels management understory burn for ponderosa pine management on 1,500 acres.	Emery County west of the town of Emery	Emery	NEPA complete; project completion expected in 2014
Greens Hollow	Lease by application of 6,700 acres for coal extraction.	Emery County, 6 miles west of the town of Emery	Emery	Supplemental EIS work ongoing;

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
				decision anticipated 2013
Middle Mountain Liberty Pioneer # 1	Exploration gas well. Proposed well pad and road 5 acres or less	Emery County, 15 miles northwest of Orangeville	Emery	NEPA ongoing; decision anticipated 2013
Reeder View Gravel Pit	Forest Service gravel pit; existing project boundary is approximately 15 acres	Emery County, 13 miles northwest of Orangeville	Emery	NEPA under review; decision anticipated 2014
Graben Prescribed burn	Prescribed aspen regeneration burn	Emery County, 17 miles northwest of Orangeville	Emery	NEPA and decision complete
Swasey Wildlife Improvement and Hazardous Fuels Reduction Project	Multi-phase project that will treat a total of 8,422 acres; most of the project has been treated; phase IV was just submitted for funding; project is a combination of pinyon-juniper mastification and prescribed fire	Emery County; near Joes Valley Reservoir	Emery	Most of the project area has already been treated; phase IV has just been submitted for funding and is approximately 400 acres
Millers Flat Project	The Millers Flat Project is a habitat-improvement and fuels-reduction project on 15,328 acres; it is located on Millers Flat Road between Highway 31 (Huntington Canyon) and Joes Valley Reservoir to the south; it is a combination of beetle killed conifer salvage, wetland protection, and dispersed recreation management	Emery and Sanpete Counties; along Millers Flat Road between Highways 31 and 29	Approximately 6,900 acres is within the Emery Population Area	Being implemented

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Flat Canyon Coal Lease by application	The Flat Canyon Coal Lease Tract is approximately 2, 692 acres of federal coal reserves	Sanpete County; located in east-central Utah 5.5 miles southwest of the town of Scofield	Approximately 23 acres out of the 2,692 acres are within the Emery Population Area	Forest Service completed the consent to BLM
Gooseberry Narrows Reservoir	Bureau of Reclamation project on Forest Service and private land; project is approximately 1,200 acres	Sanpete County	Carbon	EIS is complete
Kanab Field Office				
Upper Kanab Watershed Vegetation Creek	Vegetation management project that includes 51,600 acres of treatment in a 130,000 acres area over the next 15 years using a variety of treatment methods; average of 1,800 to 2,000 acres per year	Kane County; near the town of Alton, Utah	Panguitch	Project approved in April 2011
Alton Coal Tract Lease-by-Application	Add 3,576 acres of federal surface or mineral estate to existing 300-acre mine on private land.	Kane County; near the town of Alton, Utah	Panguitch	Project under NEPA review, estimated ROD in 2014
South Canyon Veg Enhancement	Vegetation management project that includes 20,000 acres of treatment in a 50,000 acres area over the next 10 years using a variety of treatment methods; average of 1,800 to 2,000 acres per year	Garfield County; near the town of Panguitch	Panguitch	Project approved; being implemented
Water Development Mud Spring	Water development for GRSG in the 5-mile hollow area; 2 acres or less of disturbance, pipeline, and drinker off existing line	Garfield County; near the town of Panguitch	Panguitch	NEPA checklist started; implementation anticipated in 2014-2015

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Alton Burnt Shale Test Pit	Twelve small test sites for burnt shale.	Kane County; near Alton, Utah	Panguitch	NEPA started 2012
Grand Staircase-Escalante National Monument Livestock Grazing Plan Amendment	Update livestock and rangeland management plan which includes allotments in the Kanab Field Office administered by the monument.	Kane County; east of Glendale (six allotments)	Panguitch	NEPA started November 2013
Richfield Field Office				
Parker Knoll Pump Storage Hydroelectric Federal Energy Regulatory Commission Project	Create electricity using a two-reservoir, gravity-fed system; approximately 200 acres of GRSG habitat would be lost; mitigation involves GRSG habitat-improvement work in areas adjacent to the lost habitat	Piute County; 5 miles Southeast of Greenwich, Utah	Parker Mountain	Still in planning and NEPA stages
Parker Front GRSG Habitat Improvement Projects	Over the next 10 years, a total of 30,000 acres of pinyon-juniper and sagebrush habitat will be improved for GRSG; a variety of mechanical treatments will be used to expand and improve existing habitat along the Parker Front	Piute County; Grass Valley - Parker Front from Burville on the north to Antimony on the South	Parker Mountain	Yearly projects of approximately 3,000 acres would occur depending on funding; NEPA has been completed
Antimony GRSG Habitat Improvement Projects	Over the next 10 years, a total of 10,000 acres of pinyon-juniper and sagebrush habitat will be improved for GRSG; a variety of mechanical treatments will be used to expand and	Garfield County; southwest of Antimony; Mount Dutton Foothills	Parker Mountain	Yearly projects of approximately 1,000 acres will occur depending on funding; NEPA has been completed

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
	improve existing habitat along the Parker Front			
Hodge Ranch and Angle Bench Vegetation Enhancement	Remove 1,500 acres of Phase I and II pinyon-juniper and up to 1,400 acres of sagebrush enhancement	Piute County; west of Otter Creek Reservoir	Parker Mountain	Environmental assessment in process
Cedar City Field Office				
Hamlin Valley Resource Protection and Habitat Improvement Project	Vegetation-management project that includes 192,253 acres of potential treatments, of which 36,033 acres are within high-priority focus areas over the next 15 years using a variety of management tools	Iron and Beaver Counties in Hamlin and Pine Valleys	Hamlin Valley	Project under NEPA review; decision anticipated in Spring 2013
Seeding Programmatic Environmental Assessment	Vegetation management project to enhance previous treatments that have occurred over the past 60 years using a variety of management tools	Existing treatments/ seedings throughout the Cedar City Field Office (Iron and Beaver Counties)	Hamlin Valley, Bald Hills, and Panguitch	Project under NEPA review; decision anticipated in 2014-2015
Red Hills Habitat Improvement Project	Vegetation management project to enhance habitat/ watersheds using a variety of management tools	Iron and Beaver Counties west of Interstate 15/Parowan Valley	Bald Hills	Project under preliminary NEPA review; Rangeland Health Assessments and monitoring being completed
Black Mountains Habitat Improvement Project	Vegetation management project to enhance habitat/watersheds using a variety of management tools	Iron and portions of Beaver counties south of Minersville, Utah	Bald Hills	Project under preliminary NEPA review; Rangeland Health Assessments and monitoring

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
				being completed
South Beaver Vegetation Enhancement Project	Vegetation management project to treat 16,883 acres out of 144,417 acres project area; treated approximately 10,400 acres to date	Beaver County near Beaver, Utah	Panguitch	Project authorized in 2005
Sigurd-Red Butte Transmission Line	345 kV transmission line from Sigurd substation near Richfield, Utah, to the Red Butte Substation near Central, Utah	Sevier, Millard, Beaver, Iron, and Washington Counties; however, only passes through GRSG habitat in Iron County	Bald Hills	Project approved in December 2012; completion of construction anticipated for 2015
Greenville Bench Prescribed Burn	Prescribed fire, chaining, and seeding to reduce pinyon pine-juniper; approximate 9,000-acre burn unit remains to be treated (burned, aerial seeded, and chained)	Iron and Beaver Counties between Minersville and Beaver, Utah	Bald Hills	Project approved in 2002
Programmatic Weed Environmental Assessment	Programmatic weed environmental assessment	Cedar City Field Office	Hamlin Valley, Bald Hills, and Panguitch	Decision anticipated 2013
Price Field Office				
Emery Telcom Ford Ridge Fiber Optic Line	Installation of 18.38 miles of fiber optic line (2.76 miles on BLM-administered lands); 13.06 miles of line would be buried along existing roads, and 5.32 miles would be attached to existing PacifiCorp power poles; the line would run from Helper, Utah, to the towers on Ford Ridge	Carbon and a small portion of Utah County, Utah	Carbon	NEPA signed in 2012; ROW grant ongoing

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
	and back out to US Highway 6; the project would affect approximately 3.25 acres of BLM-administered lands			
West Tavaputs Plateau Natural Gas Full Field Development Plan	Project approved 626 well and 120 pads along with the infrastructure of roads, pipelines, compressor facilities and other facilities needed to produce oil and gas from the project area	Carbon County; 30 miles east of Price, Utah	Carbon	Project approved in July 2010 and is being implemented; additional development anticipated over next 10 years
Williams Draw Coal Lease by Application	The proposed action includes 4,200 acres of federal surface and mineral estate; the proposal may have several vents, drilling exploration holes on the surface and underground, and load-out facilities	Emery County near East Carbon, Utah	Carbon	Project is under NEPA review; decision anticipated in 2014
Greens Hollow Coal Lease by Application	Proposal includes 6,700 acres; a vent is proposed off site; minimal surface disturbances with the exception for exploration drilling	Sanpete and Sevier Counties near Emery, Utah	Emery	EIS is being completed
North Horn Coal	The proposal includes approximately 9,600 19,000 (SITLA and federal acres); 100 million tons; exploration drilling	Emery County near Orangeville	Carbon	NEPA exploration conducted on Forest Service surface
Cottonwood-A Trail Mountain SITLA	Coal exploration drilling being conducted on 8,000 acres	Northeast of Joes Valley Reservoir; Emery County	Carbon	

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Cottonwood B	Coal exploration drilling on 8,800 acres: surface estate is SITLA	Northeast of Joes Valley Reservoir; Emery County	Carbon	NEPA complete for exploration
Flat Canyon Coal Lease by Application	Lease by Application 3,792 acres; and Exploration License, 595 acres	Near Skyline Mine/electric Lake	Carbon	NEPA complete for exploration
Long Canyon Coal Lease by Application	Lease by Application 7,700 acres; and Exploration License	Carbon County	Carbon	NEPA complete for lease
Ford Ridge Fuels Reduction and Vegetative Restoration	The project would remove dead and dying trees, and reduce live crown spacing by thinning the remaining live trees within approximately 6,840 acres	Ford Ridge	Carbon	NEPA Completed in 2013
Cottonwood Ridge Pinyon-Juniper Treatment	The project would remove encroaching pinyon and juniper trees within 2,070 acres of BLM and State Surface	Carbon County/ West Tavaputs Plateau	Carbon	Project is under NEPA review; decision and implementation anticipated in 2015
Vernal Field Office				
Gasco Energy Inc. Uinta Basin Natural Gas Development Project	Approximately 206,826 acres west of the Green River and north of the Duchesne/Uintah and Carbon County line	North of Nine Mile Canyon; Uintah and Duchesne Counties	Carbon	NEPA completed in 2012
Greater Natural Buttes Development Project	Project to conduct infill drilling to develop oil and natural gas resources within the 162,911-acre Greater Natural Buttes Project Area	Uintah County, Utah	Uintah	NEPA completed in 2012
Anadarko Uintah Midstream LLC and Kerr	Install and bury in one trench the following pipelines: (1) 16-inch natural gas pipeline,		Uintah	

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
McGee Oil and Gas Onshore LP Pipelines	(2) 6-inch liquids pipeline			
Asphalt Ridge Tar Sands Development	Lease approximately 6,000 acres of Tar Sands Lands described in the Asphalt Ridge Tract, which is directly adjacent to existing approximately 16,000 acres of State leases	Just south of Highway 40 and west of Vernal, Utah	Uintah	NEPA ongoing
Newfield's Monument Buttes Oil and Gas Development Project	Proposed oil and gas development on approximately 119,669 acres		Uintah	
North Alger Oil and Gas Development Project	Proposed oil and gas development on approximately 2,390 acres		Uintah	
XTO Energy's Riverbend Directional Infill Project	Proposed infill project on approximately 17,127 acres		Uintah	
Petro-Canada Resources (USA), Inc.	Rye Patch Oil and Gas Development, Vernal Field Office	Directly North of Nine Mile Canyon in Duchesne County	Carbon	NEPA completed in 2008; project implementation ongoing
Ashley Valley Compressor 25 kV Power Line	PacifiCorp *does business as* Rocky Mountain Power proposes to install a 2.06-mile 25 kV line		Uintah	
Gilsonite Leasing	16,810 acres that are currently under prospecting permit application; the permits would either be issued or a Known Gilsonite Leasing Area would be established, thus allowing	Near Bonanza, Utah (south of Bonanza)	Uintah	The prospecting permit applications have been in place since the late 1980s; Known Gilsonite

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
	competitive leasing			Leasing Area report ongoing; NEPA to begin on some tracts in 2014
Phosphate Fringe Acreage Lease	1,627 acres of fringe acreage lease on BLM-administered lands	North of Vernal, Utah	Uintah	NEPA has started and awaiting a Development Scenario to complete the NEPA
Phosphate Competitive Lease Application	1,186 acres on National Forest System lands	North of Vernal, Utah	Uintah	Information submitted to Forest Service to begin the process
Phosphate Prospecting Permit Applications	3,606 acres on National Forest System lands	North of Vernal, Utah	Uintah	Information submitted to the Forest Service to begin the process
Salt Lake Field Office				
Lofgreen Hazardous Fuel Reduction	Reduce fire threat and improve wildlife habitat by thinning pinyon-juniper on approximately 3,600 acres on the western slopes of the East Tintic Mountains; mechanical shredding would be the preferred method of tree thinning	Southeast corner of Tooele County; east of the town of Lofgreen, Utah	The area is identified as occupied GRSG habitat	NEPA is near completion; Phase 1 is planned for implementation in Fall 2013
Grouse Creek Hazardous Fuel Reduction	Reduce fire threat and improve wildlife habitat by thinning juniper on approximately 2,500 acres; mechanical shredding would be the preferred method of tree thinning	West of the town of Grouse Creek in Box Elder County, Utah	The area is identified as occupied GRSG habitat	Work in adjacent areas is currently underway; the next phase is scheduled to begin in Fall 2013

Table 5.2
Reasonably Foreseeable Future Actions

Name	Description	Location	GRSG Population Area	Status of Action
Onaqui East Bench/Little Mountain Hazardous Fuel Reduction	Reduce fire threat and improve wildlife habitat by thinning juniper on approximately 2,200 acres; mechanical shredding would be the preferred method of tree thinning	Eastern slopes of the Onaqui Mountains in Tooele County, Utah	The area is identified as occupied GRSG habitat	1,200 acres are scheduled to be treated in Fall 2013; remaining acres will not be treated until new NEPA is completed; estimated completion for the document is Spring 2014
Hardrock Prospecting Permit Applications	4,001 acres on acquired lands	Vernon, Utah	Sheeprocks	NEPA complete
Use of Military Operating Area	Department of Defense testing and training exercises	West Desert	Box Elder, Ibapah, Sheeprocks	Ongoing
Fillmore Field Office				
Furner Valley Habitat Improvement Project	800 acres	East Tintic Mountains	Sheeprocks	Scheduled Fall 2015
OHV Organized Races	Three sanctioned motorcycle races permitted annually	Sheeprock/Tintic Mountain OHV Area	Sheeprocks	Annual
August 2015 Oil and Gas Lease Sale	Proposed sale of 9 parcels, approximately 12,943 acres, and subsequent lease issuance to successful bidders	Juab County, west of Nephi	Sheeprocks	NEPA initiated December 2014

5.4 SPECIAL STATUS SPECIES – GREATER SAGE-GROUSE

This cumulative effects analysis discloses the short- and long-term effects on GRSG and its habitat from implementing each LUPA/EIS alternative, in conjunction with other past, present, and reasonably foreseeable future actions. In accordance with CEQ guidance, cumulative effects need to be analyzed in terms of the specific resource and ecosystem being affected (CEQ 1997). As discussed in **Chapter 1**, Introduction, the purpose for the proposed federal action is to identify and incorporate appropriate conservation measures to conserve, enhance, and restore GRSG habitat by reducing, eliminating, or minimizing threats to GRSG habitat. The WAFWA

delineated seven GRSG MZs based on populations within floristic provinces (Stiver et al. 2006). Therefore, the cumulative effects analysis study area for GRSG extends beyond the Utah Sub-region boundary and incorporates WAFWA MZs III, IV, and II/VII. The analysis of BLM and Forest Service actions in MZs III, IV, and II/VII is primarily based on MZ-wide datasets developed by the BLM National Operations Center. MZs II/VII are combined for the purpose of characterizing GRSG habitat conditions and impacts, as was done in *Summary of Science, Activities, Programs, and Policies That Influence the Range-Wide Conservation of Greater Sage-Grouse* (Manier et al. 2013). As indicated in the Draft LUPA/EIS, the cumulative effects analysis for the FEIS includes quantitative analysis where possible. Where quantitative data are not available, analysis is qualitative. This analysis includes past, present and reasonably foreseeable future actions for all land ownerships in the MZ, and evaluates the impacts of the Utah LUPA/EIS, by alternative, when added to those actions.

The analysis of nonfederal actions is qualitative and includes a review and analysis of the following:

- State plans
- Coordination with states and agencies during consistency reviews
- Additional data from non-BLM-administered and non-National Forest System lands

Figure 5.1, WAFWA Management Zones, shows the boundaries of the WAFWA MZs and the BLM and Forest Service sub-regions. **Table 5.3**, Acres of PHMA and GHMA in the Utah Sub-region and WAFWA MZs, presents acres of PHMA and GHMA in the Utah Sub-region compared to the total by MZ.

Table 5.3
Acres of PHMA and GHMA in the Utah Sub-region and WAFWA MZs

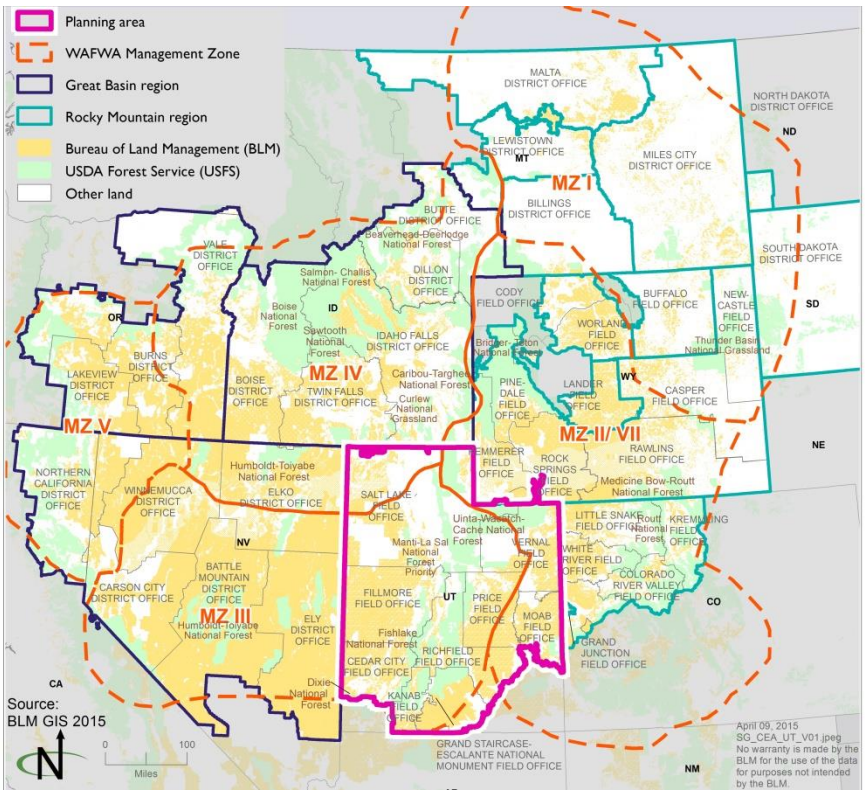
	PHMA in Sub-Region (Acres)	PHMA in MZ (Acres)	GHMA in Sub-Region (Acres)	GHMA in MZ (Acres)
MZ III	2,989,000	9,280,000	965,500	4,774,200
MZ IV	1,138,000	~22,000,000	0	~10,000,000
MZ II/VII	1,425,500	~14,000,000	831,400	~17,000,000

Source: BLM 2015

Utah has a relatively small influence in the context of the entire MZ II/VII and MZ IV because it contains a relatively small amount of PHMA or GHMA out of the total MZs. As a result, actions in this LUPA/EIS may have less of a cumulative impact on GRSG than those of other sub-regions in those MZs. In contrast, Utah has a larger influence on MZ III, comprising approximately 20 percent of GHMA and 30 percent of PHMA for that MZ. Cumulative effects in MZ III are discussed first in this cumulative effects analysis.

Section 5.4.1, Methods, lists methods and **Section 5.4.2**, Assumptions, lists assumptions used in the analysis. **Section 5.4.3**, Regional Efforts to Conserve GRSG, provides a broad-scale description of past, present, and reasonably foreseeable future federal, tribal, state, local, and

Figure 5.1
WAFWA Management Zones



private actions influencing GRSG in the sub-region. **Section 5.4.4**, WAFWA Management Zone III, describes existing conditions in MZ III and in the Utah Sub-region portion of this MZ, relevant cumulative actions, and analyzes threats to GRSG in MZ III and discusses the potential cumulative effects resulting from each threat for each alternative. **Section 5.4.5**, WAFWA Management Zone IV, describes existing conditions in MZ IV and in the Utah Sub-region portion of this MZ. **Section 5.4.6**, WAFWA Management Zones II/VII, describes existing conditions in MZ II/VII and in the Utah Sub-region part of this MZ. **Section 5.4.7**, Conclusion, discusses the cumulative effects on GRSG because of implementing each alternative, in combination with other private, local, regional, state, and federal past, present, and reasonably foreseeable future actions in each WAFWA MZ of the sub-region.

5.4.1 Methods

The cumulative effects analysis uses the following methods:

- Data from the USGS publication Summary of Science, Activities, Programs, and Policies That Influence the Range-Wide Conservation of Greater Sage-Grouse (Manier et al. 2013) establishes the reference condition against which the alternatives and other past, present, and reasonably foreseeable future actions are compared. Data from this publication are presented in terms of priority habitat and general habitat.

- The USFWS's 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered (USFWS 2010) and the USFWS publication Conservation Objectives: Final Report (i.e., the COT report; USFWS 2013a) were reviewed to identify the primary threats facing GRSG in each WAFWA MZ.
- Table 2 of the COT report lists threats to GRSG that are present and widespread in each population in the MZ. The list of threats that are directly or indirectly affected by BLM and Forest Service actions are those present and widespread in the MZ according to the COT report (USFWS 2013a).
- Sagebrush eradication is a component of many threats. Isolation/small population size is not analyzed separately, because no management actions directly address this threat. These two threats are discussed as a component of other threats and in the conclusions. Not all the threats discussed in this section represent major threats to GRSG in each planning area in the MZ, but each poses a present and widespread threat to at least one population.
- Predation was not included as a threat in the final COT report and was not identified by USFWS as a significant threat to GRSG populations (USFWS 2010). Predation is a natural occurrence that may be enhanced by human habitat modifications such as construction of infrastructure that may increase opportunities for nesting and perching or increase exposure of GRSG nests. In such altered habitats, predators may exert an undue influence on GRSG populations. Predation is discussed in this cumulative effects analysis in the context of these other threats.
- Each threat is analyzed, and a brief conclusion for each threat is provided.
  - The BLM National Operations Center compiled MZ-wide datasets for quantifiable actions in all proposed LUPA/EISs in MZs III, IV, and II/VII. These datasets provide a means by which to quantify cumulative impacts resulting from direct impacts of the threats identified in the COT report.
  - Data and information were gathered from other federal, state, and local agencies and tribal governments, where available, and were used to inform the analysis of cumulative impacts on GRSG from each of the threats in MZs III, IV, and II/VII.
  - The tables in this cumulative analysis display the number of acres across each entire MZ and the percentage of those acres that are located within the Utah sub-region. To calculate the total number of acres in each MZ, the number of acres in the other BLM and Forest Service Proposed Plans across the MZ are added to the number of acres in the applicable Utah LUPA alternative. For example, the total number of acres for Alternative A for MZ III includes all of the other Proposed Plans in MZ III plus Utah LUPA Alternative A. Likewise, the Alternative B acreage for MZ III includes all of the other Proposed Plans in MZ III plus Utah LUPA Alternative B.
- A discussion is provided for each alternative in **Section 5.4.7**. Each alternative considers the cumulative impacts on GRSG from each of the threats. It also

considers whether those threats can be ameliorated by implementing that particular alternative in conjunction with past, present, and reasonably foreseeable non-BLM and non-Forest Service actions in MZs III, IV, and II/VII.

- The list of relevant cumulative actions for each MZ was derived from each proposed BLM and Forest Service LUPs in MZs III, IV, and II/VII to provide an overview of the ongoing and proposed land uses there.
- Baseline data that are consistent across planning areas and that analyze cumulative effects for each alternative, including the Alternative A (no action) and the Proposed Plans, are used in this analysis.
- This analysis uses the most recent information available. For purposes of this analysis, the BLM and Forest Service have determined that the Proposed Plans for the other ongoing GRSG planning efforts in MZs III, IV, and II/VII are reasonably foreseeable future actions.
- PHMA and GHMA were developed to protect the best habitat and highest population density of GRSG. Although Alternative A does not designate PHMA or GHMA, spatial GIS data were clipped to these boundaries to allow for a consistent comparison across all alternatives.

5.4.2 Assumptions

This cumulative analysis uses the same assumptions and indicators as those established for the analysis of direct and indirect effects on GRSG in **Section 4.3.1**, Special Status Species – Greater Sage-Grouse. In addition, the following assumptions have been made:

- The timeframe for this analysis is 20 years.
- The cumulative effects analysis area extends beyond the sub-region and encompasses all of the WAFWA MZs. The quantitative impact analysis focuses on impacts across each MZ. The MZ is the appropriate geographic scope for this analysis because it encompasses areas with similar floristic conditions containing important GRSG habitat.
- The magnitude of each threat would vary geographically and may have more or less impact on GRSG in some parts of the MZ, depending on such factors as climate, land use patterns, and topography.
- A management action or alternative would contribute a net conservation gain to GRSG if there is an actual benefit or gain above baseline conditions. Baseline conditions are defined as the pre-existing condition of a defined area and/or resource that can be quantified by an appropriate metric(s). During environmental reviews, the baseline is considered the affected environment that exists at the time the NEPA analysis is initiated, and is used to compare predicted effects of a reasonably range of alternative actions.
- The cumulative effects analysis quantitatively analyzes impacts on GRSG and their habitat in the MZs. Impacts on habitat are likely to correspond to impacts on populations within the applicable MZ. This is because reductions or alterations in habitat and habitat effectiveness could affect reproductive success through

reductions in available forage or nest sites. Human activity could cause disturbance to the GRSG and its habitat, preventing them from breeding or successfully rearing offspring and ultimately recruiting new individuals into the population. Human activities could also increase opportunities for predation, disease, or other stressors (Connelly et al. 2004; USFWS 2010; Manier et al. 2013).

5.4.3 Regional Efforts to Conserve Greater Sage-Grouse

As part of the GRSG Rangewide Planning Effort, other BLM and Forest Service sub-regions, as explained in **Chapter 1**, are undergoing LUPA/EIS processes similar to this one for the Utah Sub-region. The Final EIS associated with each of these efforts has identified a Proposed Plans that meets the purpose and need of conserving, enhancing, and/or restoring GRSG habitat by reducing, eliminating, or minimizing threats. The management actions from the various Proposed Plans will cumulatively decrease the threat of GRSG habitat loss and will limit fragmentation throughout the range. Key actions present in many of the Proposed Plans include changes in land use allocations, a mitigation framework, an adaptive management strategy, anthropogenic disturbance cap, and lek buffers. Management within planning areas and sub-regions which also occur in WAFWA MZs III, VI, and II/VII will impact habitat that some Utah GRSG populations use (e.g., Hamlin Valley, Box Elder, Rich, and Uintah).

The BLM and Forest Service have incorporated management of SFA into its management approach for GRSG under the Proposed Plans. SFA are a subset of PHMA and represent recognized "strongholds" for the species that have been noted and referenced by the conservation community identified as having the highest densities of the species and other criteria important for the persistence of the species. Those portions of SFA on BLM-administered lands and National Forest System lands would be recommended for withdrawal from locatable mineral entry, subject to an NSO stipulation with no exceptions, modifications, or waivers (MZs III and IV only), and are prioritized for management and conservation actions, including, but not limited to, review of livestock grazing permits/leases. Management of SFA would enhance protection of GRSG and its habitat in these areas, providing a net conservation gain to the species in light of other past, present, and reasonably foreseeable future actions considered in this cumulative effects analysis. There are two areas of SFA comprising close to 4 million acres in MZ II (Bear River Watershed and Southwestern Wyoming); and three comprising approximately 7,800,000 acres in MZ IV (North-Central Idaho, Southeast Oregon/North-Central Nevada, and Southern Idaho/Northern Nevada). There are no SFA in MZ III.

In addition to the BLM and Forest Services' efforts to improve the regulatory framework for GRSG conservation throughout the species' range, other agencies, organizations, and private individuals are also making important contributions to conservation efforts. Because of the intermingled ownership of public and private lands in PHMA and GHMA, cooperation between landowners and wildlife managers, and coordination between state, federal, tribal, and local authorities will all be critical to the success of conservation efforts.

Statewide and Tribal Efforts

The three WAFWA MZs dividing Utah represent the state's diverse ecological and biological composition and present numerous threats to the state's GRSG populations (Manier et al.

2013). The UDWR is implementing the WAFWA Sage-Grouse Strategy across WAFWA MZs. The WAFWA Sage-Grouse Strategy includes monitoring, research, and funding of conservation projects for GRSG. A basic premise of the WAFWA Sage-Grouse Strategy is that additional conservation capacity must be developed at all levels (local, state and agency, and range-wide) in both the short term (first 3 to 5 years) and long term to ensure GRSG conservation.

The UDWR developed a *Conservation Plan for Greater Sage-Grouse in Utah* (2013). The conservation plan identifies 11 population areas in Utah that are the focus of GRSG conservation efforts, and helps coordinate the efforts of ten local working groups in the state. The goal of the *Conservation Plan for Greater Sage-Grouse in Utah* is to protect, maintain, improve, and enhance GRSG populations and habitats on public and private lands within established SGMAs (population areas). It includes conservation strategies and measurable objectives regarding populations and habitat, including a five percent permanent disturbance limit (as of April 2013), and through Utah Executive Order EO/2015/002 (see below), provides a regulatory mechanism to preserve GRSG through specific restrictions on public or private land use.

On February 25, 2015, Utah Governor Gary Herbert signed Utah Executive Order EO/2015/002. The Executive Order directs state agencies whose actions may affect GRSG to implement Utah's *Conservation Plan for Greater Sage-Grouse in Utah* (Utah Greater Sage-Grouse Working Group 2013) in GRSG population areas identified in the 2013 Conservation Plan.

Earlier efforts in Utah included formation of Utah's Sage-Grouse Plan Committee, comprised of members from public and private entities, which prioritized threats to the species across the state in Utah's Greater Sage-Grouse Management Plan (2009). The plan sought to protect and maintain occupied habitat, while restoring 175,000 acres of habitat by 2014. The plan provided an overall strategy for local working groups to use in implementing conservation actions, while providing annual updates detailing those actions taken for specific strategies identified in each plan. One recent accomplishment report for the Strawberry Valley Adaptive Resource Management Area reported that 10,223 acres had been purchased within the Management Area by the Utah Reclamation and Mitigation Commission (Strawberry Valley Adaptive Resource Management Local Working Group 2006).

The Ute Indian Tribe has a Greater Sage-Grouse Conservation Ordinance, which specifies the requirements that oil and gas developers and operators must follow for the conservation and preservation of GRSG within the boundaries of the Uintah and Ouray Reservation. The Goshute Tribe has jurisdiction over GRSG habitat within the Ibapah Population Area and implements the Utah State Plan cooperatively on tribal lands with local area working groups (Utah Greater Sage-Grouse Working Group 2013).

Counties and Local Working Groups

As shown in **Section 5.4.8**, MZ-Wide Reasonably Foreseeable Future Actions Summary Tables, several Utah counties have adopted resolutions for GRSG management modeled in part on the statewide 2013 *Conservation Plan for Greater Sage-grouse in Utah*, with provisions specific to their county and the use of incentives and cooperative conservation programs.

The ten local working groups in the Utah Sub-region (Castle Country, West Box Elder, Color Country, Morgan-Summit, Parker Mountain, Rich County, Southwest Desert, Strawberry Valley,

Uinta Basin, West Desert Adaptive Resource Management Local Working Groups) and one in Wyoming (Southwest Wyoming) operate under plans providing an adaptive framework for voluntary and collaborative GRSG and GRSG habitat conservation at the local level, using state and federal agency-recommended strategies to address threats to GRSG in their local areas (see **Section 5.4.8**).

Individual conservation plans have been prepared by most local working groups to develop and implement strategies to improve or maintain GRSG habitat and reduce or mitigate threats at the local level. The proposed conservation actions and recommendations in these plans are voluntary actions for private landowners. Local working group projects have included monitoring, research, and mapping habitat areas, as well as public outreach efforts such as landowner education and collaboration with federal, state, and other local entities. These efforts provide a net conservation gain to GRSG through increased monitoring and public awareness.

Local working groups are also active in other states and each has a conservation plan. There are six GRSG local working groups in Nevada (MZs III and IV): Washoe/Modoc, North Central Nevada, Northeastern Nevada Stewardship Group, White Pine, Lincoln, and South Central Nevada). Local working groups in southwest Montana and Idaho (MZ IV) include North Magic Valley, West Central, East Idaho Uplands, Big Desert, Shoshone Basin, Jarbidge, Curlew Valley, Owyhee County, Upper Snake, and Challis. Local working groups in MZ II/VII include Northwest Colorado, Piceance/Parachute Roan Creek, Northern Eagle/Southern Routt, North Park, Middle Park, Rich County, Morgan-Summit, Uintah Basin, Upper Green River Basin, Upper Snake River Basin, Wind River/Sweetwater River Basin, Southwest Wyoming, South-Central Wyoming, Bates Hole/Shirley Basin, and Bighorn Basin.

Other Statewide Efforts

Montana Statewide Efforts – MZ II/VII and MZ IV

The Montana Department of Fish, Wildlife and Parks is tasked with implementing the range-wide WAFWA Sage-Grouse Strategy (Stiver et al. 2006) in Montana. The WAFWA Sage-Grouse Strategy establishes monitoring and research, and provides outreach and funds conservation projects for GRSG. A basic premise of the WAFWA Sage-Grouse Strategy is that additional conservation capacity must be developed at all local, state, federal, and range-wide levels for both the short term (3 to 5 years) and for the long term (10 years or more) to ensure GRSG conservation.

In addition, the Montana Department of Fish, Wildlife and Parks' *Montana Management Plan and Conservation Strategy for Sage-Grouse* was initiated in 2005 to protect, maintain, and restore GRSG habitat. The plan ranks threats to the species across the state and provides an overall strategy for public and private cooperation in conservation actions. In 2013, the governor established the Greater Sage-Grouse Habitat Conservation Advisory Council to provide recommendations on policies and actions for GRSG conservation and provide regulatory authority for conservation actions. The council provided these recommendations in January 2014. The governor subsequently issued an executive order on September 9, 2014 (State of Montana 2014), based on the council recommendations that provided the direction for future GRSG conservation in Montana.

Montana Executive Order. The Montana governor issued an executive order on September 9, 2014 (State of Montana 2014), based on the council recommendations that provided the direction for GRSG conservation in Montana. Stipulations for development in the executive order and Montana Management Plan and Conservation Strategy for Sage-Grouse include but are not limited to:

- A 0.6-mile NSO buffer around the perimeter of active leks for new activities
- Locating new overhead power lines and communication towers a minimum of 0.6-mile from the perimeter of active leks
- A minimum 2.0-mile buffer from active lek perimeters for main roads and a minimum 0.6-mile buffer for facility site access roads
- A 5 percent limit on anthropogenic surface disturbance within the Density and Disturbance Calculation Tool examination area (based upon suitable habitat)
- As authorized by permitting agency or agencies, activities (production, maintenance and emergency activity exempted), will typically be prohibited from March 15 through July 15 outside of the NSO perimeter of an active lek and within 2 miles of that perimeter in Core Population Areas where breeding, nesting, and early brood-rearing habitat is present

The approach of the Montana executive order/Montana Management Plan and Conservation Strategy for GRSG is similar to the Wyoming executive order. Montana's plan will apply a disturbance cap in core habitat and will limit well density and apply TLs. The 0.6-mile buffer would protect males near leks during the breeding season; the density limits and disturbance cap would protect GRSG during nesting, brood-rearing, and winter concentration activities. The timing restrictions would reduce the potential for displacement or disruption during the breeding season.

Wyoming Statewide Efforts – MZ II/VII

Wyoming has established Core Population Areas to help delineate landscape planning units by distinguishing areas of high biological value. These areas are based on the locations of breeding areas and are intended to help balance GRSG habitat requirements with demand for energy development (Doherty et al. 2011).

In 2000, the Wyoming Sage-Grouse Working Group was formed to develop a statewide strategy for GRSG conservation. This group prepared the Wyoming GRSG Conservation Plan (Wyoming Sage-Grouse Working Group 2003) to provide coordinated management and direction across the state. In 2004, local GRSG working groups were formed to develop and implement local conservation plans. Eight local working groups around Wyoming have completed conservation plans, many of which prioritize addressing past, present, and reasonably foreseeable threats at state and local levels, and prescribe management actions for private landowners to improve GRSG conservation at the local scale, consistent with the overall Wyoming Core Strategy.

Wyoming Governor Matt Mead issued an executive order on June 2, 2011, that complemented and replaced several executive orders issued by his predecessor. The 2011 Wyoming executive

order articulates Wyoming's Core Population Area Strategy (Core Area Strategy) as an approach to balancing GRSG conservation and development. The order identifies GRSG Core Population Areas and the management actions and limits on allowable disturbance within GRSG core habitat and non-core habitat areas on public and private lands in Wyoming.

Wyoming's Industrial Siting Council (within the State's Department of Environmental Quality), which permits large development projects on all lands within the state, regardless of ownership, is subject to the terms of the Core Population Strategy. This could offer GRSG considerable regulatory protection in considering large wind energy and other development projects within Wyoming (USFWS 2010).

In Core Population Areas, there is a 0.6-mile NSO buffer around occupied leks and restrictions on fluid mineral activities in breeding and winter concentration habitat. This buffer provides protection for males during lekking season and acts in coordination with the density disturbance cap, which applies to all disturbance in GRSG habitat. This combination of protections could offer GRSG considerable regulatory protection when large wind energy or other development projects are being considered in Wyoming (USFWS 2010; Manier et al. 2013). Statewide modeling of trends under the Core Area Strategy suggests that with effective enforcement statewide, the strategy could reduce population losses by 9 to 15 percent across Wyoming. Moreover, the number of Core Areas predicted to maintain 67 percent of their current populations could increase from 20 to 25 under long-term scenarios (Copeland et al. 2013).

Estimates of GRSG populations indicate that Wyoming is home to the largest number of birds in the range of the species (USFWS 2010). The State's GRSG populations face many of the same major threats as Utah's, including intensive energy development in the Powder River and Greater Green River Basins, and extensive infrastructure, including transmission lines, fences, and roads (USFWS 2010). Eight local working groups around the state have completed conservation plans, many of which prioritize threats and prescribe management actions at the local working group scale.

Umbrella Candidate Conservation Agreement with Assurances for Wyoming Ranch Management. Candidate Conservation Agreements with Assurances are voluntary conservation agreements between the USFWS and one or more federal or private partners (e.g., the ranchers). In return for managing lands to benefit GRSG, landowners receive assurances against additional regulatory requirements should GRSG be listed under the ESA. Within Wyoming, the USFWS and Wyoming Governor's Office in conjunction with the BLM, NRCS, Forest Service, and other agencies, have developed an umbrella Candidate Conservation Agreement with Assurances for range management activities. Enrolled landowners are expected to comply with grazing specific conservation measures including but not limited to: avoid (or rotationally utilize) known nesting and brood-rearing habitat as a location for activities that concentrate livestock such as stock tank placement branding and roundup; place salt or mineral supplements in sites minimizing impacts on GRSG habitat; and within 24 months develop and implement a written grazing management plan to maintain or enhance the existing plant community as suitable GRSG habitat (USFWS et al. 2013).

Colorado Statewide Efforts – MZ II/VII

In 2008, the Colorado Division of Wildlife (now Colorado Parks and Wildlife) developed a state conservation plan, which prioritized threats and identified key issues facing conservation. The plan included issues, objectives, and strategies in detail. The strategies for conservation discussed responsible parties, lead agency, timeline, and cost associated with implementation of the strategy.

In 2012, a state conservation plan revision process began, and in consultation with stakeholders, a matrix summarizing implementation and effectiveness of the strategies was developed (Colorado Package), along with a subsequent Synthesis Report. The Colorado Package identified a number of conservation efforts within Colorado that have resulted in positive impacts on GRSG including acquisition of conservation easements and habitat improvement projects (Colorado Department of Natural Resources 2013). The Synthesis Report provided additional information on the effectiveness of conservation efforts such as county zoning ordinances that support protection of GRSG habitat, and measures from the Colorado State Board of Land Commissioners that will support adaptive management techniques to improve GRSG habitat (Colorado Department of Natural Resources 2014).

Colorado Oil and Gas Conservation Commission Rules. Oil and gas development in Colorado is governed primarily by statutory provisions of the Oil and Gas Conservation Act (Colo. Rev. Stat. § 34-60-100, et seq.) and rules developed by the Colorado Oil and Gas Conservation Commission (2 CCR 404-1, et seq.). The rules are intended to prevent waste and to conserve oil and gas in Colorado while protecting public health, safety, and welfare, including the environment and wildlife resources. As the state agency charged with promoting the exploration, development, and conservation of Colorado's oil and gas resources, the Colorado Oil and Gas Conservation Commission also handles the drilling permit process and ensures industry compliance with state-wide oil and gas statutes and regulations. Operators may be subject to consultation requirements under the Colorado Oil and Gas Conservation Commission Rules, to determine if COAs are necessary to minimize adverse impacts from propose oil and gas operations in sensitive wildlife habitat (e.g., PHMA).

Idaho Statewide Efforts – MZ II/VII and MZ IV

Similar to efforts in nearby states, the governor of Idaho is expected to issue an executive order providing direction for GRSG conservation in Idaho on state lands. This executive order is expected to be largely consistent with BLM and Forest Service direction, though exact details are not known and are speculative as of the time of publication of this Proposed LUPA/Final EIS.

Idaho Department of Lands prepared the *Proposed Greater Sage-Grouse Conservation Plan* (Idaho Department of Lands 2015). Released in February 2015, and complementing Idaho Governor Otter's proposed plan (Alternative E of the Idaho and Southwest Montana Draft LUPA/EIS), the draft plan focuses on three primary threats to GRSG in Idaho: wildfire, infrastructure, and invasive species. The plan outlines enforceable stipulations in leases, permits, and easements on Idaho State lands. Conservation measures in the plan will be used as BMPs for activities supporting fire prevention, suppression, and rehabilitation, regulating oil and gas development, some mining activities, and abandoned mine reclamation. While the plan is comprised of

voluntary management guidelines, the guidelines may be used by state regulatory agencies for projects requiring agency review or approval.

The Idaho Sage-grouse Advisory Committee prepared their Conservation Plan for the Greater Sage-grouse in Idaho (Idaho Sage-grouse Advisory Committee 2006) to provide guidance, tools, and resources to GRSG Local Working Groups, and to facilitate and provide statewide consistency between Local Working Group plans. The plan identifies 19 threats to GRSG and GRSG habitat and presents conservation measures to address each of those threats. Rural Fire Protection Districts have been established within the state to help suppress fires in GRSG habitat.

Nevada/California State Efforts – MZ IV and MZ III

The state of Nevada submitted a state alternative for inclusion in the Nevada and Northeastern California Sub-Region GRSG Draft LUPA/EIS. The *Nevada Greater Sage-Grouse Conservation Plan* (Sagebrush Ecosystem Technical Team 2014) includes regulatory mechanisms to avoid, minimize (with the use of design features), and mitigate impacts through SETT consultation and the Conservation Credit System (described in additional detail below) to protect and restore GRSG habitat. The plan defines an SGMA and delineates core, priority, and general GRSG habitat, and aims to reach a conservation objective of a net conservation gain to GRSG habitat due to new anthropogenic disturbances.

Mitigation will be required for all anthropogenic disturbances to GRSG habitat, including those that have minimized disturbances. Mitigation requirements will be determined by SETT consultation and the Conservation Credit System, a market-based mechanism that quantifies conservation outcomes (credits) and impacts from new anthropogenic disturbances (debits), defines standards for market transactions, and tracks conservation action implementation progress in the state.

The Nevada state plan only applies to lands within the state of Nevada; it does not apply to portions of the Nevada and Northeastern California Sub-region within California.

Oregon State Efforts – MZ IV

The Oregon Department of Fish and Wildlife has developed a strategy to promote conservation of GRSG and intact, functioning, GRSG habitats in Oregon. The *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (Oregon State Plan, Hagen 2011) describes the Oregon Department of Fish and Wildlife's proposed management of GRSG. It also provides guidance to public land management agencies and land managers for GRSG conservation. GRSG conservation guidelines in the State Plan are designed to maintain (at a minimum) or enhance the quality (the optimum) of current habitats. They will also assist resource managers in achieving the population and habitat objectives of the Oregon State Plan.

The Oregon State Plan provides biological recommendations for long-term conservation of GRSG in Oregon based on the best available science; however implementing recommendations is the responsibility of the respective land manager. Thus, the intent of the Oregon State Plan is plan is to inform decision-maker regarding the biological consequences of various actions on

GRSG, but not to dictate land management decisions. Similarly, GRSG conservation proposed in the plan is voluntary on private lands (Hagen 2011, p. viii).

The Oregon State Plan establishes "Core Areas" to help delineate landscape planning units by distinguishing areas of high biological value to GRSG. These areas are based on the locations of breeding areas, wintering areas, and connectivity corridors and are intended to help balance GRSG habitat requirements with development outside of Core Areas, which would be subject to stipulations and regulations (Hagen 2011, p. 80). The Oregon Department of Fish and Wildlife developed Core Areas necessary to conserve 90 percent of Oregon's GRSG population with emphasis on highest density and important use areas that provide for breeding, wintering, and connectivity corridors. BLM used the same boundaries of Oregon Department of Fish and Wildlife Core Areas to delineate PHMA.

While the plan is comprised of voluntary management guidelines, the guidelines may be utilized by state regulatory agencies including the Energy Facility Siting Council as COAs on a case-by-case basis for certain energy projects. For example, the council has jurisdiction on wind energy projects greater than 105 MW (Dave Budeau, phone conversation with author, March 26, 2015).

Further, The Oregon Governor's natural resources department is currently in the process of developing regulations for GRSG conservation. The forthcoming Sage-Grouse Conservation Action Plan will supplement the state plan and provide land use regulations and mitigations for Oregon core habitat areas (Dave Budeau, phone conversation with author, March 26, 2015).

Oregon Candidate Conservation Agreements (CCA) and Candidate Conservation Agreements with Assurances (CCAA). CCAs are voluntary agreements between the USFWS and one or more parties (including federal agencies) to address the conservation needs of on-listed species at risk of being listed under the ESA. CCAAs are similar, though these voluntary agreements are made between the USFWS and non-federal landowners. One CCA and several CCAAs are currently in place or will soon be implemented that will cover the entire GRSG range in the state of Oregon. Under these agreements and the associated Enhancement of Survival permit issued under the ESA, landowners would voluntarily undertake management activities on their properties to enhance, restore, or maintain habitat benefiting GRSG, in exchange for assurances that they would not be subject to increased land use restrictions should GRSG become listed under the ESA in the future. The agreements have a term of 30 years, and can be renewed upon expiration. As of April 2015, over 2.7 million acres of GRSG habitat in Oregon are either enrolled or pending enrollment under such agreements; the amount of GRSG habitat enrolled is expected to rise as the GRSG listing decision nears (Jeff Everett, Email to author, April 16, 2015).

<u>GRSG Programmatic Candidate Conservation Agreement for Rangeland Management Practices on BLM Lands in Oregon</u>. In cooperation with the BLM and USFWS, the Oregon Cattlemen's Association developed a Programmatic CCA to reduce or eliminate negative impacts of rangeland management practices to GRSG and to maintain and support livestock grazing practices that are beneficial or neutral to GRSG on enrolled allotments administered by the BLM in Oregon. The Programmatic CCA covers approximately 10.2 million acres of GRSG habitat on BLM grazing allotments in southeast Oregon; however, not all these lands may

eventually be enrolled in the programmatic CCA (USFWS 2013b). As of April 2015, BLM has received 65 written requests for enrollment covering 121 allotments on more than 1.9 million acres (Jeff Everett, Email to author, April 16, 2015).

Harney County Programmatic CCAA. After implementation of the Programmatic CCA described above, Oregon's Harney County Soil and Water Conservation District developed a programmatic CCAA for private lands in the county (USFWS 2013c). The covered area encompasses all GRSG habitat on non-federal lands in Harney County, Oregon and on some lands immediately adjacent to but outside of Harney County, including 346,965 acres of PPH and 825,395 acres of PGH. BLM-administered grazing allotments within Harney County are still eligible for inclusion under the Programmatic CCA. Because many grazers in Oregon utilize both private lands and BLM-administered allotments, the CCAA was structured after the Programmatic CCA in part to facilitate implementation of the agreements and encourage enrollment by such grazers (Jeff Everett, phone conversation with author, April 16, 2015). As of April 2015, 54 landowners have entered lands into the CCAA totaling approximately 320,000 acres of GRSG habitat (Jeff Everett, Email to author, April 16, 2015).

Oregon Multi-County Soil and Water Conservation District CCAA. Following development of the Harney County Programmatic CCAA, USFWS and the Soil and Water Conservation Districts from Baker, Crook, Deschutes, Grant, Lake, Malheur, and southern Union counties developed a CCAA for over 2.3 million acres of private rangelands within these counties, which represents the range of GRSG in Oregon. Again, BLM-administered grazing allotments within the counties are still eligible for inclusion under the Programmatic CCA, and again, the CCAA was structured after the Harney County CCAA in part to facilitate implementation of the agreements and encourage enrollment by grazers who utilize both private and BLM-administered allotments. As of April 2015, 55 landowners have entered lands into the CCAA totaling approximately 466,050 acres of GRSG habitat (Jeff Everett, Email to author, April 16, 2015).

The Oregon Department of State Lands CCAA. The Oregon Department of State Lands is working with the USFWS to develop a CCAA for State Common School Fund Rangelands in Oregon. These lands represent the final "gaps" in land ownership throughout GRSG range in Oregon not already covered by the CCA/CCAAs described above. The CCAA covers over 633,000 acres of Oregon State lands, including approximately 380,700 acres of low-density habitat, and 153,100 acres of core area habitat (80 *Federal Register* 9475). The required Environmental Assessment under NEPA is currently available for public comment and will be finalized in May 2015 (Jeff Everett, phone conversation with author, April 16, 2015).

Other Regional Efforts

Natural Resource Conservation Service Sage-Grouse Initiative

The NRCS Sage-Grouse Initiative is working with private landowners in 11 western states to improve habitat for GRSG (Manier et al. 2013). With approximately 31 percent of all sagebrush habitats across the range in private ownership (Stiver 2011, p. 39), including nearly 2 million acres (16 percent) in MZ V (Manier et al. 2013, p. 118), a unique opportunity exists for the

NRCS to benefit GRSG and to ensure the persistence of large and intact rangelands through long-term contracts and conservation easements (USFWS 2010, p. 5).

Participation in the Sage-Grouse Initiative program is voluntary, but willing participants enter into binding contracts or easements to ensure that conservation practices that enhance GRSG habitat, such as fence marking, protecting riparian areas, and maintaining vegetation in nesting areas, are implemented. Participating landowners are bound by a contract (usually 3 to 5 years) to implement, in consultation with NRCS staff, conservation practices if they wish to receive the financial incentives offered by the Sage-Grouse Initiative. These financial incentives generally take the form of payments to offset costs of implementing conservation practices and easements or rental payments for long-term conservation.

While potentially effective at conserving GRSG populations and habitat on private lands, incentive-based conservation programs that fund the Sage-Grouse Initiative generally require reauthorization from Congress under subsequent farm bills, meaning future funding is not guaranteed.

As of 2015, the Sage-Grouse Initiative has secured conservation easements on over 455,000 acres across the GRSG range (NRCS 2015), with the largest percentage of easements occurring in Wyoming (approximately 200,000 acres). Acres are not available for the Utah Sub-region. The Sage-Grouse Initiative has secured conservation easements on 11,191 acres in MZ III, 243,403 acres in MZ II/VII, and 98,167 acres within MZ IV (NRCS 2015). On these and additional private lands, the Sage-Grouse Initiative has completed other GRSG conservation actions, including implementation of sustainable grazing systems, conifer removal, vegetation seeding, and fence marking or removal. These conservation actions are targeted at the critical threats in each MZ, consistent with those outlined in the COT report. The Sage-Grouse Initiative clusters implementation to achieve landscape benefits.

Western Area Power Administration EIS

A programmatic EIS by the Western Area Power Administration and the USFWS for the entire upper Great Plains will focus future wind energy developments in specific corridors outside of GRSG core habitat (Western Area Power Administration 2013). In accordance with Section 7 of the ESA, preparation of the programmatic EIS has involved consultation between cooperating entities and the USFWS and preparation of a programmatic biological assessment to ensure that the action will not jeopardize the continued existence of any federally listed species, including the federal candidate GRSG. At the time of this RMPA specific conservation measures for protecting GRSG and its habitat under the programmatic EIS are not developed.

Utah Proposed LUPA/Final EIS

The Utah Proposed LUPA/Final EIS evaluates the following five alternatives and Proposed Plans:

- Alternative A, current management (the No Action Alternative).
- Alternative B, which uses GRSG conservation measures in the *Report on National Greater Sage-Grouse Conservation Measures* (NTT 2011) to form BLM and Forest Service management direction.

- Alternative C, which uses individual and conservation group-submitted management recommendations for GRSG and GRSG habitat to form BLM and Forest Service management direction.
- Alternative D, which is the Utah Sub-region's alternative (the agency-preferred alternative in the Draft LUPA/EIS). This alternative was developed by the Utah BLM in cooperation with the Forest Service Intermountain Region, and local USFWS. This alternative includes modifications to the conservation measures identified in the NTT report and is designed to address local ecological site variability. This alternative emphasizes balancing resources and resource use among competing human interests, land uses, and the conservation of GRSG habitat.
- Alternative E is divided into two alternatives, Alternative E1 and Alternative E2. Alternative E1 is based on the State of Utah's *Conservation Plan for Greater Sage-grouse in Utah* (Utah Greater Sage-Grouse Working Group 2013), and would apply to all BLM-administered and National Forest System lands located in Utah. Alternative E2 is based on the State of Wyoming's Governor's Executive Orders 2011-05 and 2013-3 with adjustments to ensure language was consistent with Forest Service planning regulations and policies. The management actions being considered under Alternative E2 would only apply to National Forest System lands in Wyoming
- The Proposed Plans are based on public comments received on the Draft LUPA/EIS, internal BLM and Forest Service review, new information, and best available science. The Proposed Plans incorporate adaptive management, monitoring, and mitigation for GRSG, as well as incorporation of RDFs (**Appendix G**, Required Design Features) to further reduce project impacts on GRSG habitat.

Sections 5.4.4 to **5.4.6** disclose cumulative impacts, organized by threats to GRSG, for each of the MZs comprising the Utah Sub-region.

5.4.4 WAFWA Management Zone III

MZ III consists of seven GRSG populations in Nevada and Utah (USFWS 2013a, p. 19-22) including Northeast Interior Utah, Sheeprocks, Emery, and South Central Utah in Utah, and Northwest Interior Nevada, Southern Great Basin, and Quinn Canyon Range in Nevada.

Existing Conditions in MZ III and the Utah Sub-region

This section summarizes existing conditions and past and present actions in the Utah Sub-region planning area (provided in more detail in **Chapter 3**, Affected Environment) and MZ III as a whole. Reasonably foreseeable future actions are discussed in **Section 5.4.8**.

GRSG Habitat and Populations

MZ III consists of GRSG populations in the Southern Great Basin in Nevada and Utah. The State of Utah defines population areas slightly differently than those in the COT report. As defined by the state, the population areas in Utah within this WAFWA MZ are Strawberry and Carbon (Northeast Interior Utah); Parker Mountain, Panguitch, and Bald Hills (South Central Utah); Ibapah and Hamlin Valley (Southern Great Basin); and Sheeprocks and Emery. MZ III is part of a stronghold for GRSG (that includes MZs III, IV, and V). MZs III, IV, and V contain the largest area of habitat range-wide having a low similarity to extirpated portions of the range (Wisdom

et al. 2011). Despite containing large expanses of sagebrush habitat, this MZ faces high risks from wildfire (USFWS 2013a, p. 70) due to the difficulty in restoring burned habitat (Pyke 2011) and the unpredictability of location, extent, and outcome of wildfire (USFWS 2013a).

BLM-administered, National Forest System, and other federal lands in MZ III account for over 11 million acres of GRSG habitat (nearly 80 percent of all GRSG habitat), with state and private lands accounting for approximately 2.6 million acres of GRSG habitat (nearly 20 percent) (Manier et al. 2013, p. 118) therefore conservation measures on private lands may be less influential. However, large areas of influence exist from some threats; therefore, collaboration and prioritization of habitats across jurisdictions is still important in this WAFWA MZ (Manier et al. 2013). Along with the approximately 11 million acres of surface estate, the BLM also has management authority over split-estate lands, with either state or privately held surface and federal subsurface mineral rights.

Predicted population trends in MZ III indicate that populations are stable; however, these scenarios are limited in their ability to predict the future, especially stochastic events and novel environmental conditions, especially given the small population sizes (Manier et al. 2013).

Table 5.4, Management Jurisdiction in MZ III by Acres of Priority and General Habitats, provides a breakdown of landownership and acres of GRSG habitat in MZ III. As the table shows, approximately 63 percent of the approximately 10 million acres of PHMA in MZ III is on BLM-administered lands. Approximately 81 percent of the nearly 4 million acres of GHMA in MZ III is on BLM-administered lands. Approximately 12 percent of PHMA is on National Forest System lands, and approximately 9 percent of GHMA is on National Forest System lands. In the Utah Sub-region, there are approximately 3,954,500 acres of GRSG habitat, including approximately 1,365,700 acres on BLM-administered lands and 642,200 acres on National Forest System lands. The remaining acres of GRSG habitat comprise private, local state, and other federal and tribal lands.

Table 5.4
Management Jurisdiction in MZ III by Acres of Priority and General Habitats

	Total Surface Area (Acres)	Priority (Acres)	General (Acres)	Non-habitat (Acres)
MZ III	78,429,300 (100%)	10,028,500 (13%)	3,970,100 (5%)	64,430,700 (82%)
BLM	45,097,500 (58%)	6,309,400 (63%)	3,199,800 (81%)	35,588,300 (55%)
Forest Service	12,377,600 (16%)	1,236,200 (12%)	356,200 (9%)	10,785,200 (17%)
Tribal and Other Federal	5,282,700 (7%)	260,800 (3%)	29,100 (<1%)	4,992,800 (8%)
Private	12,251,400 (16%)	1,836,200 (18%)	384,800 (10%)	10,030,400 (16%)
State	3,101,900 (4%)	385,900 (4%)	200 (<1%)	2,715,800 (4%)

Source: Manier et al. 2013, p. 118

Sagebrush cover is naturally limited and patchy across much of this region, due to geologic substrates and topographic formations creating microclimates and local environmental

conditions that enable sagebrush dominance; these conditions result in a lack of connectivity among subpopulations in this region (Knick and Hanser 2011).

This region is dominated by the large Southern Great Basin population, which occupies much of central and eastern Nevada; however, several smaller but significant populations are included in this WAFWA MZ, and priority management issues and challenges associated with these small subpopulations may be distinctive from other populations in the region (USFWS 2013a). A summary of the population areas in Utah is as follows (additional details for each population area are found in **Section 3.3**, Special Status Species – Greater Sage-Grouse).

- Strawberry is a small population with 10 year lek counts ranging between 55 to 158 males (estimated to range between 220 and 630 birds) that has decreased 95 percent from historic levels (Bunnell 2000) but is now regarded as stable, though threatened by high native and nonnative predation levels and growing recreational and energy-related development. Major restoration efforts, including predator control and removal of grazing, have been conducted in this habitat
- Carbon is located in the northern portion of the Colorado Plateau in central Utah. The 10 year male lek counts ranging between 126 and 267 (estimated to range between 284 and 1068 birds) (UDWR 2013) and is stable to slightly increasing. The populations are threatened by conifer encroachment and habitat fragmentation from energy development and associated infrastructure (USFWS 2013a).
- Emery population is small with 10 year male lek counts range from 9 and 62 males (estimated population ranges from 36 and 248 birds) (UDWR 2013) and 9 years of consistent lek counts suggest it is increasing. The population is isolated on high-elevation sagebrush steppe on the Wasatch Plateau and is threatened by isolation/small population size, and by sub-surface mining activity (USFWS 2013a).
- Sheeprocks is an isolated population with 10 year male lek counts that range from 50 to 190 males (estimated population ranges from 200 to 760 birds) (UDWR 2013). This population is stable, though threatened by wildfire, invasive species, conifer encroachment wild horses, avian predation, and recreation (USFWS 2013a).
- Parker Mountain is located in south-central Utah and is a large and well-studied population with 10 year lek counts ranging from 586 to 1,389 males (estimated population ranges from 2,344 to 5,556 birds) (UDWR 2013). It is a stable population that is minimally fragmented and has low levels of disturbance; it is at low risk but is threatened by conifer encroachment and potential isolation from loss of connectivity to smaller surrounding populations (USFWS 2013a).
- Panguitch has 10 year male lek counts that ranges from 162 to 490 males (estimated population ranges from 648 to 1,960 birds) (UDWR 2013). It is located on a series of linked benches and valleys between mountains and canyons. GRSG move between valleys and benches to meet seasonal habitat needs. The population is considered stable, though threatened by increased abundance of raven predators, localized human development, and conifer encroachment (USFWS 2013a). Habitat restoration to remove pinyon-juniper is occurring.

- The Bald Hills Population Area has 10 year male lek counts that range from 36 to 144 males (estimated population that ranges from 144 to 576 birds) (UDWR 2013) and is located in southwestern Utah in Beaver and Iron Counties. Currently, the population is constrained to the Bald Hills Management Area by vegetation fragmentation and human development, but habitat improvements could connect this population to east to the Panguitch Management Area, north into Beaver County, and west to Hamlin Valley. The south-central Utah population as a whole is regarded as stable with high potential for growth (USFWS 2013a). Key threats are fire, conifer encroachment, human infrastructure, and potential geothermal energy development.
- Ibapah in the Southern Great Basin is partly in central-western Utah but primarily in Nevada. Ten-year male lek counts in for Utah leks range from 0 to 84 males (estimated population ranging from 0 to 336 birds) (UDWR 2013) and appears to be declining. Fire, invasive species, high levels of avian predation, and conifer encroachment pose threats to this population.
- Hamlin Valley is located in southwestern Utah in Beaver and Iron Counties on the border of Utah and Nevada. This population consists of a small number of GRSG with 10-year male lek counts ranging from 48 to 129 males (estimated population ranging from 192 to 516 birds) that use less than 10 leks and has important connectivity with other areas of the range. This population spends a portion of its time in Nevada, usually during the summer months. Restoration could link this population to south-central Utah (Bald Hills). This population is regarded as stable with a high potential for growth. Threats include conifer encroachment, wildfire, wild horses, and high avian predation (USFWS 2013a).

Population Trends in Management Zone III

Populations within MZ III are described under *GRSG Habitat and Populations*, above. Trends for these populations are summarized below.

MZ III contains the most GRSG populations (along with MZ IV) of MZs range-wide; however, these populations are also some of the most isolated and exhibit lower densities of strutting male GRSG at leks (Manier et al. 2013, p. 11). Predicted population trends indicate that populations in MZ III are unlikely to fall below 200 males within the next 30 years but has a 25 percent chance of falling below 500 males within 100 years (Garton et al. 2015).

The Nevada portion of the Southern Great Basin population contains the largest number of GRSG within MZ III (USFWS 2013a, p. 70). Garton et al. (2015) determined that this population has declined by 33 percent from 2007 to 2013. In addition, Garton et al. (2015) determined that this population is unlikely to decline below 20 males within the next 30 years and has a 10 percent chance of declining below 50 males within 100 years. However, these scenarios may be drastically influenced by unforeseen stochastic events or novel environmental conditions.

For the Northeast Interior Utah population (Strawberry and Carbon), Garton et al. (2015, p. 330) reported that the population declined by 42 percent over the assessment period. Similarly, the South Central Utah population (Parker, Panguitch, and Bald Hills) declined 51 percent over the assessment period (Garton et al. 2015, p. 34). However, the Emery population has remained

relatively stable over the assessment period (Garton et al. 2015, p. 34). The Sheeprocks population declined 78 percent between 2007 and 2013 (Garton et al. 2015, p. 34).

Relevant Cumulative Actions

This cumulative effects analysis considers the incremental impact of the Utah Proposed LUPA and alternatives in combination with other past, present, and reasonably foreseeable future federal and non-federal actions on all lands in MZ III. Where these actions occur within GRSG habitat, they would cumulatively add to the impacts of BLM- and Forest Service-authorized activities set forth in the Utah Proposed LUPA. In addition to the conservation efforts described above, relevant reasonably foreseeable future cumulative actions occurring on federal, private, or mixed landownership in MZ III are described in the Proposed LUPAs for the Utah and Nevada and northeastern California LUPAs, hereby incorporated by reference. Relevant cumulative actions occurring in MZ III are described in **Section 5.4.8**.

A number of ROWs for utilities, pipelines, and fiber-optic lines are approved or in development in the sub-region, affecting Carbon, Emery, Bald Hills, and Sheeprocks Population Areas, as well as Uintah in MZ II. Uintah and Carbon areas have substantial numbers of coal and natural gas mining projects planned on both BLM-administered and National Forest System lands that would impact GRSG habitat. Coal mining and oil and gas development would also impact the Emery, Panguitch, and Rich Population Areas. In addition to these projects, noxious weed control, vegetation restoration, conifer removal, and fuels-treatment projects are ongoing and would have a beneficial impact on GRSG habitat.

The following is a partial list of large-scale past, present, and reasonably foreseeable future actions in MZ III that, when added to the Proposed Plans and alternatives for the Utah sub-region, could cumulatively affect threats to GRSG (see **Section 5.4.8** for more detail):

- TransWest Express, Energy Gateway South, and Zephyr transmission line projects, throughout Utah and a portion of Nevada
- Southern Nevada Water Authority ROWs, Nevada
- South Unit Oil and Gas Development, Duchesne County, Utah
- Greens Hollow Coal Extraction, Emery County, Utah
- Alton Coal Tract Lease-by-Application, Kane County, Utah
- West Tavaputs Plateau Natural Gas Full Field Development Plan, Carbon County, Utah
- Gasco Energy Inc. Uinta Basin Natural Gas Development Project, Uintah and Duchesne Counties, Utah
- Long Canyon Mine, Elko County, Nevada
- Luning and Enel Salt Wells Solar Energy Projects, Mineral and Churchill Counties, Nevada
- Salt Wells Geothermal Utilization Project, Churchill County, Nevada
- Gooseberry Narrows Reservoir, Sanpete County, Utah

- Conifer removal, fuels reductions, and weed treatment vegetation projects throughout Utah and Nevada
- Grand Staircase-Escalante National Monument Livestock Grazing Plan Amendment, Kane and Garfield counties, Utah
- Energy and minerals development on adjacent state, private, and tribal lands, Utah (see **Appendix R**, Oil and Gas Reasonably Foreseeable Development Scenario for Greater Sage-Grouse Occupied Habitat in Utah Sub-region)
- Military operating area overflights in the Utah Test and Training Range

The Utah Test and Training Range is a military test and training range in the west desert region of Utah that has the footprint of 2,675 square miles (6,930 square kilometers) of ground space and over 19,000 square miles (49,000 square kilometers) of air space. It is divided north and south by I-80 and is administered and maintained by the US Air Force's HQ Utah Test and Training Range, which was formerly known as the 388th Range Squadron out of Hill Air Force Base near Ogden, Utah. The site is frequently used by the US Air Force, US Marine Corps, and US Army for the disposal of explosive ordnance, testing of experimental military equipment, as well as ground and air military training exercises. Types of training that occur in the Utah Test and Training Range include air-to-air-combat, air-to-ground inert and live practice bombing, and gunnery training by Department of Defense aircrews. The Utah Test and Training Range has been used by the military for testing and training for the military since Congress appropriated the funds in 1940. The Utah Test and Training Range is the only military operating area within the Utah Sub-region, though the Nevada Test and Training Range is another military operating area within MZ III. The Utah Test and Training Range also extends into the southern portion of MZ IV.

There is some research suggesting that the presence of noise substantially above ambient levels can decrease lek attendance (Blickley et al. 2012). Based on this, it could be extrapolated that there may be some impact on GRSG from the noise from military operations. However, this research refers to chronic noise impacts. Since the activities that are authorized by the Utah Test and Training Range are short bursts of activity and only noise for a few minutes or in some cases a few seconds (a jet flying over or a disposal of an ordinance) and the fact that the testing and training have been ongoing for such an extended time and the populations in the area have persisted, it is reasonable to assume that they very sparse and temporary therefore are negligible. The proposed addition of the actions associated with the Proposed Plans, which would include measures to minimize noise from BLM- and Forest Service-permitted actions, would not increase the effects of noise above those already present.

Threats to GRSG in MZ III

In its COT report the USFWS identifies fire, spread of weeds, conifer expansion, infrastructure, grazing, habitat conversion to agriculture, energy development, recreation, and urbanization as the present and widespread threats facing GRSG in MZ III (USFWS 2013a). These threats impact GRSG mainly by fragmenting and degrading their habitat. The loss of sagebrush steppe across the West approaches or exceeds 50 percent in some areas and is a primary factor in long-term declines in GRSG abundance across its historical range (USFWS 2010).

Habitat fragmentation reduces connectivity of populations and increases the likelihood of extirpation of a local population from random events such as drought or outbreak of West Nile virus. Furthermore, climate change is likely to affect habitat availability to some degree by decreasing summer flows and limiting growth of grasses and forbs, thereby limiting water and food supply (BLM 2012b). Sensitive species such as GRSG, which are already stressed by declining habitat, increased development, and other factors, could experience additional pressures because of climate change.

Each threat discussed below was considered present (either localized or widespread) in at least one population in MZ III in the COT report. For more detail on the nature and type of effects and the direct and indirect impacts on GRSG in the sub-region, see the Special Status Species – Greater Sage-Grouse section of **Chapter 4**, Environmental Consequences. The quantitative impact analysis focuses on impacts in MZ III as a whole.

Wildfire

Nature and Type of Effects. Sagebrush burned by wildfire often requires many years to recover, especially after large fires. Contiguous old-growth sagebrush sites are at high fire risk, as are large blocks of contiguous dead sagebrush and sagebrush sites with a substantial cheatgrass understory. Before recovering, these sites are of limited use to GRSG, except along the edges and in unburned islands.

Because of its widespread impact on habitat, wildfire has been identified as a primary factor associated with GRSG population declines. Depending on the species of sagebrush and the size of a burn, a return to a full pre-burn community cover can take from 25 to 120 years (Baker 2011). In addition, fires can reduce invertebrate food sources and may facilitate the spread of invasive weeds.

While most sagebrush subspecies are killed by fire and slow to reestablish, cheatgrass recovers within 1 to 2 years of a fire from seed in the soil. This annual recovery leads to a reoccurring fire cycle that prevents sagebrush reestablishment (USFWS 2010, p. 22).

Management to prevent or control wildfires can also affect GRSG and habitat. Increased human activity and noise associated with fire suppression, fuels treatments, and prescribed fire in areas occupied by GRSG could affect nesting, breeding, and foraging behavior. Important habitats could be altered because of the use of heavy equipment, hand tools, and noise.

In addition, suppression may initially result in higher rates of conifer encroachment in some areas. In the initial stages of encroachment, fuel loadings remain consistent with the sagebrush understory. As conifer encroachment advances, fire return intervals are altered by decreasing understory abundance. The depleted understory causes the stands to become resistant to low-intensity wildfires; over years, the accumulating conifer loads contribute to larger-scale wildfires and confound control efforts due to extreme fire behavior.

Conditions in the sub-region and MZ III. Wildfire has been a primary threat to GRSG habitats and populations occurring across MZ III; the number and size of areas affected annually by fire in MZ III are an order of magnitude greater than is typical in the Wyoming Basin (MZ II) to the east. Challenges related to fire and fuels management have become pronounced or extreme in

MZ III where cheatgrass has invaded, increased fire intensity, and reduced fire return intervals (Manier et al. 2013, p. 81). In MZ III, 62 percent of habitat areas have high risk for fire, including within most GRSG populations in MZ III (Manier et al. 2013, p. 85-87). Since 2000, approximately 404,000 acres (3 percent) of GRSG habitat has burned in this MZ, with an average of 13,500 acres of GRSG habitat burned annually and a maximum observed fire area of 55,000 acres (Manier et al. 2013, p. 132). Over the last decade, 110,900 acres (0.8 percent) of GRSG habitats (priority and general combined) have burned in this MZ.

Fires on BLM-administered lands contribute 60 percent of average acres burned in this MZ annually (Manier et al. 2013, p. 82). An additional factor in the analysis of cumulative effects of fire on GRSG is the trend of increasing fire size and frequency and severity, due to factors including exotic annual grasses, and climate change. Several sub-populations of the Northwest Interior Nevada population have been extirpated from their range due to severe wildfire and inability of the habitat to recover (USFWS 2013a, p. 73).

Impact Analysis. Management actions in the Utah Sub-region that emphasize wildfire suppression in GRSG habitat would benefit the species by limiting habitat loss in the event of wildfire. Under current management (Alternative A), prescribed fire may be used to achieve habitat objectives; most existing LUPs support objectives of re-introducing fire into fire-dependent ecosystems and prioritizing response to wildfires and determining where fire can be used for resource benefit. Alternatives B, C, and E would set limits on the use of prescribed fire, while Alternative D and the Proposed Plans would allow its use if other treatment methods were not effective. The action alternatives all prioritize sagebrush protection in fuels treatment programs and would provide superior protection for sagebrush in prescribed burning, fuels treatment and fire suppression. The Proposed Plans would further reduce impacts from wildland fire by conducting the wildland fire and invasive species assessments and subsequent prioritization of the landscape. The interagency Greater Sage-Grouse Wildfire, Invasive Annual Grasses and Conifer Expansion Assessment (Fire and Invasive Assessment Team [FIAT] 2014) under the Proposed Plans prioritizes landscapes for wildfire prevention and suppression, fuels management, and habitat restoration and rehabilitation within key GRSG habitats based on resistance and resilience concepts in Chambers et al. (2014). This management is in accordance with the COT report objective to retain and restore healthy native sagebrush plant communities within the range of GRSG. However, the FIAT does not cover the Sheeprocks population.

Recognition of the importance of sagebrush habitat during interagency wildfire response would benefit GRSG in the event of an unplanned fire. The Utah executive order and conservation plan for GRSG (Utah Greater Sage-Grouse Working Group 2013) are being implemented and emphasize prevention, suppression, and rehabilitation/restoration within SGMAs throughout Utah. Similarly, the State of Nevada is implementing the Wildland Fire Protection Program to improve delivery resources to counties for fuels reduction planning and implementation, wildfire management and suppression and restoration of burned areas (SETT 2014, p. 48). These programs would benefit GRSG during wildfire planning and response throughout MZ III, particularly on lands not administered by the BLM or Forest Service.

The Interagency Standards for Fire and Fire Aviation Operations "Red Book" includes a BMP for GRSG habitat conservation for wildlife and fuels management (BLM 2013b). This document is a

supplemental policy or guidance for the BLM, the Forest Service, and the USFWS. This BMP would benefit the GRSG during interagency wildland fire operations by using spatial habitat data and predictive services to prioritize and preposition firefighting resources in critical habitat areas. In January 2015, Secretarial Order 3336 "Rangeland Fire Prevention, Management and Restoration" was signed by the Secretary of the Interior. The order sets forth strategies for preventing and suppressing rangeland wildfire and for restoring sagebrush landscapes impacted by wildfire across the West. The order will improve coordination with local, state, tribal, and regional efforts to address rangeland wildfire at a landscape level. Coordination with rural fire districts to manage wildfires in GRSG habitat will further reduce this threat across land ownership types and improve the quality and quantity of habitat.

Reasonably foreseeable wildland fire management efforts are projected to increase (**Section 5.4.8**), especially through increased coordination of federal, state, and local fire prevention actions and the implementation of the Nevada and Northeastern California Sub-region BLM and Forest Service LUPA in MZ III. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Spread of Weeds

Nature and Type of Effects. As discussed in **Chapter 4**, invasive weeds alter plant community structure and composition, productivity, nutrient cycling, and hydrology. Invasive weeds also may cause declines in native plant populations, including sagebrush habitat, through such factors as competitive exclusion and niche displacement. Invasive plants reduce and may eliminate vegetation that GRSG use for food and cover. Invasive weeds fragment existing GRSG habitat and reduce habitat quality by competitively excluding vegetation essential to GRSG. Invasive weeds can also create long-term changes in ecosystem processes, such as fire cycles and other disturbance regimes that persist even after an invasive plant is removed (Connelly et al. 2004). Big sagebrush communities invaded by cheatgrass have estimated mean fire-return intervals of less than 10 years in many areas (Connelly et al. 2004), whereas the natural regime is estimated (conservatively) to be 10 to 20 times longer (Manier et al. p. 88).

Roads and recreation can promote the spread of invasive weeds through vehicular traffic. Weed infestations can further exacerbate the fragmentation effects of roadways. Irrigation water has also supported the conversion of native plant communities to hayfields, pasture, and cropland, thus fragmenting sagebrush habitats. Excessive grazing in these habitats can lead to the demise of the most common perennial grasses in this system and an abundance of invasive species such as cheatgrass or Japanese brome (Reisner et al. 2013).

Conditions in the Sub-region and MZ III. Weeds have invaded and will likely continue to invade many locations in MZ III, including the sub-region, via seeds carried by wind, humans, machinery, and animals. Some species, including annual bromes and Canada thistle, have become so ubiquitous throughout the sub-region that it is considered economically unfeasible to attempt to control certain areas, such as those that have crossed a threshold that precludes their returning to traditional plant community composition through normal plant succession. Such species are considered part of the vegetative landscape despite their adverse impacts on other vegetation. Cheatgrass invasion has been widespread in this region for decades, and some former habitats are likely unrecoverable; many of these areas are already excluded from current habitat

distributions (Manier et al. 2013). Modeling has suggested that approximately 4.9 million acres (35 percent) of GRSG habitat in MZ III are considered to be at a moderate to high risk for cheatgrass occurrence (Manier et al. 2013, p. 90); this is particularly a threat after wildfires.

The BLM and Forest Service currently manage weed infestations through integrated weed management, including biological, chemical, mechanical, manual, and educational methods. The BLM is guided by the 1991 and 2007 RODs for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991) and by the 2007 Programmatic Environmental Report (BLM 2007). Weeds are managed in cooperation with county governments and represent a landscape-level approach across management jurisdictions. Similarly, the National Forests in the MZ manage comprehensive weed management programs under individual Noxious Weed Control programs.

Impact Analysis. Management actions in the Utah Sub-region that minimize ground disturbance in GRSG habitat would benefit the species by limiting potential for establishment and spread of invasive plants. Increased activity, such as surface disturbance, motorized transportation, and animal and human activity, would increase the chance for the establishment and spread of invasive plants.

Management under Alternative A would allow for the most acres of surface disturbance within GRSG habitat; therefore, the potential for invasive weed spread and establishment would be greatest under this alternative, and effects on GRSG (e.g. reduction in quality of habitat) would be more pronounced. All of the action alternatives would reduce surface disturbance within GRSG habitat and would include weed-prevention measures to some degree. Under all alternatives, BLM and Forest Service would work closely with local and state agencies to manage and treat weeds on public lands. The BLM and Forest Service would continue to participate in exotic plant pest councils, state vegetation and noxious weed management committees, state invasive species councils, county weed districts, and weed management associations.

Of all alternatives, the Proposed Plans would likely have the lowest potential for invasive weed spread and establishment, given the three percent anthropogenic disturbance threshold which would limit surface disturbance; extensive mitigation and monitoring plans; wildfire and invasive species assessments and subsequent prioritization; application of RDFs; and incorporation of habitat objectives for GRSG. The COT report objective for invasive species is to maintain and restore healthy native sagebrush plant communities; of all the alternatives, the Proposed Plans would best meet this objective.

Relevant cumulative actions that result in surface-disturbing activities, such as ROWs and energy and mining projects, would increase the potential for the spread of invasive weeds on both federal and non-federal lands. Projects requiring state agency review and/or approval would be subject to conditions in both the Nevada and Utah state plans including control of noxious and invasive weed species and use of native seed mixes during reclamation, and the Utah disturbance cap, which would limit anthropogenic disturbances in SGMAs. The Nevada and Utah state plans also address invasive species in fire management. These stipulations would benefit GRSG habitat by limiting the spread or establishment of invasive species, particularly on lands that lack BLM and Forest Service protective regulatory mechanisms.

Reasonably foreseeable weed management efforts are projected to increase (**Section 5.4.8**), including other state and county noxious weed regulations and the implementation of the Nevada and Northeastern California Sub-region BLM and Forest Service LUPA in MZ III. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III. Sheeprocks and Ibapah face particular threats from invasive weeds, but all the GRSG population areas in MZ III would benefit from more effective management and control of weeds in GRSG habitat. The Proposed Plans may result in the greatest net conservation gain due to its three percent anthropogenic disturbance cap that should reduce potential for the spread of weeds during the 20-year analysis period.

Conifer Encroachment

Nature and Type of Effects. Conifer woodlands, especially juniper (*Juniperus* spp.) and in some regions pinyon pine (*Pinus edulis*), may expand into sagebrush habitat and reduce availability of habitat for GRSG. Conifer expansion may be encouraged by human activities, including fire suppression and grazing (Miller et al. 2011). If woodland development is sufficient to restrict shrub and herbaceous understory growth, habitat quality for GRSG will be reduced (Connelly et al. 2004). Mature trees offer perch sites for raptors; thus, woodland expansion may also increase the threat of predation, as with power lines (Manier et al. 2013, p. 91). Locations within approximately 1,000 yards of current pinyon-juniper woodlands are at highest risk of expansion (Bradley 2010). Studies have shown that GRSG incur population-level impacts at very low levels of conifer encroachment (Baruch-Mordo et al. 2013). In the Great Basin (best documented in MZs III, IV, and V), conifer encroachment reduces habitat quality in important seasonal ranges when woodland development is sufficient to restrict shrub and herbaceous production (Connelly and others, 2004 in Manier et al. 2013, p. 91).

Conditions in the Sub-region and in MZ III. Conifer encroachment risk is high on approximately 1.8 million acres (13 percent) of GRSG habitat in MZ III, and approximately 58 percent of conifer encroachment risk in priority habitat (and 76 percent in general habitat) occur on BLM-administered lands within MZ III (Manier et al. 2013, p. 93). In comparison, 17 percent of conifer encroachment risk in priority habitat (and 6 percent in general habitat) occur on private lands and 19 percent in priority habitat occurs on National Forest System lands (17 percent in general habitat). Therefore, BLM actions are likely to have a greater potential to ameliorate the effects of conifer encroachment on GRSG than any other single land management entity.

Impact Analysis. The COT objective is to remove pinyon-juniper from areas of sagebrush that are most likely to support GRSG (post-removal) at a rate that is at least equal to the rate of pinyon-juniper incursion (USFWS 2013a, p. 47). Management under Alternatives B, C, D, and the Proposed Plans would prioritize restoration in GRSG seasonal habitat, by target conifers in these areas for removal. Conifer removal would be targeted to early stage invasions near leks, using the VDDT and FIAT as tools to help refine treatment locations. Alternative E would follow an aggressive program of conifer removal on National Forest System lands in GRSG habitat. The Proposed Plans would also incorporate GRSG habitat objectives to guide conifer encroachment treatments as outlined in the Habitat Objectives tables of the Proposed Plans in **Chapter 2**. Alternative A would not prioritize conifer removal in GRSG habitat on BLM-administered and National Forest System lands in the sub-region, though the cumulative impact

of other past, present, and reasonably foreseeable future actions in the sub-region and larger MZ would help reduce the threat across the MZ III.

Relevant cumulative actions on federal, private, and state lands within the MZ include several large conifer removal projects (**Section 5.4.8**). Further, the NRCS carries out conservation measures to remove encroaching conifers near leks and lek seasonal habitats while minimizing disturbance to GRSG (NRCS 2015). The Sage-Grouse Initiative has helped reduce the threat of early succession conifer encroachment through mechanical removal on 18,885 acres of private lands within MZ III. The majority of these efforts were located inside PACs (NRCS 2015), helping to preserve historic fire return intervals and important GRSG habitat.

Reasonably foreseeable conifer encroachment management efforts are projected to increase (**Section 5.4.8**), including efforts on private land and implementation of the Nevada and Northeastern California Sub-region BLM and Forest Service LUPA in MZ III. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III. The Proposed Plans would have the greatest reduction in the threat from conifer encroachment and provide a net conservation gain to GRSG habitat in the Carbon, Parker, Panguitch, Ibapah, and Bald Hills Population Areas.

Infrastructure

Rights-of-Way

Nature and Type of Effects. As discussed in **Chapter 4**, transmission lines can directly affect GRSG by posing a collision and electrocution hazard. They also can indirectly decrease lek attendance and recruitment by providing perches and nesting habitat for potential avian predators such as golden eagles and ravens (Connelly et al. 2004). In addition, power lines and pipelines often extend for many miles. The ground disturbance associated with construction, as well as vehicle and human presence on maintenance roads, may introduce or spread invasive weeds over large areas, degrading habitat. Impacts from roads may include direct habitat loss from road construction and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats, facilitate predator movements, spread invasive plants, and increase human disturbance from noise and traffic (Forman and Alexander 1998).

Conditions in the Sub-region and in MZ III. Infrastructure, such as ROWs and associated facilities and urbanization, is widespread throughout MZ III. In some locations, infrastructure development has affected GRSG habitat. Development of roads, fences, and utility corridors has also contributed to habitat loss and fragmentation in portions of MZ III. The best available estimates suggest about 17 percent of MZ III is within approximately 4 miles of urban development (Knick et al. 2011, p. 214). Impacts of infrastructure development in MZ III are primarily related to highways, roads, power lines, and communication towers, with 90 percent of MZ V within 4 miles of a road, 14 percent within 4 miles of a power line, and 5 percent within 4 miles of a communication tower (Knick et al. 2011, pp. 215-216).

Although not representative of all infrastructure ROWs, transmission lines greater than 115 kVs indirectly influence 33 percent of priority habitat and 25 percent of general habitat across MZ III. Indirect effects are assumed to occur to a radius of 4 miles (Manier et al. 2013, p. 41).

Approximately 53 percent of transmission lines in priority habitat and 80 percent in general habitat are on BLM-administered lands across GRSG habitats in MZ III (Manier et al. 2013, p. 41). In contrast, private and National Forest System lands contain 32 percent and 6 percent of transmission lines in priority habitat, respectively, and 15 percent and 5 percent in general habitat, respectively. Therefore, BLM actions are likely to have a greater potential to affect transmission line ROWs in GRSG habitat than any other land management entity. In addition, Military Operating Areas in Utah overlap GRSG habitat in the Ibapah, Sheeprocks, and part of Hamlin Valley Population Areas.

Impact Analysis. **Table 5.5**, Acres of Rights-of-Way Designations in GRSG Habitat in MZ III, lists the areas of ROW avoidance and exclusion in GRSG habitat by alternative.

Table 5.5
Acres of Rights-of-Way Designations in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Open to Rights-of-Way				
Alternative A	1,998,000	98%	78,000	0%
Alternative B	29,000	0%	78,000	0%
Alternative C	29,000	0%	78,000	0%
Alternative D	29,000	0%	280,000	72%
Alternative E	29,000	0%	347,000	78%
Proposed Plans	53,000	45%	286,000	73%
Right-of-Way Exclusion				
Alternative A	130,000	15%	256,000	0%
Alternative B	1,975,000	94%	256,000	0%
Alternative C	2,114,000	95%	256,000	0%
Alternative D	130,000	15%	256,000	0%
Alternative E	110,000	0%	275,000	7%
Proposed Plans	118,000	6%	270,000	6%
Right-of-Way Avoidance				
Alternative A	3,676,000	<1%	4,057,000	0%
Alternative B	3,661,000	0%	4,195,000	3%
Alternative C	3,661,000	0%	4,057,000	0%
Alternative D	5,437,000	33%	4,063,000	<1%
Alternative E	5,385,000	32%	4,057,000	0%
Proposed Plans	5,395,000	32%	4,077,000	<1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within ROW designations in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Alternative A (current management) has the most acres open to ROW/SUAs in PHMA. Across MZ III, Alternatives B, C, D, and E would similarly reduce the number of open acres in PHMA, while in GHMA open acres would remain similar for all alternatives except Alternative B, which would reduce open acres.

Under the Proposed Plans, PHMA would be avoidance for high-voltage transmission lines and major pipelines, while GHMA would be open with restrictions. Alternatives A, B, and C would not contribute acres of ROW avoidance within MZ III, as GRSG habitat would be managed as either open (under Alternative A) or ROW exclusion (Under Alternatives B and C). In contrast, Alternatives D and E and the Proposed Plans manage PHMA as ROW avoidance, thereby increasing the acreage compared to Alternative A.

While the Proposed Plans leave the most acres of PHMA open to ROW/SUAs relative to all action alternatives, measures in the Proposed Plans include RDFs, lek buffers, mitigation, and the disturbance cap and 1 facility per 640 acre density cap to reduce impacts on GRSG. Because of the additional protections under the Proposed Plans, this alternative provides the greatest net conservation gain to GRSG habitats and populations in the Utah Sub-region and is most likely to meet the COT report objective, which is to avoid development of infrastructure in PACs.

The number of ROW authorizations are anticipated to increase in the sub-region. Population growth, continued energy development, and new communication sites drive the need for new ROWs on both federal and non-federal lands. For instance, the TransWest Express project would impact GRSG habitat in MZ II/VII and MZ III. Designating ROW exclusion and avoidance areas in PHMA and GHMA on BLM-administered and National Forest System lands could reduce the threat on these lands. However, in areas with scattered federal landownership, infrastructure may be routed around federal lands, often increasing its length and impact. ROW avoidance and exclusion areas on could increase this tendency.

All of the three major alignments of the TransWest Express ROW through the eastern portion of Utah (from the Colorado border to Spanish Fork) would only be able to be completed under Alternative A and the Proposed Plans of this LUPA/EIS. The cumulative impacts for Alternative A would be the same as those described for Alternative A below. Under the GRSG Proposed Plans the TransWest Express ROW has been given an exception, therefore, the Proposed Plans would allow for the northern alignment (northern – Applicant Proposed II-A) for the TransWest Express ROW. Other potential ROWs in a similar alignment would have additional mitigation and conservation measures attached to the ROW grant in order to be permitted under the Proposed Plans. Even though TransWest Express does not have to comply with the restrictions that accompany this Proposed Plans, it would be required to comply with the USDA Forest Service Interim Conservation Recommendations for Greater Sage-Grouse and Greater Sage-Grouse Habitat Forest Service Regions 1, 2, and 4, signed by the Chief of Forest Service in October 2012, and procedures in BLM IM 2012-043. Listed below is a brief summary of the content of these instructional memos:

1. BLM: Provide documentation of reasoning for ROW determinations and to require the ROW holder to implement measures to minimize impacts on GRSG habitat;
2. BLM: In cooperation with respective state wildlife agencies, consider the opportunities for both on–site and off–site mitigation measures to avoid or minimize habitat and population level impacts; and
3. BLM: In cooperation with respective state wildlife agencies, determine that the proposed ROW would cumulatively maintain or enhance GRSG habitat.

4. Forest Service: Promote conservation of sustainable GRSG populations and their habitats while not limiting future options before the plan amendment process can be completed.
5. Forest Service: Promote consistency in management of activities on National Forest System lands with guidance in the IM 2012-043: *Greater Sage-Grouse Interim Management Policies and Procedures* (Dec. 22, 2011).

Since the northern TransWest Express ROW alignment has been given an exception to this LUPA, cumulative impacts from the TransWest Express ROW would be expected to be slightly greater than those of the other alternatives.

All of the three main TransWest Express ROW alignments through northeastern Utah (Applicant Proposed II-A, central – Alternative II-F, and southern – Alternative II-C) will, when the project is finalized, comply with BLM IM 2012-043, however, it is expected that some of the alternatives would add to the cumulative impacts on GRSG more than others due to their inherent impact on GRSG and GRSG habitat. The southern route would avoid GRSG habitat in Utah in its entirety and therefore would not add any to the cumulative impacts of GRSG while the central route would add negligible effects and the Proposed might slightly add to the cumulative impacts on GRSG within MZ II/VII and III in Utah.

Under Alternatives B, C, and D of this LUPA/EIS the northern alignment of the TransWest Express ROW would not be allowed since GRGS habitat is an exclusion area within PHMA for ROWs and therefore TransWest Express would need to completely avoid the areas. All GRSG habitat is avoidance for ROWs under Alternative E; therefore, it would be more difficult for the TransWest Express ROW to be authorized. Cumulatively, the impact of TransWest Express under any of these four alternatives would be minimal to GRSG since the ROW would most likely be forced to avoid the habitat completely or provide a net conservation gain for GRSG habitat and populations.

Alternative II-F (central route) would go through Deadman's Bench and the northeastern portion of the Anthro portion of the Carbon Population Area. These two portions of GRSG habitat are considered fairly poor habitat and this alignment in all alternatives, except for Alternative C, are identified as GHMA in this LUPA/EIS. TransWest Express would parallel another high voltage power line and Highway 40 as it would cross Deadman's Bench (both the northern and central alignments) and continue south along the western edge of the GRSG habitat. The ROW would then run north of the Emma Park portion of the Carbon Population Area, which is identified as PHMA in all alternatives. Because the ROW travels through a portion of PHMA that is already heavily impacted by other infrastructure including power lines and crosses north of most of the Emma Park habitat some additional impacts will likely occur but will be localized to the habitat and not impact the Carbon population. The ROW north of Emma Park could be located to minimize impacts on GRSG.

New ROW authorizations that require state agency review or approval would be subject to stipulations for development under both the Nevada and Utah state conservation plans for GRSG. These stipulations would benefit GRSG by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from ROW developments.

The effect of the alternatives and other conservation actions in the MZ (most notably the Utah executive order) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. By implementing restrictions on infrastructure in PHMA and on state and private lands together, the cumulative beneficial effect on GRSG would be greater than the sum of their individual effects because protections would be applied more consistently across the landscape. This is especially important in areas of mixed land ownership patterns where complementary protections can benefit leks, early brood rearing habitat, or other important areas that do not follow geopolitical boundaries.

Reasonably foreseeable ROW development in MZ III is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat by restricting the type and location of developments. When restrictions in the Utah LUPA are added to these conservation actions, the impacts of future ROW developments would be further reduced. The Proposed Plans would provide the greatest net conservation gain to GRSG habitats and populations in MZ III by providing the flexibility to site ROWs with the least impact on GRSG habitat.

Renewable Energy

Nature and Type of Effects. Impacts on GRSG from renewable energy development, such as that for wind and solar power, are similar to those from nonrenewable energy development. Additional concerns associated with wind energy developments are rotor blade noise, structure avoidance, and mortality caused by collisions with turbines (Connelly et al. 2004).

Conditions in the Sub-region and in MZ III. While Utah does not have solar potential in GRSG habitat, wind energy development is an increasing threat in some populations. While ROW applications for wind testing or development are under NEPA review within MZ III, at this time, no wind developments have been authorized or constructed in MZ III, and there is currently no utility-scale wind energy development within occupied GRSG habitat in Utah. However, high wind potential exists on 35,500 acres of occupied GRSG habitat, mainly within the Carbon and Hamlin Valley population areas, as well as the Rich Population Area in MZ II.

Geothermal energy development is discussed under *Energy Development and Mining*, below.

Impact Analysis. **Table 5.6**, Acres of Wind Energy Management Designations in GRSG Habitat in MZ III, lists areas of wind energy ROW by alternative.

In the Utah Sub-region, the action alternatives do not contribute to the acres open for wind energy development in GRSG habitat in MZ III. Similarly, Alternatives B, C, and D and the Proposed Plans do not contribute to wind avoidance acres in PHMA in MZ III. The Proposed Plans exclude wind energy development in PHMA. All action alternatives would increase wind exclusion acres in PHMA in MZ III, with exclusion acres highest under Alternative C, which would reduce potential impacts on GRSG on BLM-administered lands and National Forest System lands the most.

Table 5.6
Acres of Wind Energy Management Designations in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Open to Wind Rights-of-Way				
Alternative A	1,969,000	100%	0	0%
Alternative B	0	0%	0	0%
Alternative C	0	0%	0	0%
Alternative D	0	0%	201,000	100%
Alternative E	0	0%	269,000	100%
Proposed Plans	3,000	100%	193,000	100%
Wind Right-of-Way Exclusion				
Alternative A	3,820,000	1%	256,000	0%
Alternative B	5,666,000	33%	256,000	0%
Alternative C	5,804,000	35%	256,000	0%
Alternative D	5,596,000	32%	262,000	2%
Alternative E	3,801,000	0%	276,000	7%
Proposed Plans	5,564,000	32%	273,000	6%
Wind Right-of-Way Avoidance				
Alternative A	15,000	100%	4,134,000	0%
Alternative B	0	0%	4,272,000	3%
Alternative C	0	0%	4,134,000	0%
Alternative D	0	0%	6,136,000	<1%
Alternative E	1,724,000	100%	4,134,000	0%
Proposed Plans	0	0%	4,134,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within wind energy management designations in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Alternative A would leave the most GRSG habitat open to wind ROWs, and would thereby have the greatest potential impact on GRSG and their habitat. Alternative D would designate PHMA as ROW exclusion for utility-scale wind projects. Alternative E would not exclude these projects in GRSG habitats, but they would be avoidance areas.

The Proposed Plans would manage PHMA and GHMA as exclusion for utility-scale solar facilities, and PHMA as exclusion for commercial wind facilities (see below). GHMA would be ROW avoidance for wind facilities. Wind developments would also be subject to the anthropogenic disturbance criteria, a three percent disturbance cap and 1 facility per 640 acre density cap, RDFs, buffers, and a mitigation requirement. The Proposed Plans would reduce potential impacts on GRSG relative to the No Action alternative and other action alternatives.

New ROW authorizations that require state agency review or approval would be subject to stipulations for development in GRSG Management areas under the Utah state conservation plan for GRSG as discussed above.

Implementation of the wind energy restrictions in the Utah Sub-region Proposed Plans, in combination with the Nevada and Utah state plans for GRSG conservation, ROW exclusion areas in other BLM and Forest Service LUPAs, and other past, present, and reasonably foreseeable future actions, would provide a net conservation gain to GRSG habitats and populations in MZ III.

Projects that require state agency review or approval would be subject to the Utah and Nevada state plans for GRSG conservation. This would encourage wind energy development outside of SGMAs and Core Habitat. Reasonably foreseeable renewable energy development in MZ III is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state GRSG conservation efforts as well as wind energy restrictions in the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat by restricting the location of developments. When restrictions in the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Grazing/Free Roaming Equids

Nature and Type of Effects. In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. As a result, livestock grazing could cause changes in habitat that alter species abundances and composition in GRSG insect prey. Changes in plant composition could occur in varying degrees and could change vegetative structure, affecting cover for nesting birds. Grazing could also alter fire regimes (Davies et al. 2010).

If not managed properly, cattle and sheep grazing can compact soil, enrich soil with nutrients, trample vegetation and nests, directly disturb GRSG, and decrease habitat effectiveness and eventually affect GRSG recruitment. Cattle and sheep also can reduce invertebrate prey for GRSG or increase their exposure to predators (Beck and Mitchell 2000, pp. 998-1,000; Knick 2011; Coates 2007, pp. 28-33). Grazing in riparian areas can destabilize streams and riverbanks, cause the loss of riparian shade, and increase sediment and nutrient loads in the aquatic ecosystem (George et al. 2011). Stock watering tanks can contribute to stream and aquifer dewatering and may concentrate livestock movement and congregation in sensitive areas (Vance and Stagliano 2007).

Even periodic overgrazing can damage range resources over the long term. Grazing often exacerbates drought effects when stocking levels are not quickly reduced to match the limited forage production. The degree to which grazing affects habitat depends on several factors, such as the number of animals grazing in an area, the time, duration and intensity of grazing, and the grazing system used.

However, grazing can be used to reduce fuel load and reduce the risk of wildfire (Connelly et al. 2004, p. 7, 28-30). Under certain conditions, grazing can reduce the spread of invasive grasses, if applied early in the season before the grasses have dried (Strand and Launchbaugh 2013). Light to moderate grazing does not appear to affect perennial grasses, which are important to nest cover (Strand and Launchbaugh 2013). However, excessive grazing can eliminate perennial grasses and lead to expansion of invasive species such as cheatgrass or Japanese brome (*Bromus japonicus*) (Reisner et al. 2013).

A well-developed understory of grass, forbs, and deciduous shrubs is critical for GRSG and other wildlife. Impacts on habitat vary with livestock densities and distribution; the more evenly livestock is distributed, the lower its impact on any given area (Gillen et al. 1984). However, cattle show a strong preference for certain areas, leading to high use in some areas and little to no use in others. Livestock grazing is generally limited by slopes of greater than 30 percent, dense forests and vegetation, poor or little upland forage, and lack of water.

Since the passage of the 1934 Taylor Grazing Act, range conditions have improved due to improved grazing management practices and decreased livestock numbers and annual duration of grazing.

In addition, the BLM has applied Standards for Rangeland Health since 1997. On National Forest Systems lands, livestock grazing is administered in accordance with a number of laws and regulations, including the Multiple Use and Sustained Yield Act of 1960, Granger-Thye Act of 1950, and Organic Administration Act of 1897. The purpose of these regulations is to enhance sustainable livestock grazing and wildlife habitat, while protecting watersheds and riparian ecosystems.

Although livestock grazing is the most widespread land use across the sagebrush biome, it exerts a more limited influence on soils and vegetation than land uses that remove or fragment habitat (e.g., mineral extraction or infrastructure development). GRSG are able to co-exist with grazing animals when properly managed. Thus, reducing AUMs or acres open to grazing would not necessarily restore high-quality GRSG habitat with efforts to enhance habitats.

Reduced grass height caused by livestock grazing in GRSG nesting and brood-rearing areas has been shown to decrease habitat effectiveness and impact nesting success. Livestock grazing could reduce the suitability of breeding and brood-rearing habitat, which would impact GRSG populations (USFWS 2010).

For BLM-administered lands, Standards for Rangeland Health require the BLM to ensure that the environment contains all of the necessary components to support persistent populations of sensitive, threatened, and endangered species in a given area relative to site potential. The BLM Washington Office IM 2009-018 requires that land health considerations, such as vegetation cover for GRSG, are primary considerations for prioritizing the processing of grazing authorizations.

Livestock grazing impacts wildlife habitats, including habitats for numerous special status species. Potential impacts from livestock grazing would be minimized by managing BLM-administered lands to meet Standards for Rangeland Health, closing areas that fail to meet these standards, or changing grazing seasons and livestock numbers if grazing were a cause of the area's failure to meet Standards for Rangeland Health.

On National Forest System lands, an "Approach to Determine the Health and Functionality on Rangelands in the United States" was chartered in the Intermountain Region in conjunction with the Rocky Mountain Research Station's Forest Inventory and Assessment project. Two related descriptive concepts, "range health" and "properly functioning condition of rangelands influenced this project and resulted in the identification of four indicators that appear to address

major rangeland health and functionality questions at a broad scale: 1) noxious weeds, 2) ground cover, 3) shrub cover, 4) species composition. Range improvements could result in livestock overusing important GRSG areas. For example, developing springs would generally change vegetative composition from a high diversity of grasses and forbs, important to broods, to one dominated by grasses; conversely, in areas where livestock use was not well-managed, invasive forbs would rise in prevalence.

Concentrated livestock use would remove standing vegetation and subsequently reduce associated insects and forbs, both of which are important to GRSG broods. Allowing spring developments along ephemeral streams and wetlands and allowing livestock watering tanks would decrease GRSG habitat. Springs, seeps, and wetland areas are vitally important to GRSG broods; therefore, allowing spring developments could reduce resources for GRSG.

Conditions in the Sub-region and in MZ III. Livestock grazing is present and widespread across MZ III. In 2006, rangeland health assessments found that 1.6 million acres of GRSG habitat on BLM-administered GRSG habitat in MZ III (17 percent) did not meet wildlife standards due to grazing impacts (Manier et al. 2013, p. 97). Additionally, over 4 million acres (29 percent) of GRSG habitat within MZ III is federally managed wild horse and burro range (Manier et al. 2013, p. 102), mostly in central Nevada; horse and burro herbivory have been connected to intense resource use and measureable effects on range conditions and habitat quality (Beever and Aldridge 2011).

Perhaps the most pervasive change associated with grazing management in GRSG habitats throughout MZ III is the construction of fencing and water developments (Knick et al. 2011, p. 224). Barbed wire fences contribute to direct mortality through fence collisions (Stevens et al. 2011); water developments may contribute to the increased occurrence of West Nile virus (Walker and Naugle 2011).

Additional habitat modifications associated with grazing management are mechanical and chemical treatments to increase grass production, often by removing sagebrush (Knick et al. 2011). Standards for Rangeland Health protect habitat from elements detrimental to GRSG, but not all rangelands in MZ III comply with these standards as discussed above.

Wild horses also occur on BLM-administered lands within MZ III and the sub-region; within MZ III, nearly 25 percent of priority habitat and 41 percent of general habitat is adversely influenced by free-roaming equids (Manier et al. 2013, p. 102).

Impact Analysis. In the sub-regional decision area, the BLM manages livestock grazing on 4,463,800 acres encompassing approximately 389 grazing allotments. The Forest Service manages 790,200 acres on an additional 179 grazing allotments (**Section 3.16**, Livestock Grazing/Range Management). **Table 5.7**, Acres Available and Unavailable for Livestock Grazing in GRSG Habitat in MZ III, lists the acres of PHMA and GHMA available and unavailable for grazing in MZ III, by alternative.

Table 5.7
Acres Available and Unavailable for Livestock Grazing in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Available to Livestock Grazing				
Alternative A	5,763,000	34%	4,377,000	0%
Alternative B	3,798,000	0%	4,514,000	3%
Alternative C	3,798,000	0%	4,377,000	0%
Alternative D	3,798,000	0%	4,583,000	4%
Alternative E	3,798,000	0%	4,664,000	6%
Proposed Plans	5,526,000	31%	4,618,000	5%
Unavailable to Livestock Grazing				
Alternative A	0	0%	0	0%
Alternative B	0	0%	0	0%
Alternative C	1,964,000	100%	0	0%
Alternative D	0	0%	0	0%
Alternative E	0	0%	0	0%
Proposed Plans	0	0%	0	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA available and unavailable to livestock grazing in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Acres available to livestock grazing in PHMA are similar to Alternative A across most alternatives, with the exception of Alternative C (C1 makes PHMA unavailable to livestock grazing; C2 reduces PHMA available to grazing relative to Alternative A by approximately 70 percent). Acres unavailable to livestock grazing would be greatest under Alternative C. Such a closure would benefit GRSG by maintaining herbaceous understory cover for nesting, predator protection and forage; however, the increased need for fencing to exclude grazing animals could also impact nesting GRSG, by increasing the likelihood of predation and collision. Thus, Alternative C could result in higher cumulative effects on GRSG populations through removal of grazing, including mortality from fencing collisions, predation, and potential for increased wildfire from fuel loading.

Because moderate grazing is compatible with GRSG habitat (Strand and Launchbaugh 2013), closing acres to grazing may not itself benefit or harm GRSG. Potentially more beneficial is restricting range improvements in GRSG habitat, limiting fencing, and effectively implementing range health standards and Forest Plan guidance on grazing allotments in GRSG habitat. Alternatives B, D, and E, and the Proposed Plans include grazing guidelines which would help protect GRSG from potential impacts from habitat changes due to herbivory and collisions with fencing. Forest Service Plan guidance would not allow adverse effects that result in impacts on GRSG persistence across a National Forest. In terms of impacts on BLM-administered and National Forest System lands, Alternative A would have no GRSG-specific protective grazing restrictions, and would therefore have the greatest impacts on the species.

The COT report objectives for livestock grazing are to manage grazing in a manner consistent with local ecological conditions. This management would maintain or restore healthy sagebrush shrub and native perennial grass and forb communities and conserve essential habitat components for GRSG. Restoration to meet these standards and adequate monitoring would be required. The COT report also states that land managers should avoid or reduce the impact of range management structures on GRSG habitat.

If BLM-administered and National Forest System lands were made unavailable for livestock grazing, as under Alternative C1, this could increase grazing pressure on adjacent private lands. Loss of federal grazing permits would pose a threat of indirect adverse effects, including potential conversion of private grazing lands to agriculture, if the loss of federal grazing privileges made ranching less economically viable.

Since 2010, the Sage-Grouse Initiative has enhanced rangeland health through rotational grazing systems, re-vegetating former rangeland with sagebrush and perennial grasses and control of invasive weeds. On privately owned lands, the Sage-Grouse Initiative has developed a prescribed grazing approach that balances forage availability with livestock demand. This system allows for adjustments to timing, frequency, and duration of grazing, ensuring rangelands are managed sustainably to provide continued ecological function of sagebrush-steppe. A primary focus of the prescribed grazing approach is maintenance of key plant species, such as deep-rooted perennial grasses that have been shown to be essential for ecological resistance to invasive annual grasses (Reisner et al. 2013, pp. 1047-1048). These actions help to alleviate the adverse impacts associated with improper grazing practices outlined above under *Nature and Type of Effects*. Within MZ III, the Sage-Grouse Initiative has implemented 37,557 acres of prescribed grazing systems and marked 10 miles of fences within MZ III. This program is likely the largest and most impactful program on private lands within MZ III. Because of its focus on PACs, which often overlap PHMA, the Sage-Grouse Initiative's past, present, and reasonably foreseeable work has had and likely will continue to have a cumulative beneficial impact on GRSG when considered alongside protective BLM and Forest Service management actions in PHMA.

In combination with NRCS actions under the Sage-Grouse Initiative (e.g., fence marking and conservation easements), state efforts to maintain ranchland, other past, present, and reasonably foreseeable future actions, and other BLM and Forest Service Proposed Plans in MZ III, BLM and Forest Service management actions in the Utah Sub-region would provide a net conservation gain to GRSG habitats and populations.

Reasonably foreseeable livestock grazing management efforts in MZ III are expected to increase over the analysis period (**Section 5.4.8**), through increased NRCS conservation actions under the Sage-Grouse Initiative (e.g., fence marking and conservation easements), state efforts to maintain ranchland, and the implementation of the Nevada and Northeastern California Sub-region BLM and Forest Service LUPA in MZ III. When grazing management within the Utah LUPA is added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Under all alternatives, the BLM and Forest Service have the ability to adjust AML of wild horses if resource damage occurs. Alternatives B, D, and E, and the Proposed Plans would manage wild horses and burros within AMLs, while Alternative C (C2) would reduce AMLs by 25 percent. All

the action alternatives would prioritize gathers and development of herd management plans in GRSG habitat. Management under Alternatives B, D, and E, and the Proposed Plans would benefit GRSG more than current management under Alternative A.

Reasonably foreseeable wild horse management efforts are projected to increase over the analysis period (**Section 5.4.8**) with implementation of the Nevada and Northeastern California Sub-region BLM and Forest Service LUPA in MZ III. Other past, present, and reasonably foreseeable future actions are unlikely to affect the threat from wild horses and burros, as these animals are federally managed. When wild horse management within the Utah LUPA is added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III. Impacts may be reduced to the greatest extent under the Proposed Plans, where AMLs would be evaluated with consideration of GRSG habitat objectives for BLM-administered and National Forest System lands.

Conversion to Agriculture/Urbanization

Nature and Type of Effects. Converting sagebrush habitat to agricultural use, commonly referred to as sodbusting, causes a direct loss of available habitat for GRSG. Habitat loss also decreases the connectivity between seasonal habitats, increasing population isolation and fragmentation. Fragmentation then increases the probability for decline of the population, reduced genetic diversity, and extirpation from stochastic events (Knick and Hanser 2011).

In addition to reducing the land area available to support GRSG, habitat loss and fragmentation also increase the likelihood of other disturbances, such as human traffic, wildfire, and invasive plant spread.

Conversion to cropland has generally eliminated or fragmented sagebrush on private lands in areas with deep fertile soils or irrigation potential. Sagebrush remaining in these areas has been limited to the agricultural edge or to relatively unproductive environments.

Although urbanized areas occur throughout the range of GRSG, the direct footprint of urbanized areas is relatively small (Manier et al. 2013, p. 31). However, the indirect impacts associated with urbanized areas have a greater impact on GRSG populations; indirect impacts extend up to 4.3 miles beyond the footprint of urbanized areas. Direct and indirect impacts from urbanization suggest localized potential impacts, as opposed to widespread potential impacts, may be realized from, for example, agricultural conversion (Manier et al. 2013, p. 31).

Development of rural areas is also widespread, particularly along major highways and around urban centers (Knick and Connelly 2011 in Manier et al. 2013, p. 31). Though sagebrush habitats are not generally completely removed by development in rural areas, the resulting fragmentation, disturbance from human dwellings, and other activities likely make these remnant habitats unsuitable for GRSG (Connelly et al. 2004, p. 7-26).

Roads, railways, power lines, and communications corridors surrounding and connecting urban centers also contribute direct and indirect impacts on GRSG and GRSG habitat, including direct mortality from collision or electrocution, increased predation, habitat degradation or loss and fragmentation, spread of invasive plants, and noise.

Conditions in the Sub-region and in MZ III. Regional assessments estimate that while less than 1 percent of priority habitat and general habitat in MZ III are directly influenced by agricultural development, 81 and 71 percent of priority habitat and general habitat, respectively, are within approximately 4 miles of agricultural land and are therefore adversely indirectly affected (Manier et al. 2013, p. 27).

There are nearly 64,000 acres of urbanized areas on private lands on priority habitat and general habitat in MZ III, representing 90 percent of all urbanized areas in GRSG habitat within MZ III (Manier et al. 2013, p. 33). In comparison, there are only 6,300 acres of urbanized areas on BLM-administered surface. Private lands are the largest contributor to direct effects from this threat.

In terms of indirect influence of urbanized areas, Manier et al. (2013, p. 31) estimates that indirect impacts from urbanization extend 4.3 miles from the development footprint, representing the spatial foraging scale of avian predators that may be attracted to urban areas. Therefore, indirect impacts from private lands affect nearly 600,000 acres (and contribute 55 percent of impacts to) GRSG habitat in MZ III. BLM-administered lands affect over 300,000 acres (and contribute 30 percent of impacts to) GRSG habitat in MZ III (Manier et al. 2013, p. 33). Direct and indirect impacts from urbanization on all land ownerships affect approximately 8 percent of GRSG habitat in MZ III.

The COT report identifies urbanization as a threat to only one population of GRSG in MZ III; the Bald Hills portion of the South Central Utah population (USFWS 2013a, p. 21). This population is located in an area constrained by vegetation fragmentation and human development (USFWS 2013a, p. 73).

Impact Analysis. The BLM and Forest Service do not convert public lands to agriculture. As such, the only direct authority these agencies have over conversion to agriculture is by retaining or disposing of lands in the realty program. Lands retained under BLM and Forest Service management will not be converted to agriculture and disposing of lands could increase the likelihood they will be converted to agriculture, depending on their location and new management authority. The COT report objectives for converting land to agriculture are to avoid further loss of sagebrush habitat for agricultural activities and to prioritize restoration.

As shown in **Table 5.8**, Acres Identified for Retention and Disposal in GRSG Habitat in MZ III, acres of GRSG habitat identified for retention across MZ III are similar across Alternatives A and E and the Proposed Plans.

In PHMA and GHMA, Alternatives A through E would identify similar acres for retention, and Alternatives B, C, and D, and the Proposed Plans would not identify any PHMA for disposal. Under the action alternatives, the BLM and Forest Service would generally retain GRSG habitat, thereby eliminating the possibility that GRSG habitat would be converted to agriculture use. Current land tenure adjustment criteria include retaining lands supporting threatened and endangered species and species of high interest, which would mean that GRSG habitat would likely be retained under Alternative A. Alternatives B, C, and D, and the Proposed Plans specifically consider GRSG habitat in land tenure adjustment criteria, which would meet the

Table 5.8
Acres Identified for Retention and Disposal in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Acres Identified for Retention				
Alternative A	3,800,000	0%	4,159,000	0%
Alternative B	3,803,000	<1%	4,159,000	0%
Alternative C	3,806,000	<1%	4,159,000	0%
Alternative D	3,803,000	<1%	4,159,000	0%
Alternative E	3,800,000	0%	4,401,000	0%
Proposed Plans	5,566,000	32%	4,401,000	6%
Acres Identified for Disposal				
Alternative A	6,000	100%	231,000	0%
Alternative B	0	0%	234,000	1%
Alternative C	0	0%	231,000	0%
Alternative D	0	0%	234,000	1%
Alternative E	4,000	100%	233,000	1%
Proposed Plans	0	0%	231,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA identified for retention and disposal in MZ III; it also displays the percentage of those acres that are found within the sub-region.

COT objective for agricultural conversion. Alternative C would include 15 new ACECs and Zoological Areas for protection of GRSG. These areas would be retained under BLM and Forest Service management and thus would not be converted to other uses, such as agriculture or urbanization. Beneficial impacts on GRSG would likely be greatest under the Proposed Plans, which would retain GRSG habitat unless there is a net conservation gain or no adverse impacts from disposal. Furthermore, under the Proposed Plans, GRSG habitat on private lands would be actively located and targeted for acquisition, and if acquired, managed as either PHMA or GHMA.

Land tenure adjustments require site-specific NEPA analysis, and land sales must meet the disposal criteria under applicable law. BLM and Forest Service land tenure adjustments are not anticipated to be a significant contributing element to the threat of agricultural conversion.

The NRCS Sage-Grouse Initiative program focuses on maintaining ranchland that provides habitat for GRSG. This voluntary program provides private landowners with monetary incentives to protect GRSG habitat, often through conservation easements. As a result, private land containing GRSG habitat is protected from conversion to agriculture or other development for the life of the conservation agreement. The conservation easements and other conservation incentives such as restoration of water features and fence marking can enhance the ability of private ranchlands to support GRSG. As of 2014, the Sage-Grouse Initiative has secured conservation easements on 11,191 acres within MZ III and marked or removed 10 miles of fence (NRCS 2015). This has preserved habitat and reduced the risk of direct mortality on these lands.

Additional actions within the sub-region include agricultural restoration or modification for benefit of GRSG, including establishing upland brood rearing habitat, or "brood strips." Upland brood strips are areas established to maximize insect and forb production for young gallinaceous birds including GRSG. These areas are planted to both native and introduced legumes and other preferred forbs in linear or sinuous strips at the edges of existing cropland, hayland, and pastureland (Danvir 2002).

Over the analysis period, conversion to agriculture is expected to increase (**Section 5.4.8**), though state and private conservation efforts as well as implementation of the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat. When land tenure decisions within the Utah LUPA are added to these conservation actions, this would result in net conservation gain to GRSG habitats and populations in MZ III.

Energy Development and Mining

The COT report states that energy development should be designed to ensure that it will not impinge on stable or increasing GRSG population trends. For mining, the COT report objective is to maintain stable to increasing GRSG populations and no net loss of GRSG habitats in areas affected by mining (USFWS 2013a, p. 49).

There are approximately 1,580,100 acres of GRSG habitat in MZ III where energy and mineral development (including oil and gas, geothermal, coal, mineral materials, and nonenergy leasable minerals) is presently occurring. There are 7,028,600 acres indirectly influenced by energy development (including oil and gas, coal, and mineral materials; indirect effects were not quantified for geothermal and nonenergy leasable mineral developments) (Manier et al. 2013, pp. 52-71).

Oil and Gas

Nature and Type of Effects. As discussed in **Section 4.3**, oil and gas development impacts GRSG and sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors. Indirect disturbances result from noise, vehicle traffic, gaseous emissions, changes in water availability and quality, and human presence. These factors could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005), or influence habitat quality, predator communities, and disease dynamics (Naugle et al. 2011).

Conditions in the Sub-region and in MZ III. There is currently relatively little oil and gas development within MZ III, with approximately 2,000 acres of priority habitat directly impacted throughout the MZ (Manier et al. 2013, p. 52) and approximately 571,000 acres (4 percent) of GRSG habitat are leased but undeveloped (Manier et al. 2013, p. 55). The RFD scenario for oil and gas is detailed in **Appendix R**. Fluid mineral development would likely be concentrated where there are existing leases, including the Carbon Population Area and parts of Emery and Strawberry. Additional oil and gas development is expected in Railroad Valley, Nevada, which has a high potential for oil and gas (Appendix Q of the Nevada and Northeastern California LUPA).

Oil development-related wells on BLM-administered lands indirectly influence 38 percent of priority habitat and 80 percent of general habitat across MZ III occurring to a distance of 12 miles from the development. Private surface lands account for 40 percent of indirect effects in priority habitat and 17 percent in general habitat in MZ III (Manier et al. 2013, p. 52). The Forest Service does not have any direct or indirect effects within this MZ. Thus, actions on BLM-administered lands within MZ III have a somewhat greater potential to ameliorate the adverse impacts of oil and gas development on GRSG habitat than do similar conservation actions on private lands.

Well densities are currently low compared to other WAFWA MZs, and current energy developments in eastern portions of the MZ are not widespread; however, more than 1.8 million acres (13 percent) of the GRSG habitats in the MZ are currently leased for federal fluid mineral development, suggesting increased pressure from energy development in the future (Manier et al. 2013).

Although oil and gas activities have a disproportionately greater effect on private lands, regulatory mechanisms on both federal surface and split estate lands in MZ III are influential. Split estate lands with federal subsurface minerals may provide mitigation for impacts on GRSG habitat on private surface lands that would not otherwise be required on lands with both privately held surface.

Impact Analysis. **Table 5.9**, Acres Open and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ III, and **Table 5.10**, Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ III, provide a quantitative summary of fluid mineral leasing conditions on BLM-administered and National Forest System lands across MZ III, followed by an analysis of the Utah Sub-regional alternatives.

As shown in **Table 5.9** and **Table 5.10**, fluid mineral closures and stipulations within the Utah Sub-region exert a substantial influence to closures or stipulations within MZ III as a whole. All action alternatives would provide protection to GRSG in the MZ by closing PHMA to new leases (with standard stipulations). This would reduce well density and impacts associated with construction and operation. Alternatives B and C would close PHMA to new fluid mineral leasing. Alternatives D and E and the Proposed Plans would not close more PHMA than Alternative A. However, Alternatives D and E and the Proposed Plans would impose NSO stipulations in PHMA, and CSU limitations in GHMA. The Proposed Plans would provide additional protections to GRSG from fluid mineral development by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap and 1 facility per 640 acre density cap, buffers, mitigation requirements (**Appendix D**, Mitigation Strategy Utah Greater Sage-Grouse LUPA), and RDFs (**Appendix G**).

All BLM and Forest Service Proposed Plans within MZ III include RDFs to minimize impacts on GRSG from oil and gas development on federal lands. In areas where mineral estate is currently unleased, these tools can be applied to future leases; in areas that are already leased, BMPs can be applied as COAs for development of existing leases. Examples include locating new compressor stations outside of PHMA to reduce noise disturbance; clustering operations and facilities as closely as possible; placing infrastructure in already disturbed locations where the

Table 5.9
Acres Open* and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Open* to Fluid Mineral Leasing				
Alternative A	915,000	100%	0	0%
Alternative B	0	0%	90,000	100%
Alternative C	0	0%	0	0%
Alternative D	0	0%	0	0%
Alternative E	0	0%	131,000	100%
Proposed Plans	0	0%	129,000	100%
Closed to Fluid Mineral Leasing				
Alternative A	187,000	41%	256,000	0%
Alternative B	2,278,000	95%	256,000	0%
Alternative C	2,463,000	96%	256,000	0%
Alternative D	173,000	36%	262,000	2%
Alternative E	153,000	27%	284,000	10%
Proposed Plans	164,000	32%	274,000	7%

Source: BLM 2015
*Open with standard lease terms and conditions. This table displays the acres of PHMA and GHMA open and closed to fluid mineral leasing in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Table 5.10
Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
NSO Stipulations				
Alternative A	4,154,000	11%	33,000	0%
Alternative B	3,690,000	0%	15,000	100%
Alternative C	3,690,000	0%	33,000	0%
Alternative D	4,842,000	24%	25,000	100%
Alternative E	4,222,000	13%	35,000	100%
Proposed Plans	5,692,000	35%	33,000	100%
CSU/TL Stipulations				
Alternative A	577,000	100%	3,690,000	0%
Alternative B	0	0%	4,166,000	1%
Alternative C	0	0%	3,690,000	0%
Alternative D	859,000	100%	4,382,000	6%
Alternative E	1,431,000	100%	4,229,000	2%
Proposed Plans	0	0%	4,205,000	2%

Source: BLM 2015
This table displays the acres of PHMA and GHMA with NSO Stipulations and CSU/TL Stipulations in MZ III; it also displays the percentage of those acres that are found within the sub-region.

habitat has not been fully restored; and restoring disturbed areas at final reclamation to the pre-disturbance landforms and desired plant communities. State plans contain similar measures to reduce impacts. Together, these measures would help protect unfragmented habitats, minimize habitat loss and fragmentation, and maintain conditions that meet GRSG life history needs.

New leasing authorizations that require state agency review or approval would be subject stipulations for development under both the Nevada and Utah state conservation plans for GRSG. These stipulations would benefit the GRSG in Core, Priority, and General Habitats (Nevada) and SGMAs (Utah) by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from fluid mineral developments on non-federal land.

Restoring disturbed habitats would require the reestablishment of native shrubs and forbs, including big sagebrush, which would benefit GRSG; however, restored habitats may not support GRSG for long periods following restoration (Arkle et al. 2014). For this reason, successful restoration may not be successful without a nearby source population.

The effect of the alternatives and other conservation actions in the MZ (most notably the Utah executive order) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. For example, applying buffers in PHMA and on state and private land would effectively conserve larger blocks of land than if these actions occurred individually. This would provide a landscape-scale net conservation benefit, especially in areas where little development has occurred to date.

Reasonably foreseeable oil and gas development in MZ III is widespread and expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain due in large part to implementation of NSO stipulations, anthropogenic disturbance caps, and adaptive management that would minimize future disturbances to GRSG habitats and populations in MZ III.

Geothermal

Nature and Type of Effects. Impacts on GRSG from geothermal development are not well documented since geothermal development has been too recent to identify any immediate or lag effects (Knick et al. 2011 in Manier et al. 2013, p. 70). However, geothermal development is similar to fluid mineral development and direct impacts on habitats would occur from development of power plants, access roads, pipelines, and transmission lines. As a result, impacts of geothermal developments to GRSG from direct habitat loss, habitat fragmentation via roads and transmission lines, noise, and increased human presence (Connelly et al. 2004) may be similar to those discussed for nonrenewable energy development. Comparable effects on local GRSG populations are also anticipated (Manier et al. 2013, p. 70). Other concerns related to geothermal energy development include air and water pollution, disposal of hazardous waste, land subsidence, and release of toxic gases into the environment (Manier et al. 2013, p. 70).

Conditions in the Sub-region and MZ III. While geothermal energy development potential is high throughout MZ III, geothermal leases currently directly affect only 125,600 acres (less than 1

percent) of GRSG habitats in the MZ (Manier et al. 2013, p. 71). There are no geothermal energy production facilities within GRSG habitat in the sub-region, and future development of geothermal resources within GRSG habitat in the sub-region is unlikely.

Impact Analysis. There is high potential for new geothermal development over the next 20 years under Alternative A throughout the sub-region on both BLM-administered and National Forest System lands. Under the RFD scenario for the action alternatives, estimated disturbance would generally decrease between 0 and 70 percent, relative to Alternative A above. The potential for impacts would be reduced where areas are closed to fluid mineral leasing and where NSO and CSU/TL stipulations are applied. Given the small acreage and implementation of RDFs (**Appendix G**), the likelihood for impacts on GRSG habitat is anticipated to be small and localized under all alternatives, including Alternative A.

Coal

Nature and Type of Effects. Besides oil and natural gas development, the major mining activity within GRSG habitat range-wide has been coal (Braun 1998). Coal mining and the use of coal to produce electricity has environmental impacts. These include soil erosion, dust, noise, water pollution, acid-mine drainage, and air emissions, in addition to impacts on wildlife in the area. Burning coal releases toxic fumes and particulate matter into the atmosphere and contributes to climate change (Manier et al. 2013, pp. 69-71). Development of surface mines and associated infrastructure (such as roads and power lines), noise, and human activity may negatively impact GRSG numbers (Braun 1998).

Conditions in the Sub-region and in MZ III. Potential for coal within the Great Basin region is generally lower than in eastern parts of GRSG range. However, coal potential is high in eastern areas (Utah) of MZ III (Manier et al. 2013, p. 132), especially within the Panguitch, Carbon, and Emery Population Areas, indicating that development of coal resources could affect already isolated GRSG populations in Utah. Approximately 36 percent of BLM-administered PHMA in MZ III and 1 percent of PHMA on National Forest System lands is influenced by coal mining (Manier et al. 2013, p. 74).

Impact Analysis. Coal potential is high in the Utah portion of MZ III; development of these resources could affect already small and/or isolated populations in Utah or portions of those populations. A majority of the acres within the Emery and Carbon Population Areas have high or moderate development potential for coal. All mining in these population areas is accomplished using underground mining methods. Portions of Panguitch and Parker Population Areas also have high or moderate coal potential. The Alton Coal Tract project anticipates removing 2 million tons per year for 20 to 25 years using surface mining techniques in GRSG habitat in Panguitch. Although mitigation measures would be applied to protect GRSG, the USFWS review found that there was a risk of displacement or extirpation of the Alton-Sink Valley population (USFWS 2012).

Alternative B and C would identify PHMA as unsuitable within MZ III, while Alternatives D and E and the Proposed Plans would not identify acreage as unsuitable. However, the Proposed Plans would assess coal lease applications for suitability on a case-by-case basis, with PHMA considered essential habitat for GRSG. As a result, surface mining and surface mining operations, and its associated impacts, within PHMA would be less likely under the Proposed Plans.

The RFD scenario (**Appendix R**) suggests that the development of coal resources in the sub-region would not vary considerably across alternatives. Furthermore, areas considered suitable for leasing will not necessarily be leased; the actual amount of leasing depends on factors such as price and regulatory safeguards. Because Utah has areas with high coal potential, decisions in this sub-region will have a substantial impact on the MZ.

Under all alternatives and the Proposed Plans, new coal lease applications on federal mineral estate would be subject to suitability determinations governed by 43 CFR, Part 3461.5. Under unsuitability criterion 15, the BLM may determine that portions of the MZ contain essential GRSG habitat and are unsuitable for all or certain stipulated methods of coal mining. If the BLM made this determination, it would apply stipulations to restrict coal mining and protect GRSG, including possibly prohibiting surface coal mining. As such, the regulations under Criterion 15 of 43 CFR, Part 3461.5(o)(1) would reduce the potential for long-term impacts associated with new coal leasing projects on GRSG habitats and populations.

New coal leasing and development may also occur on non-federal lands in MZ III, subject to state regulations (including reclamation requirements). Additionally, new coal leasing in Utah would be subject to the 5 percent disturbance limit as required by the Utah Executive Order. These measures would help protect GRSG habitat on lands where 43 CFR, Part 3461.5(o)(1) do not apply.

Reasonably foreseeable coal development in MZ III is expected to continue (**Section 5.4.8**), though the requirements of 43 CFR, Part 3461.5, Criterion 15, in combination with BLM planning efforts and state plans, would reduce the threat from coal extraction by restricting the location of developments and requiring mitigation. When restrictions in the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Mineral Materials

Nature and Type of Effects. Development of surface mines for sand, gravel, and other common mineral materials found in MZ III may negatively impact GRSG numbers and disrupt the habitat and life cycle of the species, similar to other types of mining activities (Braun 1998; Manier et al. 2013, pp. 70-71).

Conditions in the Sub-region and in MZ III. There are 1,140,200 acres of mining and mineral materials disposal sites (not including minerals mined as energy sources) on BLM-administered lands in priority habitat and general habitat in MZ III; sites on BLM-administered lands contribute 77 percent of potential influence on priority habitat and 79 percent of potential influence on general habitat (Manier et al. 2013, p. 77). National Forest System lands contribute 8 and 9 percent of potential influence on priority habitat and general habitat, respectively, while private lands contribute 13 and 11 percent of influence on priority habitat, and general habitat, respectively. Indirect effects are estimated to 1.5 miles out from the direct effects area (Manier et al. 2013, p. 77).

The mineral materials currently being developed for commercial purposes in the sub-region include construction sand and gravel, crushed stone, dimension stone, and common clays. Mineral materials are fairly dispersed throughout sub-regional lands in MZ III; PHMA and GHMA

are most affected by mining and mineral materials disposal sites on BLM-administered lands. GRSG may be directly impacted, being in the path of development; however, indirect impacts on habitat affect a much wider population of birds. In total, 40 percent of priority habitat and 40 percent of general habitat influenced by the indirect impact of mining and mineral materials disposal sites are on BLM-administered land (Manier et al. 2013, p. 77), suggesting that management of mining and material disposal sites on BLM-administered lands would have the greatest impact on GRSG habitat conditions relative to conservation actions on private and/or state lands. For example, closure of BLM-administered lands to mineral material disposal could shift mineral material disposal in the MZ onto adjacent lands.

Impact Analysis. **Table 5.11**, Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ III, provides a quantitative summary of acreages of BLM-administered and National Forest System lands open and closed to mineral material disposal across MZ III.

Table 5.11
Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ III

	Priority Habitat Management Areas		**General Habitat Management Areas**	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Open to Mineral Material Disposal				
Alternative A	2,314,000	100%	4,134,000	0%
Alternative B	0	0%	4,316,000	4%
Alternative C	0	0%	4,134,000	0%
Alternative D	0	0%	4,397,000	6%
Alternative E	1,984,000	100%	4,471,000	8%
Proposed Plans	1,000	100%	4,415,000	6%
Closed to Mineral Material Disposal				
Alternative A	3,854,000	1%	256,000	0%
Alternative B	5,968,000	36%	266,000	4%
Alternative C	6,160,000	38%	256,000	0%
Alternative D	5,875,000	35%	278,000	8%
Alternative E	3,828,000	1%	282,000	9%
Proposed Plans	5,857,000	35%	280,000	8%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to mineral material disposal in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Under Alternative A, most public lands within the sub-region are open to mineral material disposal. Specific closures of areas to mineral materials such as ACECs or crucial or essential wildlife habitat exist throughout the sub-region; however, this alternative provides the least protection to GRSG or GRSG habitat. Under Alternatives B, C, and D, and the Proposed Plans, PHMA would generally be managed as closed to mineral material disposal. Acres of GHMA open to disposal would be approximately the same under all alternatives. Under Alternative E, GRSG habitat would not be closed to mineral materials disposal, but would be open with stipulations. Acres closed in GHMA would be similar across most alternatives, though Alternative E would have the greatest amount of acres of GHMA closed.

The Proposed Plans would close PHMA to new mineral materials sales, though PHMA would remain open to expansion of existing pits. GHMA would remain open under the Proposed Plans, subject to RDFs and lek buffers. The Proposed Plans would provide additional protections to GRSG from mineral material development in PHMA, by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap, RDFs, buffers, and mitigation. These closures and restrictions would reduce the effect on GRSG from mineral material development on BLM-administered and National Forest System lands in MZ III for most action alternatives. However, these actions may shift development onto nonfederal lands, with potentially greater impact on GRSG, depending on the site, if similar protective stipulations and permit requirements did not apply on those other lands.

New mineral material disposal authorizations that require state agency review or approval would be subject stipulations for development in under both the Nevada and Utah state conservation plans for GRSG. These stipulations would benefit GRSG in Core, Priority, and General Habitats (Nevada) and SGMAs (Utah) by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from mineral material disposal. These stipulations would be of particular benefit on privately owned surface and subsurface lands, where BLM and Forest Service protective regulatory mechanisms do not apply.

Reasonably foreseeable mineral materials development in MZ III is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Locatable Minerals

Nature and Type of Effects. Locatable minerals include gold, silver, uranium, and bentonite. Activities associated with locatable mineral development, such as stockpiling topsoil and extracting and transporting material, would cause mortality and nest disruption. These actions also would reduce the functionality of the surrounding habitat with noise and light disturbance, resulting in lost and degraded GRSG habitat.

As with fluid mineral development, reclamation practices may help to reduce long-term impacts on GRSG and their habitat. Although disturbed areas have not been restored to near pre-disturbance conditions in the past, recent efforts have been directed toward restoring functional habitat. Future reclamation should be focused on restoring habitats capable of supporting persistent GRSG populations. Even with effective restoration, restored areas may not support GRSG populations at the same level as prior to disturbance.

Conditions in the Sub-region and in MZ III. The primary locatable minerals in MZ III are gold, silver, and copper. While there are locatable mining claims in GRSG habitat, actual locatable mining in GRSG habitat is minimal.

Impact Analysis. **Table 5.12**, Acres Open and Recommended for Withdrawal from Locatable Mineral Entry in GRSG Habitat in MZ III, provides a quantitative summary of acreages of BLM-

administered and National Forest System lands open and recommended for withdrawal from mineral entry across MZ III.

Table 5.12
Acres Open and Recommended for Withdrawal from Locatable Mineral Entry in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Open to Locatable Mineral Entry				
Alternative A	5,998,000	37%	4,215,000	0%
Alternative B	3,759,000	0%	4,373,000	4%
Alternative C	3,759,000	0%	4,215,000	0%
Alternative D	5,749,000	35%	4,464,000	6%
Alternative E	5,743,000	35%	4,479,000	6%
Proposed Plans	5,766,000	35%	4,445,000	5%
Recommended for Withdrawal from Locatable Mineral Entry				
Alternative A	10,000	100%	0	0%
Alternative B	2,081,000	100%	4,000	100%
Alternative C	2,242,000	100%	0	0%
Alternative D	8,000	100%	2,000	100%
Alternative E	8,000	100%	2,000	100%
Proposed Plans	4,000	100%	0	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open to mineral entry and recommended for withdrawal from locatable mineral entry in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Under Alternative A, all lands are generally open to mineral location, and while there are specific locatable mineral withdrawals for particular ROWs, designated wilderness areas, ACECs and other administrative needs, there are no locatable mineral withdrawals specific to protecting GRSG habitat. Impacts on GRSG and its habitat would be greatest under Alternative A. Mitigation of effects on GRSG and its habitat are identified through the NEPA process approving plans of operation.

Under Alternatives B and C, PHMA would be recommended for withdrawal. These alternatives would increase restrictions and limitations for locatable minerals management in GRSG habitat and would thus provide conservation gains to GRSG relative to Alternative A, particularly Alternative C. Under Alternatives D and E, lands would generally remain open to locatable minerals as under Alternative A; however, protective stipulations would apply.

Subject to valid existing rights and applicable law, the Proposed Plans would provide additional protections to GRSG from mineral material development by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap and 1 facility per 640 acre density cap, RDFs, buffers, and mitigation. These measures would be applied to the maximum extent allowable by law. Under the Proposed Plans, abandoned mine sites in GRSG habitat would be restored by eliminating physical structures that could provide nesting and/or perching sites for predators. These closures and restrictions would reduce the effect on GRSG from mineral material

development on BLM-administered and National Forest System lands in MZ III for most action alternatives.

New locatable mineral authorizations that require state agency review or approval would be subject to stipulations for development in under the Utah state conservation plan for GRSG. These stipulations would benefit the GRSG in SGMAs by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from locatable mineral management. These stipulations would be of particular benefit on privately owned surface and subsurface lands, where BLM and Forest Service protective regulatory mechanisms do not apply.

Reasonably foreseeable locatable mineral development in MZ III is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat by applying RDFs. The disturbance caps in the Proposed Plans would not block locatable mineral entry projects, but any locatable mineral entry would be considered as disturbance under the cap. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Nonenergy Leasable Minerals

Nonenergy leasable minerals are materials such as sulfates, silicates, and trona (sodium carbonate). Impacts on GRSG are similar to those from other types of mining.

Conditions in the Sub-region and in MZ III. Existing leases for nonenergy leasable minerals represent a relatively small threat spatially, as 57,400 acres (less than 1 percent) of GRSG habitats in MZ III are directly affected by existing prospecting permits (Manier et al. 2013, p. 71). Nonenergy leasable deposits in Utah are primarily within MZ II and include deposits of gilsonite and phosphate. Identified solid leasable minerals in the Nevada Sub-region include potassium and sodium.

Impact Analysis. **Table 5.13**, Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ III, provides a quantitative summary of acreages of BLM-administered and National Forest System lands open and closed to nonenergy leasable mineral leasing across MZ III.

Alternatives B and C and the Proposed Plans would increase the acreage of PHMA closed to nonenergy leasing compared to current management (Alternative A) and Alternatives D and E. The alternatives would provide fewer protections in GHMA, with the exception of Alternative E, which would increase the acreage of GHMA closed to leasing. The Proposed Plans would provide additional protections compared to the other action alternatives by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap and 1 facility per 640 acre density cap, buffers, RDFs, and mitigation.

Table 5.13
Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ III

	PHMA		GHMA	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
Open to Nonenergy Leasing				
Alternative A	2,291,000	100%	4,134,000	0%
Alternative B	0	0%	4,326,000	4%
Alternative C	0	0%	4,134,000	0%
Alternative D	1,867,000	100%	4,413,000	6%
Alternative E	1,965,000	100%	4,468,000	7%
Proposed Plans	0	0%	4,421,000	6%
Closed to Nonenergy Leasing				
Alternative A	4,200,000	2%	13,000	0%
Alternative B	6,290,000	34%	13,000	0%
Alternative C	6,483,000	36%	13,000	0%
Alternative D	4,330,000	5%	19,000	32%
Alternative E	4,172,000	1%	40,000	70%
Proposed Plans	6,187,000	33%	30,000	58%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to nonenergy leasing in MZ III; it also displays the percentage of those acres that are found within the sub-region.

Reasonably foreseeable nonenergy leasable mineral development in MZ III is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ III would reduce the threat by providing additional protections such as disturbance caps, RDFs, and mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

Recreation

Nature and Type of Effects. Recreation, such as camping, bicycling, wildlife viewing, horseback riding, fishing, and hunting, can be dispersed; concentrated (such as OHV use and developed campsites); or permitted (such as through a BLM SRP or Forest Service SUP). The BLM also manages SRMAs where recreation is a primary resource management consideration.

Recreation on federally administered lands that use the extensive network of double-track and single-track routes have an impact on sagebrush and GRSG. Ecological impacts of roads and motorized trails are mortality due to collisions; behavior modifications due to noise, activity, and habitat loss; alteration of physical environment; nutrient leaching; erosion; invasive plants spread; increased use; and alteration by humans due to accessibility (Knick et al. 2011, p. 219). Recreation activities can degrade GRSG habitat through direct impacts on vegetation and soils, introduction or spread of invasive species, and habitat fragmentation. This occurs in areas of concentrated use, trailheads, staging areas, and routes and trails.

Motorized activities, including OHV use, are expected to have a larger footprint on the landscape. They are anticipated to have the greatest level of impact due to noise levels, compared to non-motorized uses, such as hiking, cycling or equestrian use. Cross-country motorized travel, which is permitted in designated areas on BLM-administered lands but not on National Forest System lands, would increase the potential for soil compaction, perennial grasses and forbs loss, and reduce sagebrush canopy cover. Losses in sagebrush canopy could be the result of repeated, high frequency, cross-country OHV use over long periods. In addition, the chances of wildfire are increased during the summer, when fire dangers are high and recreation is at its highest.

Dispersed uses expand the human footprint. Closing areas to recreation and reclaiming unused, minimally used, or redundant roads in and around sagebrush habitats during seasonal use by GRSG may reduce the footprint and presumably impacts on wildlife. Restricting access to important habitat areas during seasonal use (lekking, nesting, brood-rearing, and wintering) may decrease the impacts associated with humans. While restricting access and recreation opportunities will not eliminate other impacts, such as invasive plant spread, predator movements, cover loss, and erosion (Manier et al. 2013, p. 108), it will enhance habitat effectiveness as predators will not be drawn to the areas and recreationists will not transfer invasive plant spread.

Conditions in the Sub-region and in MZ III. Human populations have increased and expanded, primarily over the past century and in the western portion of the sagebrush distribution (Knick et al. 2011, p. 212). With these expanding populations come greater human impacts (Leu et al. 2008).

Impact Analysis. **Table 5.14**, Acres of Travel Management Designations in GRSG Habitat in MZ III, shows acres of travel management designations in GRSG habitat in MZ III.

The COT report objectives for recreation are to maintain healthy native sagebrush communities, based on local ecological conditions, and to manage direct and indirect human disturbance (including noise) to avoid interruption of normal GRSG behavior (USFWS 2013a, p. 49). Limits on road use under the action alternatives and limits on OHVs would help meet these objectives.

As shown in **Table 5.14**, there are slight variations among the action alternatives in acres closed and limited to motorized vehicles in both PHMA and GHMA, however, Alternative C would close the most acres of PHMA, and the Proposed Plans would designate the most acres of PHMA as limited. All action alternatives would close PHMA to cross-country motorized travel, and Alternatives C and D and the Proposed Plans would similarly restrict acres of open GHMA. Alternative E applies to National Forest System lands, which are all limited to existing routes under current management. Because of travel management planning, impacts on GRSG from recreational motorized vehicle use would be greatest under Alternative A; impacts would be reduced most under Alternatives C and D and the Proposed Plans.

Table 5.14
Acres of Travel Management Designations in GRSG Habitat in MZ III

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ III	***Percent within Sub-region***	**MZ III**	***Percent within Sub-region***
		Open		
Alternative A	457,000	100%	0	0%
Alternative B	0	0%	33,000	100%
Alternative C	0	0%	0	0%
Alternative D	0	0%	0	0%
Alternative E	206,000	100%	65,000	100%
Proposed Plans	0	0%	0	0%
		Limited		
Alternative A	4,640,000	19%	4,218,000	0%
Alternative B	4,992,000	25%	4,301,000	2%
Alternative C	4,917,000	23%	4,218,000	0%
Alternative D	4,921,000	23%	4,218,000	0%
Alternative E	4,703,000	20%	4,354,000	3%
Proposed Plans	5,527,000	32%	4,445,000	5%
		Closed		
Alternative A	57,000	37%	172,000	0%
Alternative B	55,000	36%	173,000	1%
Alternative C	248,000	85%	172,000	0%
Alternative D	55,000	36%	173,000	1%
Alternative E	37,000	3%	193,000	11%
Proposed Plans	42,000	17%	187,000	8%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within travel management designations of open, limited and closed in MZ III; it also displays the percentage of those acres that are found within the sub-region.

The Gooseberry Narrows Reservoir project is planned partly on National Forest System lands in Sanpete County. The proposed reservoir will flood the southern end of the valley, including sagebrush that is considered occupied GRSG habitat, though surveys are lacking to determine whether or not it is important to the GRSG in the area. In addition to the impact of the reservoir and the direct loss of GRSG habitat recreational facilities surrounding the reservoir for fishing, OHV riding, camping, picnicking, horseback riding, and hunting are expected to be requested. Under the Proposed Plans, the Forest Service limits on development of recreation facilities within PHMA could affect the location and/or nature of recreation facilities near the lake. The reservoir itself would not count against the disturbance cap, but the recreation facilities would. Development of such facilities could increase human disturbance in addition to habitat loss in the Carbon Population Area.

Reasonably foreseeable recreation in MZ III is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as the Nevada and Northeastern California Sub-region BLM and Forest Service Proposed Plan in MZ III would reduce the threat by providing additional protections such as disturbance caps and limitations on National Forest System lands. When restrictions within the Utah LUPA are added

to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ III.

5.4.5 WAFWA Management Zone IV

Existing Conditions in MZ IV and the Utah Sub-region

This section summarizes existing conditions and past and present actions in the Utah Sub-region planning area (provided in more detail in **Chapter 3**) and MZ IV as a whole. Reasonably foreseeable future actions are discussed in **Section 5.4.8**.

GRSG Habitat and Populations

MZ IV consists of nine GRSG populations in Oregon, Idaho, Nevada, Utah, and Montana: east-central Idaho, southwest Montana, Snake-Salmon-Beaverhead, Belt Mountains, Weiser, northern Great Basin, Box Elder, and Sawtooth (Garton et al. 2011). Box Elder is the only population area within Utah. The three most substantial threats to GRSG habitats and populations occurring across populations in WAFWA MZ IV are invasive weed spread, livestock grazing, and isolation/small size (USFWS 2013a). This zone represents one of the largest areas of connected GRSG habitat, as demonstrated by Knick et al. (2011), and supports the largest population of GRSG outside of the Wyoming Basin (Garton et al. 2011).

The Snake River Plain as a whole represents one of the larger areas of habitat connectivity and supports the largest GRSG population outside of the Wyoming Basin in the northern Great Basin (Garton et al. 2011). However, some populations within WAFWA MZ IV, such as Baker, East-central Idaho, Sawtooth, and Weiser and Belt Mountains, are small and isolated with little connectivity to other populations. These areas have been isolated by extirpation of neighboring populations or conversion of sagebrush habitat to agricultural fields or human developments.

The Box Elder Population Area in Utah is sizeable with potential for growth (USFWS 2013a). This population is large with 10-year male lek counts that range from 329 and 1,163 males (estimated population ranging from 1,316 and 4,652 birds; UDWR 2013).The population is considered stable, though threatened by fragmentation, invasive species, wildfire, and juniper encroachment (USFWS 2013a). The area has a long history of agricultural land uses, and the majority of highly productive lands have been converted to agricultural use, resulting in a sagebrush landscape that is drier and less productive than those of past eras (Manier et al. 2013, pp. 249-250). Juniper encroachment, invasive species, and their interaction with fire is the primary threat for this population. For more detailed information on the Box Elder Population Area refer to **Section 3.3**).

In MZ IV, BLM-administered, National Forest System, and other federal lands account for approximately 22,522,300 million acres of GRSG habitat (approximately 68 percent of habitat), with state and private lands accounting for over 10 million acres of GRSG habitat (approximately 31 percent of habitat) (Manier et al. 2013, p. 118). The BLM also has some management authority over split estate lands, with privately held surface and federal subsurface mineral rights. The majority of the sagebrush in this MZ is federally managed (Knick 2011), but local projects may be more important than range-wide effects because of habitat quality and connectivity at the local scale as the majority of the Box Elder Population Area is privately owned.

Table 5.15, Management Jurisdiction in MZ IV by Acres of Priority and General Habitats, provides a breakdown of landownership and acres of GRSG habitat in MZ IV. As the table shows, approximately 52 percent of priority habitat and 19 percent of general habitat is on BLM-administered lands. Approximately 7 percent of priority habitat and 5 percent of general habitat is on National Forest System lands. In the Utah Sub-region, there are approximately 1,138,000 million acres of GRSG habitat, including approximately 439,500 acres on BLM-administered lands and 0 acres on National Forest System lands. The remaining acres of GRSG habitat comprise private, local state, and other federal and tribal lands.

Table 5.15
Management Jurisdiction in MZ IV by Acres of Priority and General Habitats

	Total Surface Area (Acres)	Priority (Acres)	General (Acres)	Non-habitat (Acres)
MZ IV	78,259,200 (100%)	21,930,600 (28%)	10,958,500 (14%)	45,370,100 (58%)
BLM	26,220,300 (34%)	13,710,700 (52%)	4,928,200 (19%)	7,581,400 (29%)
Forest Service	22,291,600 (28%)	1,613,800 (7%)	1,113,500 (5%)	9,564,300 (43%)
Tribal and Other Federal	2,431,000 (3%)	633,600 (26%)	522,500 (21%)	1,274,900 (52%)
Private	23,150,400 (30%)	4,890,200 (21%)	3,516,700 (15%)	14,743,500 (64%)
State	3,681,000 (5%)	1,019,400 (28%)	846,200 (23%)	1,815,400 (49%)
Other	484,800 (<1%)	62,900 (13%)	31,400 (6%)	390,500 (81%)

Source: Manier et al. 2013, p. 118

Population Trends in Management Zone IV

Historic conversion of habitat to agriculture, as well as fire, urbanization, and spread of weeds has resulted in a residual sagebrush landscape that is less productive and more fragmented than those prior to European colonization. As a result, more known populations in the region are relatively small and/or separated from adjacent populations. Notable exceptions are the Snake-Salmon-Beaverhead and Northern Great Basin populations (Manier et al. 2013, p. 132). Garton et al. (2011) predicted a 10.5 percent chance this MZ will fall below 200 males by 2037, and a 39.7 percent chance it would fall below 200 males by 2107 (USFWS 2013a, p. 75).

While population estimates and trends for the sub-region are not available, GRSG populations are described in **Section 3.3**. The Snake-Salmon-Beaverhead and Northern Great Basin populations encompass the largest number of occupied leks in the sub-region. The Northern Great Basin population is especially important to long-term conservation of GRSG in MZ IV. This is because it comprises a substantial portion of the Great Basin core population (Connelly et al. 2004); shared with Nevada, Utah, Idaho, and Oregon, this is one of the two remaining major population strongholds in the range of the species. The Snake-Salmon-Beaverhead population provides additional and substantial population contributions within Idaho and provides known connectivity with the Southwest Montana population area.

Relevant Cumulative Actions

This cumulative effects analysis considers the incremental impact of the Utah Proposed LUPA and alternatives in combination with other past, present, and reasonably foreseeable future federal and non-federal actions on all lands in MZ IV. Where these actions occur within GRSG

habitat, they would cumulatively add to the impacts of BLM- and Forest Service-authorized activities set forth in the Utah Proposed LUPA. In addition to the conservation efforts described above, relevant reasonably foreseeable future cumulative actions occurring on federal, private, or mixed landownership in MZ IV are described in the Proposed RMPAs/LUPAs for Utah, Nevada and northeastern California, Idaho and southwestern Montana, and Oregon, which are hereby incorporated by reference.

The following list includes large-scale past, present, and future actions in MZ IV that, when added to the Proposed Plans and alternatives for the Utah sub-region, could cumulatively affect threats to GRSG (more detail is included in the table in **Section 5.4.8**):

- Gateway West 230/500 Transmission Line Project, Wyoming and Idaho
- Boardman to Hemingway Transmission Line Project, Oregon and Idaho
- Fuels and vegetation treatments throughout the MZ
- Grazing permit renewals and allotment management plan updates throughout the MZ
- China Mountain Wind Project, Nevada and Idaho
- Small mining projects throughout the MZ
- Military operating area overflights in the Utah Test and Training Range

The Utah Test and Training Range is a military test and training range in the west desert region of Utah that has the footprint of 2,675 square miles (6,930 square kilometers) of ground space and over 19,000 square miles (49,000 square kilometers) of air space. It is divided north and south by I-80 and is administered and maintained by the US Air Force's HQ Utah Test and Training Range, which was formerly known as the 388th Range Squadron out of Hill Air Force Base near Ogden, Utah. The site is frequently used by the US Air Force, US Marine Corps, and US Army for the disposal of explosive ordnance, testing of experimental military equipment, as well as ground and air military training exercises. Types of training that occur in the Utah Test and Training Range include air-to-air-combat, air-to-ground inert and live practice bombing, and gunnery training by Department of Defense aircrews. The Utah Test and Training Range has been used by the military for testing and training for the military since Congress appropriated the funds in 1940. The Utah Test and Training Range also extends into MZ III.

There is some research suggesting that the presence of noise substantially above ambient levels can decrease lek attendance (Blickley et al. 2012). Based on this, it could be extrapolated that there may be some impact on GRSG from the noise from military operations. However, this research refers to chronic noise impacts. Since the activities that are authorized by the Utah Test and Training Range are short bursts of activity and only noise for a few minutes or in some cases a few seconds (a jet flying over or a disposal of an ordinance) and the fact that the testing and training have been ongoing for such an extended time and the populations in the area have persisted, it is reasonable to assume that they very sparse and temporary therefore are negligible. The proposed addition of the actions associated with the Proposed Plans, which would include measures to minimize noise from BLM- and Forest Service-permitted actions, would not increase the effects of noise above those already present.

Threats to GRSG in Management Zone IV

The COT report identifies the present and widespread threats facing GRSG in MZ IV as fire, spread of weeds, conifer encroachment, infrastructure, grazing/free-roaming equids, conversion to agriculture, energy development, and recreation (USFWS 2013a, pp. 22-24). These threats impact GRSG mainly by fragmenting and degrading their habitat. The loss of sagebrush steppe across the west approaches or exceeds 50 percent in some areas. It is a primary factor in long-term declines in GRSG abundance across their historical range (USFWS 2010).

Habitat fragmentation reduces connectivity of populations and increases the likelihood of extirpation from random events, such as drought or outbreak of West Nile virus. Furthermore, climate change is predicted to affect the distribution of species through changes in annual average precipitation, greater early season plant growth, and increased frequency and severity of wildfires (BLM 2013a). Sensitive species such as GRSG, which are already stressed by declining habitat, increased development, and other factors, could experience additional pressures because of climate change.

Each COT report threat considered present and widespread in at least one population in MZ IV is discussed below. The quantitative impact analysis focuses on impacts in the MZ.

Wildfire

Nature and Type of Effects. Sagebrush killed by wildfire often requires many years to recover, especially after large fires. Contiguous old-growth sagebrush sites are at high fire risk, as are large blocks of contiguous dead sagebrush and sagebrush sites with a substantial cheatgrass understory. Before recovering, these sites provide limited if any use to GRSG, except along the edges and in unburned islands. Because of its widespread impact on habitat, fire has been identified as a primary factor associated with GRSG population declines. Depending on the species of sagebrush and the size of a burn, a return to a full pre-burn community cover can take from 25 to 120 years (Baker 2011). In addition, fires can reduce invertebrate food sources and may facilitate the spread of invasive weeds.

Conditions in the Sub-region and in MZ IV. Wildfire has been a primary threat to GRSG habitats and populations occurring across MZ IV, with 81 percent of priority habitat and general habitat having high risk for fire, including the Snake-Salmon-Beaverhead and Northern Great Basin population areas (Manier et al. 2013, p. 133). Since 2000, more than 4.9 million acres (14 percent of priority habitat and 17 percent of general habitat) of GRSG habitats have burned in this MZ, with an average of more than 239,000 acres of priority habitats burned annually; more than 1 million acres burned in some years (Manier et al. 2013, p. 133). The Murphy Fire in Idaho and Nevada affected over 650,000 acres of habitat in this MZ in 2007 (USFWS 2013a, p. 78). In 2012, the Miller Homestead and Long Draw fires in southeastern Oregon burned 160,800 and 558,200 acres, respectively, mostly on BLM-administered lands with significant losses of GRSG habitat (BLM 2013c). An additional factor in the analysis of cumulative effects of fire on GRSG is the trend of increasing fire size and frequency and severity, due to factors including exotic annual grasses, and climate change.

Impact Analysis. Management actions in the Utah GRSG LUPA/EIS that emphasize wildfire suppression in GRSG habitat would benefit the species by limiting habitat loss in the event of wildfire. Under current management (Alternative A), prescribed burning may be used to achieve

habitat objectives; most existing LUPs support objectives of re-introducing fire into fire-dependent ecosystems and prioritizing response to wildfires and determining where fire can be used for resource benefit. Alternatives B, C and E would set limits on the use of prescribed fire, while Alternative D and the Proposed Plans would allow its use if other treatment methods were not effective. The action alternatives all prioritize sagebrush protection in fuels treatment programs and would provide superior protection for sagebrush in prescribed burning, fuels treatment and fire suppression. The interagency Greater Sage-Grouse Wildfire, Invasive Annual Grasses and Conifer Expansion Assessment (FIAT 2014) under the Proposed Plans prioritizes landscapes for wildfire prevention and suppression, fuels management, and habitat restoration and rehabilitation within key GRSG habitats based on resistance and resilience concepts in Chambers et al. (2014). This management is in accordance with the COT report objective to retain and restore healthy native sagebrush plant communities within the range of GRSG.

The Interagency Standards for Fire and Fire Aviation Operations "Red Book" includes a BMP for GRSG habitat conservation for wildlife and fuels management (BLM 2013b). This document is a supplemental policy or guidance for the BLM, the Forest Service, and the USFWS. This BMP would benefit the GRSG during interagency wildland fire operations. It would do this by using spatial habitat data and predictive services to prioritize and preposition firefighting resources in critical habitat areas. Coordination with rural fire districts to manage wildfires in GRSG habitat will further reduce this threat across land ownership types and improve the quality and quantity of habitat.

Reasonably foreseeable wildland fire management efforts are projected to increase (**Section 5.4.8**), especially through increased coordination of federal, state, and local fire prevention actions and the implementation of other BLM and Forest Service LUPAs in MZ IV. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Spread of Weeds

Nature and Type of Effects. Invasive weeds alter plant community structure and composition, productivity, nutrient cycling, and hydrology. Invasive weeds also may cause declines in native plant populations, including sagebrush habitat, through such factors as competitive exclusion and niche displacement. Invasive plants reduce and may eliminate vegetation that GRSG use for food and cover. Invasive weeds fragment existing GRSG habitat and reduce habitat quality by competitively excluding vegetation essential to GRSG. Invasive weeds can also create long-term changes in ecosystem processes, such as fire cycles and other disturbance regimes that persist even after an invasive plant is removed (Connelly et al. 2004).

Roads and recreation can promote the spread of invasive weeds through vehicular traffic. Weed infestations can further exacerbate the fragmentation effects of roadways. Irrigation water has also supported the conversion of native plant communities to hayfields, pasture, and cropland, thus fragmenting sagebrush habitats. Excessive grazing in these habitats can lead to the demise of the most common perennial grasses in this system and an abundance of invasive species, such as cheatgrass or Japanese brome (Reisner et al. 2013).

Conditions in the Sub-region and in MZ IV. By way of seeds carried by wind, humans, machinery, and animals, invasive and noxious weeds have invaded and will continue to invade many

locations in MZ IV, including the sub-region. Some species, including annual bromes and Canada thistle, have become so ubiquitous throughout the sub-region that it is considered economically unfeasible to attempt to control certain areas, such as those that have crossed a threshold that precludes their returning to traditional plant community composition through normal plant succession. Such species are considered part of the vegetative landscape despite their adverse impacts on other vegetation. Canada thistle, although common throughout the sub-region, is not treated on a plant-by-plant basis; rather, it is treated when plant populations reach densities high enough to make it the majority species. Examples are when it is growing in the bottom of dry reservoirs, on recreation sites, and along established roads and undeveloped vehicle trails.

The BLM and Forest Service currently manage weed infestations through integrated weed management: biological, chemical, mechanical, manual, and educational methods. The BLM is guided by the 1991 and 2007 RODs for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991) and by the 2007 Programmatic Environmental Report (BLM 2007). Weeds are managed in cooperation with county governments and represents a landscape-level approach across management jurisdictions. Similarly, the Humboldt-Toiyabe NF manages a comprehensive weed management program as described in their Noxious Weed Control Program for Humboldt-Toiyabe National Forest (Forest Service 2001).

Impact Analysis. Increased activity, such as surface disturbance, motorized transportation, and animal and human activity, would increase the chance for the establishment and spread of invasive plants.

Under current management (Alternative A), the BLM and Forest Service utilize integrated weed management techniques, including mechanical, manual, chemical, and biological control to reduce the likelihood of invasive weed spread and the extent of current infestations. This issue is intimately tied to the threat from fire, and fuels management actions can also reduce weeds and create fire breaks.

Under all alternatives, integrated vegetation management would be used to control, suppress, and eradicate noxious and invasive species. Under Alternatives B, C, and D, and the Proposed Plans vegetation management and restoration would prioritize sagebrush re-establishment and weed control as part of habitat management. Overall, methods, approaches, and resources for weed control would be similar under all alternatives. The Proposed Plans would likely have the lowest potential for invasive weed spread and establishment, given the three percent anthropogenic disturbance threshold which would limit surface disturbance, extensive mitigation and monitoring plans, wildfire and invasive species assessments and subsequent prioritization, and requirement for no net loss of GRSG habitat. The COT report objective for invasive species is to maintain and restore healthy native sagebrush plant communities.

Invasive species on BLM-administered and National Forest System lands would be controlled under all alternatives. This would provide a net conservation gain to GRSG by restoring degraded sagebrush habitat.

Relevant cumulative actions that result in surface-disturbing activities would increase the potential for the spread of invasive weeds on both federal and non-federal lands. Projects subject to the general stipulations outlined in the Utah and Montana executive orders are

required to control noxious and invasive weed species and to use native seed mixes during reclamation processes. These stipulations would benefit GRSG core habitat areas. They would accomplish this by limiting the spread or establishment of invasive species, particularly on lands that lack BLM and Forest Service protective regulatory mechanisms. In Idaho, the GRSG conservation strategy has identified GRSG conservation measures related to invasive weeds, such as reducing the risk and rate of fire spread, restoration and rehabilitation, and weed control.

Reasonably foreseeable weed management efforts are projected to increase (**Section 5.4.8**), including other state and county noxious weed regulations and the implementation of other BLM and Forest Service LUPAs in MZ IV. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV. The Proposed Plans may result in the greatest net conservation gain due to its three percent anthropogenic disturbance cap that should reduce potential for the spread of weeds during the 20-year analysis period.

Conifer Encroachment

Nature and Type of Effects. Conifer woodlands, especially juniper (*Juniperus* spp.) and in some regions pinyon pine (*Pinus edulis*), may expand into sagebrush habitat and reduce availability of habitat for GRSG. Conifer expansion may be encouraged by human activities, including fire suppression and grazing (Miller et al. 2011). If woodland development is sufficient to restrict shrub and herbaceous understory growth, habitat quality for GRSG will be reduced (Connelly et al. 2004). Mature trees offer perch sites for raptors; thus, woodland expansion may also increase the threat of predation (Manier et al. 2013, p. 91). Locations within approximately 1,000 yards of current pinyon-juniper woodlands are at highest risk of expansion (Bradley 2010). Studies have shown that GRSG incur population-level impacts at very low levels of conifer encroachment (Baruch-Mordo et al. 2013). In MZ IV, conifer encroachment is connected to reduced habitat quality in important seasonal ranges when woodland development is sufficient to restrict shrub and herbaceous production (Connelly and others, 2004 in Manier et al. 2013, p. 91).

Conditions in the Sub-region and in MZ IV. Approximately 55 percent of conifer encroachment risk in priority habitat (and 34 percent in general habitat) occur on BLM-administered lands within MZ IV (Manier et al. 2013, p. 93). In comparison, 25 percent of conifer encroachment risk in priority habitat (and 32 percent in general habitat) occur on private lands and 15 percent in priority habitat occurs on National Forest System lands (25 percent in general habitat). Therefore, BLM actions are likely to have a greater potential to ameliorate the effects of conifer encroachment on GRSG, particularly in priority habitat, than any other single land management entity.

Impact Analysis. The COT objective is to remove pinyon-juniper from areas of sagebrush that are most likely to support GRSG (post-removal) at a rate that is at least equal to the rate of pinyon-juniper incursion (USFWS 2013a, p. 47). Management under Alternatives B, C, and D, and the Proposed Plans would prioritize restoration in GRSG seasonal habitat, by targeting conifers in these areas for removal.

Relevant cumulative actions on federal, private, and state lands within the MZ include several large conifer removal projects (**Section 5.4.8**). Further, the NRCS includes conservation

measures to remove encroaching conifers near leks and lek seasonal habitats while minimizing disturbance to GRSG (NRCS 2015).

Reasonably foreseeable conifer encroachment management efforts are projected to increase (**Section 5.4.8**), including efforts on private land and implementation of other BLM and Forest Service LUPAs in MZ IV. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV. The Proposed Plans would have the greatest reduction in the threat from conifer encroachment and provide a net conservation gain to GRSG.

Infrastructure

Rights-of-Way

Nature and Type of Effects. As discussed in **Section 4.3**, power lines can directly affect GRSG by posing a collision and electrocution hazard. They also can indirectly decrease lek attendance and recruitment by providing perches and nesting habitat for potential avian predators, such as golden eagles and ravens (Connelly et al. 2004). In addition, power lines and pipelines often extend for many miles. The ground disturbance associated with construction, as well as vehicle and human presence on maintenance roads, may introduce or spread invasive weeds over large areas, degrading habitat. Impacts from roads may include direct habitat loss from road construction and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats, facilitate predator movements, spread invasive plants, and increase human disturbance from noise and traffic (Forman and Alexander 1998).

Conditions in the Sub-region and in MZ IV. Infrastructure, such as ROWs and associated facilities and urbanization, is widespread throughout MZ IV. In some locations, infrastructure development has affected GRSG habitat. Development of roads and utility corridors has also contributed to habitat loss and fragmentation in portions of MZ IV. The best available estimates suggest about 25 percent of the MZ IV is within approximately 4 miles of urban development (Knick et al. 2011, p. 214). Impacts of infrastructure development in MZ IV are primarily related to highways, roads, power lines, and communication towers, with 90 percent of MZ I within 4 miles of a road, 30 percent within 4 miles of a power line, and 5 percent within 4 miles of a communication tower (Knick et al. 2011, pp. 215-216).

Although not representative of all infrastructure ROWs, transmission lines greater than 115 kVs indirectly influence 37 percent of priority habitat and 38 percent of general habitat across MZ IV. Indirect effects are assumed to occur to a radius of 4 miles (Manier et al. 2013, p. 41). Approximately 62 percent of transmission lines in priority habitat and 43 percent in general habitat are on BLM-administered lands across GRSG habitats in MZ IV (Manier et al. 2013, p. 41). In contrast, National Forest System lands contain 5 percent of transmission lines in priority habitat and 7 percent in general habitat. Therefore, BLM actions are likely to have a greater potential to affect transmission line ROWs in GRSG habitat than any other land management entity. Designating ROW exclusion and avoidance areas in PHMA and GHMA on BLM-administered and National Forest System lands could reduce the threat on these lands. However, in areas with scattered federal landownership, infrastructure may be routed around

federal lands, often increasing its length and impact. ROW avoidance and exclusion areas on BLM-administered and National Forest System lands could increase this tendency.

Impact Analysis. **Table 5.16**, Acres of Rights-of-Way Designations in GRSG Habitat in MZ IV, lists the areas of ROW avoidance and exclusion in GRSG habitat by alternative.

Table 5.16
Acres of Rights-of-Way Designations in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
Open to Rights-of-Way				
Alternative A	510,000	81%	1,671,000	0%
Alternative B	97,000	0%	1,671,000	0%
Alternative C	97,000	0%	1,671,000	0%
Alternative D	97,000	0%	1,672,000	<1%
Alternative E	97,000	0%	1,677,000	<1%
Proposed Plans	98,000	<1%	1,671,000	0%
Right-of-Way Exclusion				
Alternative A	787,000	0%	493,000	0%
Alternative B	1,151,000	32%	493,000	0%
Alternative C	1,200,000	34%	493,000	0%
Alternative D	787,000	0%	493,000	0%
Alternative E	787,000	0%	493,000	0%
Proposed Plans	787,000	0%	493,000	0%
Right-of-Way Avoidance				
Alternative A	10,653,000	0%	6,642,000	0%
Alternative B	10,653,000	0%	6,691,000	1%
Alternative C	10,653,000	0%	6,642,000	0%
Alternative D	11,065,000	4%	6,642,000	0%
Alternative E	11,092,000	4%	6,642,000	0%
Proposed Plans	11,092,000	4%	6,642,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within ROW designations in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

Alternative A (current management) has the most acres open to ROW/SUAs in PHMA. Across MZ IV, Alternatives B, C, D, and E would similarly reduce the number of open acres in PHMA, while in GHMA open acres would remain similar for all alternatives except Alternative B, which would reduce open acres.

Under the Proposed Plans, PHMA and GHMA would be avoidance for high-voltage transmission lines and major pipelines, Alternatives A, B and C would not contribute acres of ROW avoidance within MZ IV, as GRSG habitat would be managed as either open (under Alternative A) or ROW exclusion (Under Alternatives B and C). In contrast, Alternatives D and E and the Proposed Plans would manage PHMA as ROW avoidance, thereby increasing the acreage compared to Alternative A.

While the Proposed Plans leave the most acres of PHMA open to ROW/SUAs relative to all action alternatives, measures in the Proposed Plans, including applying disturbance screening criteria, RDFs, buffers, mitigation, and the disturbance and density caps, would reduce impacts on GRSG. The additional protections under the Proposed Plans provide the greatest net conservation gain to GRSG habitats and populations in the Utah Sub-region. The Proposed Plans are most likely to meet the COT report objective, which is to avoid development of infrastructure in PACs.

The numbers of ROW authorizations are anticipated to grow in the sub-region. Increasing populations, continued energy development, and new communication sites drive the need for new ROWs on both federal and non-federal lands.

New ROW authorizations that require state agency review or approval would be subject to the permitting process and stipulations for development in GRSG Core areas under the Utah and Montana executive orders. These stipulations would benefit the GRSG in Core areas by encouraging ROW development outside of core habitat areas, restricting surface occupancy near occupied leks, prohibiting power lines outside of designated corridors, and locating new roads used to transport products or waste away from occupied leks.

The effect of the alternatives and other conservation actions in the MZ (most notably the Utah and Montana executive orders) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. By implementing restrictions on infrastructure in PHMA and on state and private lands together, the cumulative beneficial effect on GRSG would be greater than the sum of their individual effects because protections would be applied more consistently across the landscape. This is especially important in areas of mixed land ownership patterns where complementary protections can benefit leks, early brood rearing habitat, or other important areas that do not follow geopolitical boundaries.

Reasonably foreseeable ROW development in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by restricting the type and location of developments. When restrictions in the Utah LUPA are added to these conservation actions, the impacts of future ROW developments would be further reduced. The Proposed Plans would provide the greatest net conservation gain to GRSG habitats and populations in MZ IV by providing the flexibility to site ROWs with the least impact on GRSG habitat.

Renewable Energy

Nature and Type of Effects. Impacts on GRSG from renewable energy development, such as that for wind and solar power, are similar to those from nonrenewable energy development. Additional concerns associated with wind energy developments are rotor blade noise, structure avoidance, and mortality caused by collisions with turbines (Connelly et al. 2004).

Conditions in the Sub-region and in MZ IV. Wind energy development is an increasing threat in some populations. There is currently no utility-scale wind energy development within occupied GRSG habitat in Utah. However, high wind potential exists in occupied GRSG habitat, but not in MZ IV.

Solar energy potential is low in MZ IV, and the there are no current applications for utility-scale solar production in the sub-region.

Although not representative of all renewable energy development, wind turbines indirectly influence less than 1 percent of priority habitat and general habitat combined across MZ IV. Private lands account for 82 percent of wind turbines affecting GRSG in priority habitat (and 62 percent in general habitat) within MZ IV. Therefore, conservation actions on private land are likely to have a greater potential to ameliorate the effects of wind energy development than any other single land management entity.

Impact Analysis. **Table 5.17**, Acres of Wind Energy Management Designations in GRSG Habitat in MZ IV, lists areas of wind energy ROW by alternative.

Table 5.17
Acres of Wind Energy Management Designations in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
Open to Wind Rights-of-Way				
Alternative A	413,000	100%	1,500,000	0%
Alternative B	0	0%	1,500,000	0%
Alternative C	0	0%	1,500,000	0%
Alternative D	0	0%	1,501,000	<1%
Alternative E	0	0%	1,506,000	<1%
Proposed Plans	0	0%	1,500,000	0%
Wind Right-of-Way Exclusion				
Alternative A	10,148,000	0%	1,261,000	0%
Alternative B	10,951,000	3%	1,261,000	0%
Alternative C	11,000,000	4%	1,261,000	0%
Alternative D	10,999,000	4%	1,261,000	0%
Alternative E	10,148,000	0%	1,261,000	0%
Proposed Plans	10,587,000	4%	1,261,000	0%
Wind Right-of-Way Avoidance				
Alternative A	1,390,000	0%	6,046,000	0%
Alternative B	1,390,000	0%	6,095,000	1%
Alternative C	1,390,000	0%	6,046,000	0%
Alternative D	1,390,000	0%	6,046,000	0%
Alternative E	1,829,000	24%	6,046,000	0%
Proposed Plans	1,390,000	0%	6,046,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within wind energy management designations in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

In the Utah Sub-region, the action alternatives do not contribute to the wind open acres in GRSG habitat in MZ IV. Similarly, Alternatives B, C, and D, and the Proposed Plans do not contribute to wind avoidance acres in PHMA in MZ IV. All action alternatives would increase wind exclusion acres in PHMA, with exclusion acres highest under Alternative C, which would

reduce potential impacts on GRSG on BLM-administered and National Forest System lands the most.

The no action alternative would leave the most GRSG habitat open to wind ROWs, and would therefore have the greatest potential impact on GRSG populations and their habitat. Alternative D would designate PHMA as ROW exclusion for utility-scale wind projects. Alternative E would not exclude these projects in GRSG habitats, but they would be avoidance areas.

The Proposed Plans would manage PHMA and GHMA as exclusion for utility-scale solar facilities, and PHMA as exclusion for commercial wind facilities (see below). GHMA would be ROW avoidance for wind facilities. Wind developments would also be subject to the anthropogenic disturbance criteria, a three percent disturbance cap and 1 facility per 640 acre density cap, RDFs, buffers, and a mitigation requirement. The Proposed Plans would reduce potential impacts on GRSG relative to the No Action alternative and other action alternatives.

Projects that require state agency review or approval would be subject to the Utah and Wyoming executive order permitting processes. This would encourage wind energy development outside of SGMAs and Core Areas. Reasonably foreseeable renewable energy development in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state GRSG conservation efforts as well as wind energy restrictions in other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by restricting the location of developments. When restrictions in the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Grazing/Free-Roaming Equids

Nature and Type of Effects. In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. As a result, livestock grazing could cause changes in habitat that alter species abundances and composition in GRSG insect prey. Changes in plant composition could occur in varying degrees and could change vegetative structure, affecting cover for nesting birds. Grazing could also alter fire regimes (Davies et al. 2010).

If not managed properly, cattle and sheep grazing can compact soil, enrich soil with nutrients, trample vegetation and nests, directly disturb GRSG and negatively affect GRSG recruitment. Cattle and sheep also can reduce invertebrate prey for GRSG or increase their exposure to predators (Beck and Mitchell 2000, pp. 998-1,000; Knick 2011; Coates 2007, pp. 28-33). Grazing in riparian areas can destabilize streams and riverbanks, cause the loss of riparian shade, and increase sediment and nutrient loads in the aquatic ecosystem (George et al. 2011). Stock watering tanks can contribute to stream and aquifer dewatering and may concentrate livestock movement and congregation in sensitive areas (Vance and Stagliano 2007).

However, grazing can reduce the spread of invasive grasses, if applied annually before the grasses have dried. It also can be used to reduce fuel load (Connelly et al. 2004, p. 7, 28-30). Light to moderate grazing does not appear to affect perennial grasses, which are important to nest cover (Strand and Launchbaugh 2013).

For BLM-administered lands, Standards for Rangeland Health require the BLM to ensure that the environment contains all of the necessary components to support viable populations of sensitive, threatened, and endangered species in a given area relative to site potential. The BLM Washington Office IM 2009-018 requires that land health considerations, such as vegetation cover for GRSG, are primary considerations for prioritizing the processing of grazing authorizations.

Conditions in the Sub-region and in MZ IV. Livestock grazing is present and widespread on many land types, such as federal and private, across MZ IV. Rangeland health assessments have found that over 19 percent of BLM-administered grazing allotments in GRSG habitat in MZ IV are not meeting wildlife standards with grazing as a causal factor (Manier et al. 2013, p. 97). Additionally, nearly 2 million acres of GRSG habitat within MZ IV is federally managed wild horse and burro range (Manier et al. 2013, p. 102).

Perhaps the most pervasive change associated with grazing management in GRSG habitats throughout MZ IV is the construction of fencing and water developments (Knick et al. 2011, p. 224). Some barbed wire fences contribute to direct mortality through fence collisions (Stevens et al. 2011); water developments may contribute to the increased occurrence of West Nile virus (Walker and Naugle 2011).

Additional habitat modifications associated with grazing management are mechanical and chemical treatments to increase grass production, often by removing sagebrush (Knick et al. 2011). Standards for Rangeland Health protect habitat from elements detrimental to GRSG, but not all rangelands in MZ IV comply with these standards.

Wild horses also occur within MZ IV and the sub-region; within MZ IV, 5.7 percent of priority habitat is negatively influenced by free-roaming equids (Manier et al. 2013, p. 102). Six designated HMAs and nine herd areas occur on BLM-administered lands in MZ IV in the sub-region; no active wild horse and burro territories occur on National Forest System lands in the sub-region (**Section 3.11**, Wild Horses and Burros). The BLM establishes an AML for each HMA, which represents the population objective.

Impact Analysis. On all lands in the sub-region, the BLM manages livestock grazing on 12,129,800 acres, encompassing 2,654 grazing allotments, while the Forest Service manages 9,646,900 acres encompassing 319 grazing allotments. **Table 5.18**, Acres Available and Unavailable to Livestock Grazing in GRSG Habitat in MZ IV, lists the acres of PHMA and GHMA available and unavailable for grazing, by alternative.

Under Alternative A, grazing management would continue under current guidance, which includes range improvement detrimental to GRSG. Permit renewals and Rangeland Health evaluations would help maintain rangeland vegetation, incidentally benefitting GRSG habitat. Under Alternative B, grazing numbers would be maintained but GRSG-specific habitat improvements would be incorporated into grazing management, reducing the likelihood of impacts described above. Alternative D and the Proposed Plans would have impacts similar to Alternative B, but would include more specific management guidance. Under Alternative E, GRSG-specific management would not be incorporated but the alternative does include

Table 5.18
Acres Available and Unavailable to Livestock Grazing in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
Available to Livestock Grazing				
Alternative A	11,661,000	3%	8,679,000	0%
Alternative B	11,254,000	0%	8,727,000	1%
Alternative C	11,254,000	0%	8,679,000	0%
Alternative D	11,254,000	0%	8,679,000	0%
Alternative E	11,254,000	0%	8,685,000	<1%
Proposed Plans	11,687,000	4%	8,679,000	0%
Unavailable to Livestock Grazing				
Alternative A	262,000	0%	124,000	0%
Alternative B	262,000	0%	124,000	0%
Alternative C	668,000	61%	124,000	0%
Alternative D	262,000	0%	124,000	0%
Alternative E	262,000	0%	124,000	0%
Proposed Plans	262,000	0%	124,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA available and unavailable to livestock grazing in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

guidance for incorporating management changes in GRSG habitat, which could lead to limited improvement of GRSG habitat from grazing management. Alternative C would remove or greatly limit livestock grazing in GRSG habitat areas. Although this action would reduce the degradation of habitat from grazing in GRSG population areas, it could have the indirect impact of increasing grazing use on private lands if federal lands were to be made unavailable. In addition, ranches which were unable to maintain economic viability in the absence of grazing privileges on federal land could be sold for development, resulting in permanent loss of GRSG habitat with potentially severe cumulative impacts on GRSG populations.

The COT report objectives for livestock grazing are to manage grazing in a manner consistent with local ecological conditions. This management would maintain or restore healthy sagebrush shrub and native perennial grass and forb communities and conserve essential habitat components for GRSG. Restoration to meet these standards and adequate monitoring would be required. The COT report also states that land managers should avoid or reduce the impact of range management structures on GRSG habitat.

Under the Proposed Plans, processing of grazing permits/leases and land health assessments would be prioritized in SFA followed by PHMA outside of SFA, which would lead to improved grazing management and lessened impacts on GRSG in the highest-quality habitat for the species. There are three areas of SFA in MZ IV, in parts of Oregon, Nevada, and Idaho.

Reasonably foreseeable livestock grazing management efforts in MZ IV are expected to increase over the analysis period (**Section 5.4.8**), through increased NRCS conservation actions under

the Sage-Grouse Initiative (e.g., fence marking and conservation easements), state efforts to maintain ranchland, and the implementation of other BLM and Forest Service LUPAs in MZ IV. When grazing management within the Utah LUPA is added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Under all alternatives, the BLM and Forest Service have the ability to adjust AML of wild horses if resource damage occurs; however, only Alternatives B through E and the Proposed Plans provide management guidelines specific to GRSG habitat (e.g., prioritizing gathers in GRSG habitat), which would benefit the species more than Alternative A. Alternative C (C1) would reduce AML by 25 percent.

Reasonably foreseeable wild horse management efforts are projected to increase over the analysis period (**Section 5.4.8**) with implementation of other BLM and Forest Service LUPAs in MZ IV. Other past, present, and reasonably foreseeable future actions are unlikely to affect the threat from wild horses and burros, as these animals are federally managed. When wild horse management within the Utah LUPA is added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV. Impacts may be reduced to the greatest extent under the Proposed Plans, where AMLs would be evaluated with consideration of GRSG habitat objectives for BLM-administered and National Forest System lands.

Conversion to Agriculture

Nature and Type of Effects. Converting sagebrush habitat to agricultural use, commonly referred to as sodbusting, causes direct loss of habitat available for GRSG. Habitat loss also decreases the connectivity between seasonal habitats, increasing population isolation and fragmentation. Fragmentation then increases the probability for decline of the population, reduced genetic diversity, and extirpation from stochastic events (Knick and Hanser 2011).

In addition to reducing the land area available to support GRSG, habitat loss and fragmentation also increase the likelihood of other disturbances, such as human traffic, wildfire, and invasive plant spread.

Converting cropland has eliminated or fragmented sagebrush on private lands in areas with deep fertile soils or irrigation potential. Sagebrush remaining in these areas has been limited to the agricultural edge or to relatively unproductive environments.

Conditions in the Sub-region and in MZ IV. Regional assessments estimate that while only 1 percent of priority habitat and general habitat in MZ IV are directly influenced by agricultural development, over 85 percent of these habitats are within approximately 4 miles of agricultural land (Manier et al. 2013, pp. 250-251).

Impact Analysis. The BLM and Forest Service do not convert public lands to agriculture. As such, the only direct authority these agencies have over conversion to agriculture is by retaining or disposing of lands in the realty program. Lands retained under BLM and Forest Service management will not be converted to agriculture and disposing of lands could increase the likelihood they will be converted to agriculture, depending on their location and new management authority.

As shown below in **Table 5.19**, Acres Identified for Retention and Disposal in GRSG Habitat in MZ IV, these acreages vary little in the sub-region or in MZ IV among the alternatives.

Table 5.19
Acres Identified for Retention and Disposal in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
Acres Identified for Retention				
Alternative A	11,533,000	0%	8,627,000	0%
Alternative B	11,535,000	<1%	8,628,000	<1%
Alternative C	11,536,000	<1%	8,627,000	0%
Alternative D	11,535,000	<1%	8,627,000	0%
Alternative E	11,533,000	0%	8,627,000	0%
Proposed Plans	11,973,000	4%	8,627,000	0%
Acres Identified for Disposal				
Alternative A	6,000	33%	178,000	0%
Alternative B	4,000	0%	179,000	1%
Alternative C	4,000	0%	178,000	0%
Alternative D	4,000	0%	179,000	1%
Alternative E	7,000	29%	178,000	0%
Proposed Plans	4,000	0%	178,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA identified for retention and disposal in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

Under Alternatives B, C, D, and E, and the Proposed Plans, the BLM and Forest Service would generally retain GRSG habitat, thereby eliminating the possibility that GRSG habitat would be converted to agricultural use. Alternatives A and E do not specify retention of GRSG habitat, and thus there is the possibility of these lands being disposed. However, land tenure adjustments require site-specific NEPA analysis and land sales must meet the disposal criteria under applicable law. BLM and Forest Service land tenure adjustments are not anticipated to be a significant contributing element to the threat of agriculture conversion.

Lands identified for disposal in MZ IV are typically small isolated parcels that are difficult to manage and do not represent suitable GRSG habitat. Parcels determined to have GRSG habitat value would not likely meet the disposal criteria for all action alternatives, unless disposal were seen to have a net conservation gain.

Cumulative impacts vary relatively little across alternatives, and BLM and Forest Service management may have little impact on alleviating this threat. Restrictions on grazing on federal land could increase agricultural pressure on adjacent private lands. If the loss of federal grazing privileges makes ranching economically unviable, the potential conversion of private grazing lands to agriculture would increase. The Proposed Plans do not substantially increase acreage unavailable to grazing.

In addition to agricultural conversion, federal lands may also be lost to urban development or transfer to other agencies. To prevent such transfer or loss, the BLM or Forest Service can establish special designations (e.g., ACECs and Zoological Areas) to provide protection to GRSG habitats through special management prescriptions that provide broad protection from habitat fragmentation, loss, and human disturbance. Alternative C would designate 15 ACECs and Zoological Areas in PHMA, which would retain lands under BLM and Forest Service management, thereby protecting them from conversion to other uses, such as agriculture or urban development. Thus, this alternative would provide the highest degree of protection for habitat associated with ACEC management in combination with management for other special areas. Other policies that may reduce risk of isolation and fragmentation include vegetation management to restore sagebrush habitat, including conifer removal and invasive weed treatments, fire suppression, and restrictions on infrastructure and energy development. In all of these areas, the action alternatives, including the Proposed Plans, provide more protective policies for GRSG habitat than current management.

The COT report objectives for converting land to agriculture are to avoid further loss of sagebrush habitat for agricultural activities (both plant and animal production) and to prioritize restoration. In areas where taking agricultural lands out of production has benefited GRSG, the programs supporting these actions should be targeted and continued (USFWS 2013a, p. 48). In accordance with this objective, the NRCS's Sage-Grouse Initiative focuses on maintaining ranchland that provides habitat for GRSG.

This voluntary program provides private landowners with monetary incentives to protect GRSG habitat, often through conservation easements. As a result, private land containing GRSG habitat is protected from conversion to agriculture or other development for the life of the conservation agreement. The conservation easements and other conservation incentives, such as restoration of water features and fence marking, can enhance the ability of private ranchlands to support GRSG.

Over the analysis period, conversion to agriculture is expected to increase (**Section 5.4.8**), though state and private conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat. When land tenure decisions within the Utah LUPA are added to these conservation actions, this would result in net conservation gain to GRSG habitats and populations in MZ IV.

Energy Development and Mining

The COT report states that energy development should be designed to ensure that it will not impinge on stable or increasing GRSG population trends. For mining, the COT report objective is to maintain stable to increasing GRSG populations and no net loss of GRSG habitats in areas affected by mining (USFWS 2013a, p. 49).

There are approximately 1,137,700 acres of GRSG habitat in MZ IV where energy and mineral development (including geothermal, mineral materials, wind energy, and non-energy leasable minerals) is presently occurring. There are 6,553,300 acres indirectly influenced by energy development (including oil and gas, mineral materials, and wind energy; indirect effects were not quantified for geothermal and nonenergy leasable mineral developments) (Manier et al. 2013, pp. 52-71). Geothermal energy development potential is high throughout WAFWA MZ IV. Few oil

and gas wells exist in the MZ, and less than 350,000 acres (1 percent) of GRSG habitats are currently leased for federal fluid mineral exploration. Coal potential is also low throughout the MZ.

Oil and Gas

Nature and Type of Effects. As discussed in **Section 4.3**, oil and gas development impacts GRSG and sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors. Indirect disturbances result from noise, gaseous emissions, changes in water availability and quality, and human presence. These factors could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005).

Oil and gas development results in direct loss of habitat from well pad and road construction as well as indirect disturbance impacts from increased noise and vehicle traffic. Oil and gas development also directly impacts GRSG through the species' avoidance of infrastructure. This development can also impact GRSG survival or reproductive success. Indirect effects include habitat quality changes, predator communities, and disease dynamics (Naugle et al. 2011).

Conditions in the Sub-region and in MZ IV. There is currently no oil and gas development within MZ IV (Manier et al. 2013, p. 52) and approximately 346,000 acres (1 percent) of GRSG habitat are leased but undeveloped (Manier et al. 2013, p. 55). Less than one percent of GRSG habitat in MZ IV is within 1.8 miles of oil and gas wells (Knick et al. 2011, p. 240).

Although oil and gas activities have a disproportionately greater effect on private lands, regulatory mechanisms on both federal surface and split estate lands in MZ IV are influential. Split estate lands with federal subsurface minerals may provide mitigation for impacts on GRSG habitat on private surface lands that would not be required on lands with both privately held surface and subsurface.

According to the RFD scenario (**Appendix R**), permanent disturbance associated with oil and gas development is projected to occur on less than 400 acres within the MZ over the next 10 years, representing less than one percent of GRSG habitat within either the sub-region or MZ IV. The potential for impacts would be reduced where areas are closed to fluid mineral leasing and where NSO and CSU/TL stipulations are applied. Given the small acreage and implementation of RDFs (**Appendix G**), the likelihood for impacts on GRSG habitat on BLM-administered and National Forest System lands is anticipated to be small and localized under all alternatives.

Impact Analysis. **Table 5.20**, Acres Open and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ 1V, and **Table 5.21**, Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ 1V, provide a quantitative summary of fluid mineral leasing conditions on BLM-administered and National Forest System lands across MZ IV, followed by an analysis of the Utah Sub-regional alternatives.

Table 5.20
Acres Open* and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
Open* to Fluid Mineral Leasing				
Alternative A	269,000	100%	0	0%
Alternative B	0	0%	49,000	98%
Alternative C	0	0%	0	0%
Alternative D	0	0%	0	0%
Alternative E	0	0%	5,000	80%
Proposed Plans	0	0%	0	0%
Closed to Fluid Mineral Leasing				
Alternative A	1,507,000	0%	1,308,000	0%
Alternative B	1,958,000	23%	1,308,000	0%
Alternative C	2,018,000	25%	1,308,000	0%
Alternative D	1,507,000	0%	1,308,000	0%
Alternative E	1,507,000	0%	1,308,000	0%
Proposed Plans	1,507,000	0%	1,308,000	0%

Source: BLM 2015
*Open with standard lease terms and conditions. This table displays the acres of PHMA and GHMA open and closed to fluid mineral leasing in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

Table 5.21
Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
NSO Stipulations				
Alternative A	10,809,000	<1%	3,828,000	0%
Alternative B	10,802,000	0%	3,829,000	<1%
Alternative C	10,802,000	0%	3,828,000	0%
Alternative D	11,099,000	3%	3,829,000	<1%
Alternative E	10,849,000	<1%	3,830,000	<1%
Proposed Plans	11,354,000	5%	3,828,000	0%
CSU/TL Stipulations				
Alternative A	203,000	100%	5,037,000	0%
Alternative B	0	0%	5,038,000	<1%
Alternative C	0	0%	5,037,000	0%
Alternative D	203,000	100%	5,052,000	<1%
Alternative E	505,000	100%	5,037,000	0%
Proposed Plans	0	0%	5,037,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA with NSO Stipulations and CSU/TL Stipulations in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

All action alternatives would provide protection to GRSG in the MZ by closing PHMA to new leases (with standard stipulations). This would reduce well density and impacts associated with construction and operation. Alternatives B and C would close PHMA to new fluid mineral leasing. Alternatives D and E and the Proposed Plans would not close more PHMA than the No Action Alternative. However, Alternative D and E and the Proposed Plans would impose NSO stipulations in PHMA, and CSU limitations in GHMA. The Proposed Plans would provide additional protections to GRSG from fluid mineral development by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap and 1 facility per 640 acre density cap, buffers, mitigation requirements (**Appendix D**), and RDFs (**Appendix G**). Land within SFA would be managed as NSO without waivers, exceptions, or modifications. Together, the measures in the Proposed Plans would minimize habitat loss and fragmentation and maintain conditions that meet GRSG life history needs.

All BLM and Forest Service Proposed Plans within MZ IV include RDFs to minimize impacts on GRSG from oil and gas development on federal lands. In areas where mineral estate is currently unleased, these tools can be applied to future leases; in areas that are already leased, BMPs can be applied as COAs for development of existing leases. Examples include locating new compressor stations outside of PHMA to reduce noise disturbance; clustering operations and facilities as closely as possible; placing infrastructure in already disturbed locations where the habitat has not been fully restored; and restoring disturbed areas at final reclamation to the pre-disturbance landforms and desired plant communities. State plans contain similar measures to reduce impacts.

Restoring disturbed habitats would require the reestablishment of native shrubs and forbs, including big sagebrush, which would benefit GRSG; however, restored habitats may not support GRSG for long periods following restoration (Arkle et al. 2014). For this reason, successful restoration may not be successful without a nearby source population.

The effect of the alternatives and other conservation actions in the MZ (most notably the Utah and Montana executive orders) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. For example, applying buffers in PHMA and on state and private land would effectively conserve larger blocks of land than if these actions occurred individually. This would provide a landscape-scale net conservation benefit, especially in areas where little development has occurred to date.

Reasonably foreseeable oil and gas development in MZ IV is negligible though it is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain due in large part to implementation of NSO stipulations, anthropogenic disturbance caps, and adaptive management that would minimize future disturbances to GRSG habitats and populations in MZ IV.

Geothermal

Nature and Type of Effects. Impacts on GRSG from geothermal development are not well documented since geothermal development has been too recent to identify any immediate or

lag effects (Knick et al. 2011 in Manier et al. 2013, p. 70). However, geothermal development is similar to fluid mineral development and direct impacts on habitats would occur from development of power plants, access roads, pipelines, and transmission lines. As a result, impacts of geothermal developments to GRSG from direct habitat loss, habitat fragmentation via roads and transmission lines, noise, and increased human presence (Connelly et al. 2004) may be similar to those discussed for nonrenewable energy development. Comparable effects on local GRSG populations are also anticipated (Manier et al. 2013, p. 70). Other concerns related to geothermal energy development include air and water pollution, disposal of hazardous waste, land subsidence, and release of toxic gases into the environment (Manier et al. 2013, p. 70).

Conditions in the Sub-region and MZ IV. Geothermal energy development potential is particularly high throughout MZ IV and geothermal leases directly affect 75,900 acres (less than 1 percent) of GRSG habitats in the MZ (Manier et al. 2013, p. 71). Geothermal leases in the sub-region cover 60,000 acres (**Section 3.20**, Renewable Energy). The RFD scenario for the Utah Sub-region predicts an increase in geothermal development over the next 15 years.

Impact Analysis. The potential for impacts would be reduced where areas are closed to fluid mineral leasing and where NSO and CSU/TL stipulations are applied. Given the small acreage and implementation of RDFs, the likelihood for impacts on GRSG habitat is anticipated to be small and localized under all alternatives.

Reasonably foreseeable geothermal energy development in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Coal

Coal potential is low throughout MZ IV (Manier et al. 2013, p. 133) and there are no direct or indirect effects from surface coal leases in the MZ (Manier et al. 2013, p. 74). There is no coal development in this portion of the Utah Sub-region and lands are determined to be unsuitable for leasing; thus, this threat will not be detailed further in this MZ.

Mineral Materials

Nature and Type of Effects. Development of surface mines (for sand, gravel and other common mineral materials found in MZ IV) may negatively impact GRSG numbers and disrupt the habitat and life-cycle of the species, similar to other types of mining activities (Braun 1998; Manier et al. 2013, pp. 70-71).

Conditions in the Sub-region and in MZ IV. There are 652,000 acres of mining and mineral materials disposal sites (not including minerals mined as energy sources) on BLM-administered surface land on priority habitat and general habitat in MZ IV. There are 1,049,600 acres across all landownership types, making BLM-administered land the largest contributor to direct effects from this threat. National Forest System lands contribute to direct effects on 170,200 acres of priority habitat and general habitat. Indirect effects are estimated to 1.5 miles out from the direct effects area (Manier et al. 2013, p. 77).

The mineral materials currently being developed for commercial purposes in MZ IV include stone, sand and gravel, limestone, soil, and pumice.

Across MZ IV, PHMA and GHMA are most affected by mining and mineral materials disposal sites on BLM-administered lands. GRSG may be directly impacted, being in the path of development; however, indirect impacts on habitat affect a much wider population of birds. In total, 61 percent of priority habitat and 48 percent of general habitat influenced by the indirect impact of mining and mineral materials disposal sites are on BLM-administered land. This does not include minerals mined as energy sources. Mining and mineral materials disposal sites on private land, by comparison, indirectly affect 26 percent of priority habitat and 34 percent of general habitat. National Forest System lands indirectly affect 10 percent of priority habitat and 13 percent of general habitat (Manier et al. 2013, p. 77). As a result, management of mining and material disposal sites on BLM-administered land would have the greatest impact on GRSG habitat conditions. For example, closure of BLM-administered lands to mineral material disposal could shift mineral material disposal in the MZ onto adjacent lands.

Impact Analysis. **Table 5.22**, Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ IV, provides a quantitative summary of acreages of BLM-administered and National Forest System lands open and closed to mineral material disposal across MZ IV.

Table 5.22
Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		**General Habitat Management Areas**	
	MZ IV	***Percent Within Sub-region***	**MZ IV**	***Percent Within Sub-region***
Open to Mineral Material Disposal				
Alternative A	519,000	99%	8,609,000	0%
Alternative B	5,000	0%	8,672,000	1%
Alternative C	5,000	0%	8,609,000	0%
Alternative D	5,000	0%	8,624,000	<1%
Alternative E	556,000	99%	8,615,000	<1%
Proposed Plans	5,000	0%	8,609,000	0%
Closed to Mineral Material Disposal				
Alternative A	12,299,000	0%	1,529,000	0%
Alternative B	12,750,000	4%	1,529,000	0%
Alternative C	12,813,000	4%	1,529,000	0%
Alternative D	12,798,000	4%	1,530,000	<1%
Alternative E	12,299,000	0%	1,529,000	0%
Proposed Plans	12,850,000	4%	1,529,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to mineral material disposal in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

Under Alternative A, most public lands within the sub-region are open to mineral material disposal. Specific closures of areas to mineral materials such as ACECs or crucial or essential wildlife habitat exist throughout the sub-region; however, this alternative provides the least

protection to GRSG or GRSG habitat. Under Alternatives B, C, and D, and the Proposed Plans, PHMA would generally be managed as closed to mineral material disposal. Acres of GHMA open to disposal would be approximately the same under all alternatives. Under Alternative E, GRSG habitat would not be closed to mineral materials disposal, but would be open with stipulations. Acres closed in GHMA would be similar across most alternatives, though Alternative E would have the greatest amount of acres of GHMA closed.

The Proposed Plans would close PHMA to new mineral materials sales, though PHMA would remain open to expansion of existing pits. GHMA would remain open under the Proposed Plans. The Proposed Plans would provide additional protections to GRSG from mineral material development by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap, RDFs, buffers, and mitigation. These closures and restrictions would reduce the effect on GRSG from mineral material development on BLM-administered and National Forest System lands in MZ IV for most action alternatives. However, these actions may shift development onto non-federal lands, with potentially greater impacts on GRSG. This is because similar protective stipulations and permit requirements might not apply on those other lands.

New mineral material disposal authorizations that require state agency review or approval would be subject to the permitting process and stipulations for development in GRSG Core areas under the Utah state conservation plan for GRSG. These stipulations would benefit the GRSG in SGMAs by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from mineral material disposal. These stipulations would be of particular benefit on privately owned surface and subsurface lands, where BLM and Forest Service protective regulatory mechanisms do not apply.

Reasonably foreseeable mineral materials development in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Locatable Minerals

Nature and Type of Effects. Locatable minerals include gold, silver, uranium, and bentonite. Activities associated with locatable mineral development, such as stockpiling topsoil and extracting and transporting material, would cause mortality and nest disruption. These actions also would reduce the functionality of the surrounding habitat with noise and light disturbance, resulting in lost and degraded PHMA and GHMA.

As with fluid mineral development, reclamation practices may help to reduce long-term impacts on GRSG and their habitat. Although disturbed areas have not been restored to near pre-disturbance conditions in the past, recent efforts have been directed toward restoring functional habitat. Future reclamation should be focused on restoring habitats capable of supporting viable GRSG populations. Even with effective restoration, restored areas may not support GRSG populations at the same level as prior to disturbance.

Conditions in the Sub-region and in MZ IV. The primary locatable minerals in commercially viable quantities in MZ IV are zeolite and bentonite, mainly in Idaho and Montana. Locatable minerals are known to exist in the sub-region, but they are currently uneconomical to produce.

Impact Analysis. As shown in **Table 5.23**, Acres Open and Recommended for Withdrawal from Mineral Entry in GRSG Habitat in MZ IV, acres of GRSG habitat recommended for withdrawal represents a relatively small influence, compared to the broader MZ. However, withdrawals in the sub-region would still influence the threat on a MZ-wide scale.

Table 5.23
Acres Open and Recommended for Withdrawal from Mineral Entry in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent Within Sub-region***	**MZ IV**	***Percent Within Sub-region***
Open to Mineral Entry				
Alternative A	6,137,000	8%	9,960,000	0%
Alternative B	5,623,000	0%	10,023,000	1%
Alternative C	5,623,000	0%	9,960,000	0%
Alternative D	6,122,000	8%	9,975,000	<1%
Alternative E	6,174,000	9%	9,966,000	<1%
Proposed Plans	6,108,000	8%	9,960,000	0%
Recommended for Withdrawal from Locatable Mineral Entry				
Alternative A	5,906,000	0%	9,000	0%
Alternative B	6,358,000	7%	9,000	0%
Alternative C	6,421,000	8%	9,000	0%
Alternative D	5,906,000	0%	9,000	0%
Alternative E	5,906,000	0%	9,000	0%
Proposed Plans	5,974,000	1%	9,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open to mineral entry and recommended for withdrawal from locatable mineral entry in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

Because of the lack of locatable minerals in the Utah portion of MZ IV, the management alternatives in the Utah Sub-region for locatable mineral entry would not impact GRSG habitat. SFAs under the Proposed Plans would be recommended for withdrawal from locatable mineral entry, providing protection to GRSG populations in these important areas.

Under all alternatives, RDFs outlined in **Appendix G** would help minimize the impacts on GRSG from locatable mineral development on federal land. Clustering operations and facilities as close as possible and placing new infrastructure in already disturbed locations would reduce impacts on sagebrush habitats. The measures in the Proposed Plans would help to alleviate the threat and provide a net conservation gain to GRSG habitats and populations throughout MZ IV. This management would apply in combination with the lek buffers, RDFs, and other restrictions applied under state plans, and BLM and Forest Service planning efforts in other field offices.

Reasonably foreseeable locatable mineral development in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by applying RDFs. The disturbance caps in the Proposed Plans would not block locatable mineral entry projects, but any locatable mineral entry would be considered as disturbance under the cap. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Nonenergy Leasable Minerals

Nonenergy leasable minerals are materials such as phosphate, sulfates, silicates, and trona (sodium carbonate). Impacts on GRSG are similar to those described in **Section 5.4.4**, WAFWA Management Zone III.

Conditions in the Sub-region and in MZ IV. Existing leases for nonenergy leasable minerals represent a relatively small threat spatially, as 12,000 acres (less than 1 percent) of GRSG habitats in MZ IV are directly affected by existing prospecting permits (Manier et al. 2013, p. 71). Phosphate development occurs in southeastern Idaho. Nonenergy leasable potential in Utah is primarily located in MZ II.

Impact Analysis. **Table 5.24**, Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ IV, provides a quantitative summary of acreages of BLM-administered and National Forest System lands open and closed to nonenergy leasable mineral leasing across MZ IV.

Table 5.24
Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		**General Habitat Management Areas**	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
Open to Nonenergy Leasing				
Alternative A	515,000	100%	8,391,000	0%
Alternative B	0	0%	8,454,000	1%
Alternative C	0	0%	8,391,000	0%
Alternative D	459,000	100%	8,406,000	<1%
Alternative E	551,000	100%	8,397,000	<1%
Proposed Plans	0	0%	8,391,000	0%
Closed to Nonenergy Leasing				
Alternative A	12,303,000	0%	1,747,000	0%
Alternative B	12,755,000	4%	1,747,000	0%
Alternative C	12,818,000	4%	1,747,000	0%
Alternative D	12,343,000	<1%	1,747,000	0%
Alternative E	12,303,000	0%	1,747,000	0%
Proposed Plans	12,855,000	4%	1,747,000	0%

Source: BLM 2015

This table displays the acres of PHMA and GHMA open and closed to nonenergy leasing in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

Because of the small contribution of nonenergy leasable mineral mining in the Utah portion of MZ IV, the Utah alternatives' management would have minimal impact on GRSG habitat.

Reasonably foreseeable nonenergy leasable mineral development in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by providing additional protections such as disturbance caps, RDFs, and mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

Recreation

Nature and Type of Effects. Recreation, such as camping, bicycling, wildlife viewing, horseback riding, fishing, and hunting, can be dispersed; concentrated, such OHV use and developed campsites; and permitted, such as via a BLM SRP or Forest Service SUP. The BLM also manages SRMAs where recreation is a primary resource management consideration.

Recreation on federally administered lands that use the extensive network of double-track and single-track routes have an impact on sagebrush and GRSG. Ecological impacts of roads and motorized trails are mortality due to collisions; behavior modifications due to noise, activity, and habitat loss; alteration of the physical environment; nutrient leaching; erosion; invasive plants spread; increased use; and alteration by humans due to accessibility (Knick et al. 2011, p. 219). Recreation activities can degrade GRSG habitat through direct impacts on vegetation and soils, introduction or spread of invasive species, and habitat fragmentation. This occurs in areas of concentrated use, trailheads, staging areas, and routes and trails. Motorized activities, including OHV use, are expected to have a larger footprint on the landscape. They are anticipated to have the greatest level of impact due to noise levels compared to nonmotorized uses, such as hiking or equestrian use. Cross-country motorized travel is permitted in designated areas on BLM-administered lands but not National Forest lands.

Conditions in the Sub-region and in MZ IV. Human populations have increased and expanded, primarily over the past century and in the western portion of the sagebrush distribution (Knick et al. 2011, p. 212). With these expanding populations come greater human impacts (Leu et al. 2008).

Impact Analysis. **Table 5.25**, Acres of Travel Management Designations in GRSG Habitat in MZ IV, shows Acres of Travel Management Designations in GRSG Habitat in MZ IV.

As shown in **Table 5.25**, Alternative C would close the most acres of PHMA, and only Alternatives A and E would leave acreage in PHMA open to new routes. All alternatives would have most acres in PHMA limited to existing routes. Alternative E applies to National Forest System lands, which are all limited to existing routes under current management. Because of travel management planning, impacts on GRSG from recreational motorized vehicle use would be greatest under Alternative A; impacts would be reduced most under Alternatives C and D and the Proposed Plans.

Table 5.25
Acres of Travel Management Designations in GRSG Habitat in MZ IV

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ IV	***Percent within Sub-region***	**MZ IV**	***Percent within Sub-region***
		Open		
Alternative A	272,000	100%	1,000	0%
Alternative B	0	0%	3,000	33%
Alternative C	0	0%	1,000	0%
Alternative D	0	0%	1,000	0%
Alternative E	82,000	100%	7,000	86%
Proposed Plans	0	0%	1,000	0%
		Limited		
Alternative A	11,039,000	1%	8,629,000	0%
Alternative B	11,261,000	3%	9,116,000	1%
Alternative C	11,165,000	2%	8,629,000	0%
Alternative D	11,309,000	4%	9,069,000	<1%
Alternative E	11,255,000	3%	9,068,000	<1%
Proposed Plans	10,897,000	0%	9,068,000	5%
		Closed		
Alternative A	640,000	0%	117,000	0%
Alternative B	640,000	0%	177,000	0%
Alternative C	785,000	18%	117,000	0%
Alternative D	640,000	0%	177,000	0%
Alternative E	640,000	0%	177,000	0%
Proposed Plans	640,000	0%	177,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within travel management designations of open, limited and closed in MZ IV; it also displays the percentage of those acres that are found within the sub-region.

The COT report objectives for recreation are to maintain healthy native sagebrush communities, based on local ecological conditions, and to manage direct and indirect human disturbance (including noise) to avoid interruption of normal GRSG behavior (USFWS 2013a, p. 49). Limits on road use under the action alternatives and limits on OHVs would help meet these objectives.

Reasonably foreseeable recreation in MZ IV is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ IV would reduce the threat by providing additional protections such as disturbance caps and limitations on National Forest System lands. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ IV.

5.4.6 WAFWA Management Zones II/VII

Existing Conditions in MZ II/VII and the Utah Sub-region

This section summarizes existing conditions and past and present actions in the Utah Sub-region planning area (provided in more detail in **Chapter 3**) and MZ II/VII as a whole. Reasonably foreseeable future actions are discussed in **Section 5.4.8**.

GRSG Habitat and Populations

WAFWA MZs II/VII include eleven GRSG populations - Eagle-South Routt, Middle Park, Laramie, Jackson Hole, Wyoming Basin, Rich-Morgan-Summit, Uintah, North Park, Northwest Colorado, Parachute-Piceance-Roan Basin, and Meeker-White River - in Idaho, Montana, Wyoming, Utah, and Colorado (Garton et al. 2011). The bulk of the area constitutes the Wyoming Basin population (MZ II), which contains the largest regional extent and highest breeding density of GRSG in the western US. Several smaller areas occupied by GRSG are distributed around the Wyoming Basin population, especially to the south on the Colorado Plateau (Garton et al. 2011).

The population areas affected by the Utah Sub-region planning effort and that are within WAFWA MZ II include Wyoming-Uinta and Wyoming-Blacks Fork (Wyoming Basin), Rich Summit-Morgan (Rich), and Uintah. While GRSG are abundant and leks in northern portions of MZs II/VII are the most highly connected in the range (Knick and Hanser 2011), populations along the edges of MZs II/VII (i.e., the Colorado Plateau) are less robust, with low lek connectivity and are estimated to have a 96 percent chance of populations declining below 200 males by 2037 (Garton et al. 2011; Knick and Hanser 2011). A summary of the population areas in Utah is as follows (details for each population are found in **Section 3.3**).

- Currently, there are no known leks in the Wyoming-Uinta Population Area and one recorded lek in the Utah portion of the Wyoming-Blacks Fork Population Area.
- A portion of the Rich-Summit-Morgan GRSG population falls within MZ II, which predominantly is Rich County and contains the majority of the birds for this population area. Since this population is managed as a unit, the area will be described as a unit. This population area is large with 10-year lek counts that range from 444 to 1,721 males (estimated local population from 1,800 to 6,900 birds (UDWR 2013). The area is a mix of private, state, and federal landownership with areas of recreational activities (including dispersed cabins), agriculture, livestock grazing, some oil and gas development, some roads, and some transmission lines but appears to be stable to slightly declining.
- The Uintah GRSG Population Area is a series of clumped GRSG population areas including Halfway Hollow, Diamond Mountain, Blue Mountain, Three-Corners/Brown's Park, Lucerne, Deadman's Bench and Book Cliffs (except South Slope Uinta is in MZ III – Northeast Interior population). This area is large and spread out with 10-year lek counts that range from 247 to 913 males (estimated population of 968 to 3600 birds; UDWR 2013) and appears to be increasing (with the exception of Halfway Hollow, Deadman's Bench, and Book Cliffs). Identified threats are oil and gas development, conifer encroachment, and other human-

related fragmentation (e.g., agriculture, roads, power lines, houses). Bird numbers in Deadman's Bench and Book Cliffs have severely declined, assumed to be a result of past and current oil and gas development. To a lesser degree, energy development has impacted the southern portion of the Halfway Hollow Population Area.

Table 5.26, Management Jurisdiction in MZ II/VII by Acres of Priority and General Habitats, provides a breakdown of landownership and acres of GRSG habitat in MZ II/VII. As the table shows, approximately 52 percent of priority habitat and 47 percent of general habitat is on BLM-administered lands. Less than one percent of priority habitat and 2 percent of general habitat is on National Forest System lands. The remaining 18,028,000 acres (49 percent) of GRSG habitat in the MZs comprise private, local state, and other federal and tribal lands.

Table 5.26
Management Jurisdiction in MZ II/VII by Acres of Priority and General Habitats

	Total Surface Area (Acres)	Priority (Acres)	General (Acres)	Non-habitat (Acres)
MZ IV	92,776,100 (100%)	17,476,000 (19%)	19,200,200 (21%)	56,099,900 (60%)
BLM	30,295,000 (33%)	9,021,200 (30%)	9,012,500 (30%)	12,261,300 (40%)
Forest Service	23,558,800 (25%)	162,000 (<1%)	452,500 (2%)	22,944,300 (97%)
Tribal and Other Federal	7,086,200 (8%)	784,000 (11%)	1,354,600 (19%)	4,947,600 (70%)
Private	27,405,400 (30%)	6,233,900 (23%)	7,394,800 (27%)	13,776,700 (50%)
State	4,053,900 (4%)	1,244,800 (31%)	979,800 (24%)	1,829,300 (45%)
Other	376,700 (<1%)	30,100 (8%)	6,000 (2%)	340,600 (90%)

Source: Manier et al. 2013, p. 118

In MZ II/VII in Utah, there are approximately 2,256,900 acres of GRSG habitat, with BLM-administered lands accounting for 724,500 of those acres and National Forest System lands 181,100 acres. State and private lands account for the remainder, indicating the importance of conservation on both private and public lands.

Population Trends in Management Zones II/VII

The Wyoming Basin population within MZ II/VII is the largest population in the GRSG range with over 20,000 males attending leks annually. Although recent data suggests a population increase, long-term monitoring is trending downward and population modeling suggests this trend will continue (Garton et al. 2011). Between 2007 and 2013, this population showed a 63 percent decline in the estimated minimum male population attending leks in the population (Garton et al. 2015, p. 34).

Wyoming data suggest a cyclic pattern with population lows in 1995, 2002, and 2013 and peaks in 2000 and 2006. Actual trends are difficult to discern due to the lower survey effort prior to 2007, meaning the number and proportion of active/inactive leks is unknown. Since 2007, the number of active leks has remained stable (approximately 1,100 active leks), but the number of males/active lek has declined by more than half (from 42 to 17 males/lek). In northeast Wyoming, the decreasing number of active leks since 2007 suggests a population decline in that area, greater than that indicated by the average lek size. Similar population trends are suggested

at both state and local scales (Christiansen 2013).The Wyoming Basin population within Wyoming and extending into the Utah Sub-region (Lucerne, Wyoming-Uinta, and Wyoming-Blacks Fork populations areas) is at risk due to renewable and non-renewable energy development, long-term drought, and brush eradication programs (USFWS 2013a, p. 68).

The isolation of many other populations in WAFWA MZ II/VII makes them vulnerable to habitat loss and fragmentation. Subpopulation areas at greatest risk are on the Colorado Plateau in close proximity to energy development areas and face fragmentation risk from infrastructure. The two population areas in Utah in MZ II, Rich Summit-Morgan and Uintah, are both large and considered at low risk of fragmentation as a whole, though sub-populations within Uintah have been heavily impacted by oil and gas. Rich-Morgan-Summit is located partly in MZ II and partly in MZ III and had a 10 year average male lek count of 1,475 (UDWR 2013). The MZ II portion of the population is regarded as stable and at low risk (USFWS 2013a). The Uintah Population Area had a 10 year average male lek count of 567 (UDWR 2013) in seven sub-populations, and contains a significant population center for GRSG in Utah, Colorado, and Wyoming with strong connectivity to other portions of the population. The central and southern portions of the area contain fragmented populations with low connectivity. A portion of the Uinta Population Area is within MZ VII.

Across WAFWA MZ II/VII, livestock grazing ranks below energy development and urbanization as a threat in eastern portions of the range of GRSG (Stiver et al. 2006). Additionally, a large portion of central regions of MZs II/VII (close to 5 million acres) is federally managed wild horse and burro range, suggesting potential effects on GRSG from livestock grazing and the compounding effects of feral grazers (Manier et al. 2013).

Fire risk is generally low across this MZ with 10 percent of priority and general habitats at high risk for fire; however, areas in northern and southern portions of MZ VII are identified as having high fire risk (Manier et al. 2013).

Cheatgrass is distributed across the region, although with less abundance than in the Great Basin region. Current levels of disturbance have been sufficient to spread invasive species and the combination of drought-stress and over-utilization from grazing has allowed for local proliferation. In many areas, altering grazing rotations to increase the cover of native perennials may be sufficient to restore high-quality habitats (Manier et al. 2013).

Relevant Cumulative Actions

This cumulative effects analysis considers the incremental impact of the Utah Proposed LUPA and alternatives in combination with other past, present, and reasonably foreseeable future federal and non-federal actions on all lands in MZ II/VII. Where these actions occur within GRSG habitat, they would cumulatively add to the impacts of BLM- and Forest Service-authorized activities set forth in the Utah Proposed LUPA. In addition to the conservation efforts described above, relevant reasonably foreseeable future cumulative actions occurring on federal, private, or mixed landownership in MZ II/VII are described in the Proposed RMPAs/LUPAs for Northwest Colorado, Wyoming Greater Sage-Grouse, Lander, Bighorn Basin, Billings, Idaho and Southwestern Montana, and Utah RMPs/LUPAs, which are hereby incorporated by reference.

The following list includes large-scale past, present, and future actions within MZ II/VII that, when added to the Proposed Plans and alternatives for the Utah sub-region, could cumulatively affect GRSG (more detail is included in the table in **Section 5.4.8**):

- Pinedale Anticline Project, Wyoming
- Hiawatha Regional Energy Development Project, Wyoming, Colorado
- Oil Shale and Tar Sands Programmatic EIS, Wyoming, Colorado, Utah
- Gateway South Transmission Project, Wyoming, Colorado, Utah
- TransWest Express Transmission Line Project, Wyoming, Colorado, Utah, Nevada
- Gateway West Transmission Line Project, Wyoming, Idaho
- Riley Ridge to Natrona Pipeline Project, Wyoming
- Normally-Pressurized Lance Natural Gas Project, Wyoming
- Continental Divide – Creston Natural gas Project, Wyoming
- Moneta Divide Natural Gas and Oil Development Project, Wyoming
- Bird Canyon Field Infill Project, Wyoming
- Horseshoe Basin Unit, Wyoming
- Invasive Plant Management EIS, Wyoming, Colorado
- Energy and minerals development on adjacent state, private, and tribal lands, Utah (see **Appendix R**)

Several ROWs for utilities, pipelines and fiber-optic lines are approved or in development in the sub-region, affecting the Uintah Population Area. The Uintah Population Area has substantial numbers of coal (underground mining) and natural gas mining projects planned on both BLM-administered and National Forest System lands, as well as private and state lands, which could impact GRSG habitat. Underground coal mining and gas mining would also impact the Rich Population Area. In addition to these projects, invasive weed control, vegetation restoration, conifer removal, and fuels-treatment projects are ongoing and could result in beneficial impacts on GRSG habitat in both population areas (Uintah and Rich) in the short and long-term. Increasing recreation will continue to threaten the Uintah population while there is a relocation of two miles of a road within the Rich Population Area that will continue to impact GRSG. In the Rich Population Area, other threats to GRSG include the potential for energy development, including wind, and the potential for adding more structural range improvements on adjacent private lands.

Threats to GRSG in Management Zones II/VII

The COT report identifies the present and widespread threats facing GRSG in MZ II/VII as energy development, infrastructure, grazing/free-roaming equids, conversion to agriculture, fire, spread of weeds, and recreation (USFWS 2013a, pp. 17-19, 27-28). Each threat is discussed below.

Energy Development and Mining

The COT report states that energy development should be designed to ensure that it will not impinge on stable or increasing GRSG population trends. For mining, the COT report objective is to maintain stable to increasing GRSG populations and no net loss of GRSG habitats in areas affected by mining (USFWS 2013a, p. 49).

There are approximately 1,144,800 acres of GRSG habitat in MZ II/VII where energy and mineral development is presently occurring and over 30 million acres are indirectly influenced by energy development (including oil and gas, coal leasing, mineral materials, and renewables) (Manier et al. 2013, pp. 52-71). No geothermal energy development is presently occurring in MZ II/VII. Indirect influences are primarily linked to oil and gas development. Of the 80 percent of GRSG habitat in MZ II/VII indirectly influenced by oil and gas development, approximately 50 percent occurs on BLM-administered land, with most of the remainder on private lands (Manier et al. 2013, p. 52). Only one percent of oil and gas development affects National Forest System lands. Approximately seven percent of federal lands are closed to oil and gas leasing, but the majority of leased lands are presently undeveloped. BLM and Forest Service regulatory actions would primarily influence unleased areas by way of attaching stipulations, COAs, and other conservation measures on future leases.

Energy development is among the greatest threats to GRSG in MZs II/VII (Manier et al. 2013). It can result in direct habitat loss; fragmentation of important habitats by roads, pipelines, and power lines; noise; and direct human disturbance. The effects of energy development often add to the impacts from other human development and result in GRSG population declines. Population declines associated with energy development result from the lek abandonment, decreased attendance at leks that persist, lower nest initiation, poorer nest success, decreased yearling survival, and avoidance of energy infrastructure in important wintering habitat areas (Holloran 2005, pp. 38-39; Aldridge and Boyce 2007, p. 517; LeBeau 2012; Kirol 2012).

Across MZs II/VII, energy development – primarily oil and gas development – and supporting infrastructure are a major threat to GRSG habitats and populations (USFWS 2013a). Approximately 7.8 million acres (21 percent) of GRSG habitats in these MZs are currently leased for development of federal natural gas or oil reserves. The MZs also have leases for the research of oil shale extraction in the southern populations (Manier et al. 2013). Less than one percent of priority and general habitat are directly influenced by a natural gas or oil well, but 99 percent are within 11.8 miles, which one study has suggested is the distance to which some effects from wells could occur (Manier et al. 2013).

Oil and Gas

Nature and Type of Effects. Oil and gas development impacts GRSG and sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors; and indirectly from noise, gaseous emissions, changes in water availability and quality, and human presence. The interaction and intensity of effects could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004, p. 41; Holloran 2005, pp. 57-60).

Conditions in the Sub-region and in MZ II/VII. The Greater Green River Basin, Uintah-Piceance Basin, and North Park Basin are all important oil and gas reserves in MZs II/VII. In Wyoming,

which contains the bulk of the mineral estate, 52 percent is authorized for development (Naugle et al. 2011). Fluid mineral development would likely be concentrated where there are existing leases that are held by production, located mainly in the Uintah Population Area but exploratory wells may also be drilled in Rich Population Area. Approximately 15 percent of GRSG habitat in MZ II/VII is within 1.8 miles of oil and gas wells (Knick et al. 2011, p. 240). Oil and natural gas development-related wells indirectly influence over 50 percent of GRSG habitat on BLM-administered lands across MZ II/VII, occurring to a distance of 12 miles from the development. There are virtually no indirect impacts on National Forest System lands. Private surface lands account for 33 percent of the indirect impact in priority habitat and 37 percent in general habitat in MZ II/VII (Manier et al. 2013, p. 52). Thus, actions on BLM-administered land are likely to have a greater potential to ameliorate the adverse impacts of oil and gas development on GRSG habitat than any other single land management entity.

Though the BLM and Forest Service may restrict future leasing for oil and gas on BLM-administered and National Forest System lands within GRSG habitat, existing leases remain valid with potential for development based on locations of geologic fields for traditional oil and gas distributed extensively across eastern portions of GRSG range (Manier et al. 2013, p. 51). Oil and gas reserves are extensive across the Powder River Basin of northeastern Wyoming and southeastern Montana, the Wyoming Thrust Belt of extreme southwestern Wyoming, and the Southwest Wyoming Basin including portions of southwestern and central Wyoming. The Southwestern Wyoming and the Uinta–Piceance geological basins are both located partly in MZ II/VII, and coincide with high-density areas of GRSG, large numbers of leks, and the highest male attendance at leks compared with any areas in the eastern part of the range (USFWS 2010).

According to the RFD scenario (**Appendix R**), permanent disturbance associated with oil and gas development is projected to occur on approximately 7,000 acres within the sub-region in MZ II/VII over the next 15 years.

Impact Analysis. **Table 5.27**, Acres Open and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ 11/VII, and **Table 5.28**, Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ II/VII, provide a quantitative summary of fluid mineral leasing conditions on BLM-administered and National Forest System lands across MZ II/VII, followed by an analysis of the Utah Sub-regional alternatives.

All action alternatives would provide protection to GRSG in the MZs by closing at least a portion of PHMA to new leases (with standard stipulations). This would reduce well density and impacts associated with construction and operation. Alternatives B and C would close PHMA to new fluid mineral leasing. Alternatives D and E and the Proposed Plans would not close more PHMA than Alternative A. However, Alternatives D and E and the Proposed Plans would impose NSO stipulations in PHMA and CSU limitations in GHMA and would reduce new surface disturbances in GRSG habitat. The Proposed Plans would provide additional protections to GRSG from fluid mineral development by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap and 1 facility per 640 acre density cap, buffers, mitigation requirements (**Appendix D**), and RDFs (**Appendix G**). All of these actions would limit new habitat fragmentation, protect leks and key habitat from surface disturbance, and would maintain conditions that meet GRSG life history needs.

Table 5.27
Acres Open* and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open* to Fluid Mineral Leasing				
Alternative A	155,000	100%	2,268,000	0%
Alternative B	0	0%	2,373,000	4%
Alternative C	0	0%	2,268,000	0%
Alternative D	0	0%	2,268,000	0%
Alternative E	0	0%	2,378,000	5%
Proposed Plans	0	0%	2,378,000	5%
Closed to Fluid Mineral Leasing				
Alternative A	1,308,000	6%	1,165,000	1%
Alternative B	1,945,000	37%	1,165,000	1%
Alternative C	2,191,000	44%	1,165,000	1%
Alternative D	1,290,000	4%	1,165,000	1%
Alternative E	1,290,000	4%	1,165,000	1%
Proposed Plans	1,290,000	4%	1,165,000	1%

Source: BLM 2015
*Open with standard lease terms and conditions. This table displays the acres of PHMA and GHMA open and closed to fluid mineral leasing in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

Table 5.28
Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
NSO Stipulations				
Alternative A	3,796,000	<1%	1,272,000	0%
Alternative B	3,779,000	0%	1,281,000	1%
Alternative C	3,779,000	0%	1,272,000	0%
Alternative D	4,140,000	9%	1,281,000	1%
Alternative E	3,850,000	2%	1,281,000	1%
Proposed Plans	4,442,000	15%	1,281,000	1%
CSU/TL Stipulations				
Alternative A	5,932,000	9%	6,729,000	0%
Alternative B	5,383,000	0%	6,953,000	3%
Alternative C	5,384,000	<1%	6,729,000	0%
Alternative D	5,538,000	3%	7,084,000	2%
Alternative E	5,817,000	7%	6,956,000	3%
Proposed Plans	5,407,000	<1%	6,957,000	3%

Source: BLM 2015
This table displays the acres of PHMA and GHMA with NSO Stipulations and CSU/TL Stipulations in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

All BLM and Forest Service Proposed Plans within MZ II/VII include RDFs to minimize impacts on GRSG from oil and gas development on federal lands. In areas where mineral estate is currently unleased, these tools can be applied to future leases; in areas that are already leased, BMPs can be applied as COAs for development of existing leases. Examples include locating new compressor stations outside of PHMA to reduce noise disturbance; clustering operations and facilities as closely as possible; placing infrastructure in already disturbed locations where the habitat has not been fully restored; and restoring disturbed areas at final reclamation to the pre-disturbance landforms and desired plant communities. State plans contain similar measures to reduce impacts and would provide complementary protection on state lands.

The RDFs in **Appendix G** would help protect unfragmented habitats, minimize habitat loss and fragmentation, and maintain conditions that meet GRSG life history needs. For example, remote telemetry (e.g., monitoring oil and gas operations) would be used to reduce vehicle traffic, disturbance areas would be kept to a minimum, and vegetation would be removed only when necessary.

Up to nine new oil and gas projects are anticipated in the Uintah area (**Section 5.4.8**), but it is unclear to what extent these numbers would be reduced under the action alternatives. Due to the Utah Executive Order on non-BLM-administered and non-National Forest System lands, state regulators and oil and gas leaseholders would establish buffers around leks and breeding areas and reduce disturbance from existing energy development sites.

Implementing any alternative under the Utah Greater Sage-Grouse LUPA/EIS would not affect pending or future oil and gas development projects outside of the sub-region. For example, numerous oil and gas development projects are proposed in Wyoming (**Section 5.4.8**). However, the NSO buffer and the disturbance cap under the Wyoming Executive Order would reduce the threat to GRSG from oil and gas development on non-federal lands in MZ II/VII.

The effect of the alternatives and other conservation actions in the MZ (most notably the Utah and Wyoming executive orders) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. For example, applying buffers in PHMA and on state and private land would effectively conserve larger blocks of land than if these actions occurred individually. This would provide a landscape-scale net conservation benefit, especially in areas where little development has occurred to date.

Reasonably foreseeable oil and gas development in MZ II/VII is widespread and expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah Greater Sage-Grouse LUPA are added to these conservation actions, this would result in a net conservation gain due in large part to implementation of NSO stipulations, anthropogenic disturbance caps, and adaptive management that would minimize future disturbances to GRSG populations and habitats. However, given the high numbers of approved leases with projected new wells and associated transmission lines and ROWs, it is likely that oil and gas development would remain a threat to GRSG under any of the alternatives.

Coal

Nature and Type of Effects. Surface and underground mining for mineral resources, including coal, results in direct loss of habitat if they occur in sagebrush habitats. GRSG and nests could be directly affected by trampling or vehicle collision. GRSG also could be impacted indirectly from an increase in human disturbance, ground shock, noise, dust, reduced air and water quality, and changes in vegetation and topography (Brown and Clayton 2004). Industrial activity associated with the development of surface mines and infrastructure could result in noise and human activity that disrupt the habitat and life cycle of GRSG.

Coal mining and the use of coal to produce electricity has environmental impacts including soil erosion, dust, noise, water pollution, acid-mine drainage, and air emissions. Burning coal releases toxic fumes and particulate matter into the atmosphere and contributes to climate change (Manier et al. 2013, pp. 69-71). Development of surface mines and associated infrastructure (such as roads and power lines), noise, and human activity may negatively impact GRSG numbers (Braun 1998).

Conditions in the Sub-region and in MZ II/VII. Coal mines are widespread in southern portions of MZ II/VII, and federal leases developed through surface extraction directly influence approximately 52,100 acres of these MZs. There is the potential for additional coal mining in large portions of priority and general habitat in MZs II/VII. Indirect effects of surface coal mines suggest influence over approximately 8 percent of priority habitat across the range of the species and approximately 5 percent of priority habitat in MZ II/VII. Approximately 36 percent of priority habitat that is indirectly influenced by coal mines across the species' range are managed by BLM. Although coal companies have demonstrated that disturbed lands can be restored to a point that supports a diversity of vegetative species, including big sagebrush, there is little evidence that GRSG populations have reoccupied habitat disturbed by coal mining, at least in terms of lek establishment (Manier et al. 2013, pp. 70-71, 74).

Many areas have already been leased, and numerous additional natural gas, coal, and mining projects are planned, particularly in the Uintah Population Area. However, Utah does not have any reasonably foreseeable surface mining of coal in MZ II/VII; all development would be via underground mining.

Impact Analysis. The RFD scenario suggests that the development of coal resources in the sub-region would not vary considerably across alternatives. Furthermore, areas considered suitable for leasing will not necessarily be leased; the actual amount of leasing depends on factors such as price and regulatory safeguards.

Alternative B and C would designate PHMA as unsuitable within MZ II, while Alternative D and E and the Proposed Plans would not designate acreage as unsuitable. However, the Utah Proposed Plans and other BLM and Forest Service Proposed Plans in MZ II/VII would assess coal lease applications for suitability on a case-by-case basis, with PHMA considered essential habitat for GRSG. As a result, coal leasing, and its associated development impacts, within PHMA would be less likely under the Proposed Plans

Under all alternatives and the Proposed Plans, new coal lease applications on federal mineral estate would be subject to suitability determinations governed by 43 CFR, Part 3461.5. Under

unsuitability criterion 15, the BLM may determine that portions of the MZ contain essential GRSG habitat and are unsuitable for all or certain stipulated methods of coal mining. If the BLM made this determination, it would apply stipulations to restrict coal mining and protect GRSG, including possibly prohibiting surface coal mining. As such, the regulations under Criterion 15 of 43 CFR, Part 3461.5(o)(1) would reduce the potential for long-term impacts associated with new coal leasing projects on GRSG habitats and populations.

New coal leasing and development may also occur on non-federal lands in MZ III, subject to state regulations (including reclamation requirements). Additionally, new coal leasing in Utah would be subject to the 5 percent disturbance limit as required by the Utah Executive Order. These measures would help protect GRSG habitat on lands where 43 CFR, Part 3461.5(o)(1) do not apply.

Reasonably foreseeable coal development in MZ II/VII is expected to continue (**Section 5.4.8**), though the requirements of 43 CFR, Part 3461.5, Criterion 15, in combination with BLM planning efforts and state plans, would reduce the threat from coal extraction by restricting the location of developments and requiring mitigation. When restrictions in the Utah Greater Sage-Grouse LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Mineral Materials

Nature and Type of Effects. The impacts of mineral material development are similar to those described under **Section 5.4.4**.

Conditions in the Sub-region and in MZ II/VII. There are 846,600 acres of mining and mineral materials disposal sites (not including minerals mined as energy sources) on BLM-administered lands in PHMA and GHMA in MZ II/VII. There are 1,027,500 acres across all landownership types, making BLM-administered land the largest contributor to direct effects from this threat. National Forest System lands contribute to direct effects on 3,100 acres of priority and general habitat (Manier et al. 2013, p. 77).

According to Manier et al. (2013), indirect effects are estimated to 1.5 miles out from the direct effects area. In total, 65 percent of priority habitat and 60 percent of general habitat influenced by the indirect impact of mining and mineral materials disposal sites are on BLM-administered lands. This does not include minerals mined as energy sources. Mining and mineral materials disposal sites on private land, by comparison, indirectly affect 26 percent of priority and 32 percent of general habitat. National Forest System lands have virtually no indirect effects on priority and general habitat (Manier et al. 2013, p. 77). As a result, management of mining and material disposal sites on BLM-administered land would have the greatest impact on GRSG habitat conditions. For example, closure of BLM-administered lands to mineral material disposal could shift mineral material disposal in the MZ onto adjacent lands.

Impact Analysis. **Table 5.29**, Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ II/VII, shows acres of PHMA and GHMA open and closed to mineral material disposal in the MZ.

Table 5.29
Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open to Mineral Material Disposal				
Alternative A	8,270,000	13%	9,323,000	0%
Alternative B	7,156,000	0%	9,751,000	4%
Alternative C	7,156,000	0%	9,323,000	0%
Alternative D	7,156,000	0%	9,738,000	4%
Alternative E	7,837,000	9%	9,765,000	5%
Proposed Plans	7,181,000	<1%	9,762,000	4%
Closed to Mineral Material Disposal				
Alternative A	2,804,000	1%	1,388,000	0%
Alternative B	3,489,000	20%	1,390,000	<1%
Alternative C	3,918,000	29%	1,388,000	0%
Alternative D	3,489,000	20%	1,403,000	1%
Alternative E	2,802,000	1%	1,390,000	<1%
Proposed Plans	3,495,000	21%	1,390,000	<1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to mineral material disposal in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

Under Alternative A, most public lands within the sub-region are open to mineral material disposal. Under Alternatives B, C, and D, and the Proposed Plans, PHMA would generally be managed as closed to mineral material disposal. Acres of GHMA open to disposal would be approximately the same under all alternatives.

The Proposed Plans would close PHMA to new mineral materials sales, though PHMA would remain open to expansion of existing pits. GHMA would remain open under the Proposed Plans. The Proposed Plans would provide additional protections to GRSG from mineral material development by requiring anthropogenic disturbance criteria, a 3 percent disturbance cap, RDFs, buffers, and mitigation. These closures and restrictions would reduce the effect on GRSG from mineral material development on BLM-administered and National Forest System lands in MZ II/VII for most action alternatives. However, these actions may shift development onto non-federal lands, with potentially greater impact on GRSG. This is because similar protective stipulations and permit requirements might not apply on those other lands.

New mineral material disposal authorizations that require state agency review or approval would be subject to stipulations for development under both the Wyoming and Utah state conservation plans for GRSG. These stipulations would benefit GRSG by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from mineral material disposal. These stipulations would be of particular benefit on privately owned surface and subsurface lands, where BLM and Forest Service protective regulatory mechanisms do not apply.

Reasonably foreseeable mineral materials development in MZ II/VII is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by restricting the location of developments and requiring mitigation. When restrictions within the Utah Greater Sage-Grouse LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Locatable Minerals

Nature and Type of Effects. Locatable minerals development activities such as stockpiling topsoil and extracting and transporting material, w cause mortality and nest disruption. These actions w the functionality of the surrounding habitat with noise and light disturbance, resulting in lost and degraded GRSG habitat.

Conditions in the Sub-region and in MZ II/VII. The existing conditions specific to the Utah Sub-region are largely unknown, but mining of locatable federal mineral resources currently affects approximately 2.2 percent of GRSG habitat in the entire MZ II/VII (Manier et al. 2013, p. 74).

Impact Analysis. As shown in **Table 5.30**, Acres Open and Recommended for Withdrawal from Mineral Entry in GRSG Habitat in MZ II/VII, acres of GRSG habitat recommended for withdrawal represents a relatively small proportion of land, compared to the broader MZ. However, withdrawals in the sub-region would still reduce the threat on a MZ-wide scale.

Table 5.30
Acres Open and Recommended for Withdrawal from Mineral Entry in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open to Mineral Entry				
Alternative A	8,270,000	13%	8,797,000	0%
Alternative B	7,156,000	0%	9,751,000	4%
Alternative C	7,156,000	0%	8,797,000	0%
Alternative D	7,156,000	0%	9,738,000	4%
Alternative E	7,837,000	9%	9,765,000	5%
Proposed Plans	8,190,000	6%	8,940,000	2%
Recommended for Withdrawal from Locatable Mineral Entry				
Alternative A	732,000	1%	235,000	0%
Alternative B	1,355,000	46%	235,000	0%
Alternative C	1,493,000	51%	235,000	0%
Alternative D	732,000	1%	235,000	0%
Alternative E	732,000	1%	235,000	0%
Proposed Plans	893,000	18%	235,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open to mineral entry and recommended for withdrawal from locatable mineral entry in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

Under Alternative A, all lands are generally open to mineral extraction, and while there are specific locatable mineral withdrawals associated with particular ROWs, wilderness areas, ACECs and other management areas, there are no locatable mineral withdrawals specific to protecting GRSG habitat. Impacts on GRSG and its habitat would be greatest under Alternative A. Mitigating effects on GRSG and habitat are identified through the NEPA process approving plans of operation.

Alternatives B and C would increase restrictions and limitations for locatable minerals management in GRSG habitat and would thus provide conservation gains to GRSG relative to Alternative A, particularly Alternative C. Under Alternatives D and E, BLM-administered and National Forest System lands would generally remain open to locatable minerals as under Alternative A; however, protective stipulations would apply.

Subject to valid existing rights and applicable law, the Proposed Plans could provide additional protection to GRSG from locatable mineral development by requiring RDFs, buffers, and mitigation in both PHMA and GHMA, plus added mineral/energy density requirements, 3 percent disturbance cap, and seasonal restrictions in PHMA. These measures would be applied to the maximum extent allowable by law. Under the Proposed Plans, abandoned mine sites in GRSG habitat would be restored by eliminating physical structures that could provide nesting and/or perching sites for predators. Portions of SFAs would be recommended for withdrawal from locatable mineral entry. These measures would limit new surface disturbance and provide corresponding protection for GRSG habitats and populations from further habitat degradation.

New locatable mineral authorizations that require state agency review or approval would be subject to stipulations for development under both the Wyoming and Utah state conservation plans for GRSG. These stipulations would benefit GRSG by ensuring that projects avoid, minimize, and mitigate impacts on GRSG habitat from locatable mineral management. These stipulations would be of particular benefit on privately owned surface, where BLM and Forest Service protective regulatory mechanisms do not apply.

Under all alternatives, RDFs outlined in **Appendix G** would help minimize the impacts on GRSG from locatable mineral development on federal land. Clustering operations and facilities as close as possible and placing new infrastructure in already disturbed locations would reduce impacts on sagebrush habitats.

Reasonably foreseeable locatable mineral development in MZ II/VII is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by applying RDFs. The disturbance caps in the Proposed Plans would not block locatable mineral entry projects, but any locatable mineral entry would be considered as disturbance under the cap. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Nonenergy Leasable Minerals

Nature and Type of Effects. Nonenergy leasable minerals are materials such as phosphate, sulfates, silicates, and trona (sodium carbonate). Impacts on GRSG are similar to those described under **Section 5.4.4**.

Conditions in the Sub-region and in MZ II/VII. Existing prospecting permits for nonenergy leasable minerals directly affect 935,500 acres (2.5 percent) of GRSG habitats in MZ II/VII, which is the largest proportion of GRSG habitat compared with the other MZs (Manier et al. 2013, p. 79). Deposits of gilsonite and phosphate are located in the Uinta-Wasatch-Cache and Ashley National Forests portions of the Uintah Population Area, the south-central portion of the Wyoming-Uinta Population Area, and the southern portion of the Rich Population Area. Impacts would likely be concentrated in the Wyoming-Uinta Population Area, where potential is the highest for both the minerals and associated development.

Impact Analysis. **Table 5.31**, Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ II/VII, provides a quantitative summary of acreages of BLM-administered and National Forest System lands open and closed to nonenergy leasable mineral leasing across MZ II/VII.

Table 5.31
Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open to Nonenergy Leasing				
Alternative A	6,967,000	15%	7,511,000	0%
Alternative B	5,896,000	0%	7,928,000	5%
Alternative C	5,896,000	0%	7,511,000	0%
Alternative D	6,476,000	9%	7,928,000	5%
Alternative E	6,546,000	10%	7,941,000	5%
Proposed Plans	5,921,000	<1%	7,939,000	5%
Closed to Nonenergy Leasing				
Alternative A	3,002,000	2%	1,101,000	0%
Alternative B	3,639,000	20%	1,114,000	1%
Alternative C	4,068,000	28%	1,101,000	0%
Alternative D	3,059,000	4%	1,114,000	1%
Alternative E	2,984,000	2%	1,118,000	2%
Proposed Plans	3,646,000	20%	1,114,000	1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to nonenergy leasing in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

Alternatives B and C and the Proposed Plans would increase the acreage of PHMA closed to nonenergy leasing compared to current management (Alternative A) and Alternatives D and E. Acreage variations in GHMA are minimal at the MZ scale and as a result, cumulative effects on

GRSG in GHMA would be similar across alternatives. In PHMA, the Proposed Plans would provide additional protections compared to the other action alternatives by requiring a 3 percent disturbance cap, mineral/energy density and seasonal restrictions, buffers, RDFs, and mitigation.

Reasonably foreseeable nonenergy leasable mineral development in MZ II/VII is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by providing additional protections such as disturbance caps, RDFs, and mitigation. When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Infrastructure

Rights-of-Way

Nature and Type of Effects. As discussed under MZ III, human developments, such as power lines, communication towers, fences, roads, and railroads, contribute to habitat loss and fragmentation, with power lines and roads having the greatest effects (Connelly et al. 2004; Naugle et al. 2011). Human disturbance is increased over the short term during infrastructure construction. In the long term, increased threats from predators perching on infrastructure may cause declines in lek attendance or nest success. GRSG population declines have resulted from avoidance of infrastructure, reduced productivity, and/or reduced survival near infrastructure (Naugle et al. 2011).

Power lines can directly affect GRSG by posing a collision and electrocution hazard, and can have indirect effects by decreasing lek attendance and recruitment, increasing predation, reducing connectivity, and facilitating the invasion of invasive plants (Braun 1998, pp. 145-146; Connelly et al. 2004, pp. 12, 25). In particular, power poles and crossarms provide perches and nesting habitat for potential avian predators, such as golden eagles and ravens (Ellis 1985). Higher densities of power lines within 4 miles of a lek negatively influence lek attendance (Walker et al. 2007a). In addition, power lines are linear and often extend for many miles. Thus, ground disturbance associated with power line construction, as well as vehicle and human presence during maintenance activities, may introduce or spread invasive weeds over large areas, thereby degrading habitat.

Potential impacts from roads include direct habitat loss from construction and mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats. Other impacts include facilitation of predator movements, spread of invasive plants, and human disturbance from noise and traffic (Forman and Alexander 1998, pp. 207-231). Research suggests that road traffic within 4.7 miles of leks negatively influence male lek attendance (Connelly et al. 2004). Fences also may cause direct mortality through collisions, as the birds fly fast and low across the landscape, particularly during the breeding season. In addition, fence poles create predator perch sites and potential predator corridors along fences (particularly if a road is adjacent). Furthermore, fences may effectively cause habitat fragmentation, as GRSG may avoid habitat around the fences to escape predation (Braun 1998). The NRCS Sage-Grouse

Initiative includes incentives for private landowners to mark or remove fences that have been deemed high-risk for GRSG injury or mortality.

Infrastructure development contributes to fragmentation by decreasing connectivity between seasonal habitats, which could limit access to needed habitat resources during critical seasons. Fragmentation can result in isolation, which increases the potential for loss of local populations from stochastic events, such as disease or drought (Knick and Hanser 2011). In addition to reducing the land area available to support GRSG, habitat loss and fragmentation also increase opportunities for other disturbances. Development and land use changes increase the risk of threats to GRSG and their habitat from human traffic, wildfire, and spread of invasive plants.

Conditions in the Sub-region and in MZ II/VII. Infrastructure, such as ROWs and associated facilities and urbanization, is widespread throughout MZ II/VII. In some locations, infrastructure development has affected GRSG habitat. Development of roads, fences, and utility corridors has also contributed to habitat loss and fragmentation in portions of MZ II/VII. The best available estimates suggest about 25 percent of the MZ II/VII are within approximately 4 miles of urban development (Knick et al. 2011, p. 214). Impacts of infrastructure development in MZ IV are primarily related to highways, roads, power lines, and communication towers, with 90 percent of MZ II/VII within 4 miles of a road, 25 percent within 4 miles of a power line, and 5 percent within 4 miles of a communication tower (Knick et al. 2011, pp. 215-216).

Although not representative of all infrastructure ROWs, transmission lines greater than 115 kVs indirectly influence 60 percent of priority habitat and 63 percent of general habitat across MZ II/VII. Indirect effects are assumed to occur to a radius of 4 miles (Manier et al. 2013, p. 41). Approximately 50 percent of transmission lines in priority habitat and 45 percent in general habitat are on BLM-administered lands across GRSG habitats in MZ II/VII (Manier et al. 2013, p. 41). There is also a substantial contribution from private lands, where 42 percent of transmission lines in priority habitat and 47 percent in general habitat are located. In contrast, National Forest System lands contain 1 percent of transmission lines in priority habitat and 1 percent in general habitat. Therefore, actions on BLM-administered and private lands are likely to have the greatest potential to affect transmission line ROWs in GRSG habitat than other land management entities. Designating ROW exclusion and avoidance areas in PHMA and GHMA on BLM-administered and National Forest System lands could reduce the threat on these lands. However, in areas with scattered federal landownership, infrastructure may be routed around federal lands, often increasing its length and impact. ROW avoidance and exclusion areas on BLM-administered and National Forest System lands could increase this tendency.

Table 5.2 shows several ROW applications for transmission lines, pipelines, and fiber-optic lines in the sub-region, and new road projects are anticipated to support numerous planned energy developments in the Uintah area. One road-removal project in the Rich area would reduce fragmentation of GRSG habitat in this location. By managing ROW avoidance and exclusion areas, BLM and Forest Service would reduce or minimize impacts from infrastructure in habitat areas. Similar restrictions on state and private land and collocation or clustering of facilities would also reduce impacts from ROWs or roads.

Impact Analysis. **Table 5.32**, Acres of Rights-of-Way Designations in GRSG Habitat in MZ II/VII, lists the areas of ROW avoidance and exclusion in GRSG habitat by alternative.

Table 5.32
Acres of Rights-of-Way Designations in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open to Rights-of-Way				
Alternative A	916,000	92%	5,609,000	0%
Alternative B	100,000	25%	5,611,000	<1%
Alternative C	154,000	52%	5,609,000	0%
Alternative D	74,000	0%	5,940,000	6%
Alternative E	74,000	0%	5,964,000	6%
Proposed Plans	77,000	4%	5,954,000	6%
Right-of-Way Exclusion				
Alternative A	572,000	1%	671,000	0%
Alternative B	1,092,000	48%	678,000	<1%
Alternative C	1,386,000	59%	671,000	0%
Alternative D	569,000	1%	678,000	<1%
Alternative E	569,000	1%	678,000	<1%
Proposed Plans	564,000	1%	674,000	<1%
Right-of-Way Avoidance				
Alternative A	7,811,000	1%	3,127,000	0%
Alternative B	7,759,000	0%	3,469,000	10%
Alternative C	7,759,000	0%	3,127,000	0%
Alternative D	8,308,000	7%	3,141,000	<1%
Alternative E	8,303,000	7%	3,127,000	0%
Proposed Plans	8,336,000	7%	3,134,000	<1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within ROW designations in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

Alternative A would not restrict the siting of ROWs, though existing policy does recommend collocating ROWs when possible. This would result in limited benefits for GRSG and their habitat. Restrictions in Alternatives B and C would prevent ROWs from being located in PHMAs, while Alternatives D and E and the Proposed Plans would avoid siting in PHMAs/mapped GRSG habitat in SGMAs/core areas if possible, preserving management flexibility at the expense of localized habitat degradation. Management under Alternative B or C would benefit GRSG the most on public lands by preventing ROW routing through PHMA, but by preventing development on BLM-administered or National Forest System land, these alternatives have the potential to shift development onto adjacent private land. Depending on the pattern of land-ownership, ROW routing may be less direct on private land, which could result in more widespread loss or fragmentation of GRSG habitat. Alternatives D and E and the Proposed Plans would also improve policy compared with Alternative A by siting ROW infrastructure such that it minimizes loss and fragmentation of habitat, predation risk, and other threats in PHMA, and preserves management flexibility in areas of mixed public-private ownership, where siting on federal land would minimize overall impacts on GRSG habitat versus siting only on private lands.

Across all alternatives, state and local efforts would continue to address the threat of fragmentation and isolation from infrastructure through a mix of voluntary and regulatory mechanisms. Threat alleviation would likely be greatest in Wyoming, where the state conservation strategy provides more regulatory avenues for implementation than in Utah. In addition, many of the proposed projects listed in **Section 5.4.8** would contribute to alleviating fragmentation through habitat-restoration projects aimed at restoring connectivity.

No new roadway projects are envisioned in the sub-region, though the new mines and oil and gas wells typically require access roads. Given the numbers of wells anticipated, a number of new access roads will likely be constructed in the short- and long term. The alternatives do not vary the acreage of habitat restricted to existing roads; however, the restrictions on locating fluid mineral development in primary habitat under Alternatives B and C may limit development of well access roads in GRSG habitat. Thus, these alternatives may be more protective of GRSG populations from impacts associated with roads on BLM-administered and National Forest System land. Alternatives B, C, and D, and the Proposed Plans would site planned transmission lines such that impacts on GRSG habitat are minimized, which would also reduce impacts and would allow management flexibility to minimize habitat loss on both public and private lands from road siting. Transmission lines already in progress, such as TransWest Express, however, would not be impacted by the management in the alternatives. Cumulative effects of the TransWest Express transmission line project would be similar to those described in **Section 5.4.4**.

New ROW authorizations that require state agency review or approval would be subject to the permitting process and stipulations for development in SGMAs under the Utah executive order. These stipulations would benefit the GRSG in these areas by restricting development in a manner that reduces additional habitat fragmentation and/or lek disturbance.

The effect of the alternatives and other conservation actions in the MZ (most notably the Utah and Wyoming executive orders) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. By implementing restrictions on infrastructure in PHMA and on state and private lands together, the cumulative beneficial effect on GRSG would be greater than the sum of their individual effects because protections would be applied more consistently across the landscape. This is especially important in areas of mixed land ownership patterns where complementary protections can benefit leks, early brood rearing habitat, or other important areas that do not follow geopolitical boundaries.

Reasonably foreseeable ROW development in MZ II/VII is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by restricting the type and location of developments. When restrictions in the Utah Greater Sage-Grouse LUPA are added to these conservation actions, the impacts of future ROW developments would be further reduced. The Proposed Plans would provide the greatest net conservation gain to GRSG habitats and populations in MZ II/VII by providing the flexibility to site ROWs with the least impact on GRSG habitat.

Renewable Energy

Nature and Type of Effects. Renewable energy facilities, including wind power, typically require many of the same features for construction and operation as do nonrenewable energy resources. LeBeau (2012) found decreased GRSG nest success and chick survival related to proximity to wind development infrastructure, Impacts from direct habitat losses, habitat fragmentation through roads and power lines, noise, and increased human presence would generally be similar to those for nonrenewable energy development (USFWS 2010, pp. 39-43).

Conditions in the Sub-region and in MZ II/VII. While most federal lands do not currently have a ROW grant or are developed for wind or solar energy, the areas of potential development coincide closely with GRSG habitats, especially in MZ II/VII (Manier et al. 2013, p. 60). There is currently no utility-scale wind energy development within occupied GRSG habitat in Utah. However, high wind potential exists on occupied GRSG habitat within the Rich Population Area.

Although not representative of all renewable energy development, wind turbines on BLM-administered land indirectly influence less than 1 percent of priority habitat and general habitat combined across MZ II/VII. Private lands account for 70 percent of wind turbines affecting GRSG in priority habitat (and 73 percent in general habitat) within MZ II/VII (Manier et al. 2013, p. 61). Therefore, conservation actions on private land are likely to have a greater potential to ameliorate the effects of wind energy development on GRSG habitat than any other single land management entity.

Impact Analysis **Table 5.33**, Acres of Wind Energy Management Designations in GRSG Habitat in MZ II/VII, displays acres open to wind energy ROW and wind energy exclusion and avoidance areas by alternative.

In the Utah Sub-region, all action alternatives would increase wind ROW exclusion acres in PHMA, with ROW exclusion acres highest under Alternative C, which would reduce potential impacts on GRSG on BLM-administered and National Forest System lands the most by eliminating future habitat fragmentation and disturbance from wind energy ROWs.

The no action alternative would manage the most GRSG habitat as open to wind ROWs, and would thereby have the greatest potential adverse impact on GRSG and their habitat. Alternative D would designate PHMA as ROW exclusion for utility-scale wind projects, and as such would provide protection from impacts of larger developments. Alternative E would not exclude these projects in GRSG habitats, but they would be avoidance areas. This would allow flexibility to place wind energy ROWs in areas where they may have less disturbance on leks or key GRSG habitat.

The Proposed Plans would manage PHMA and GHMA as exclusion for utility-scale solar facilities, and PHMA as exclusion for commercial wind facilities (see below). GHMA would be ROW avoidance for wind facilities. Wind developments would also be subject to the anthropogenic disturbance criteria, a three percent disturbance cap and 1 facility per 640 acre density cap, RDFs, buffers, and a mitigation requirement. This would allow strategic placement of renewable energy facilities either outside of GRSG habitat or, if located within GRSG habitat,

Table 5.33
Acres of Wind Energy Management Designations in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open to Wind Rights-of-Way				
Alternative A	841,000	100%	5,118,000	0%
Alternative B	25,000	100%	5,120,000	<1%
Alternative C	80,000	100%	5,118,000	0%
Alternative D	0	0%	5,441,000	6%
Alternative E	0	0%	5,473,000	6%
Proposed Plans	0	0%	5,461,000	6%
Wind Right-of-Way Exclusion				
Alternative A	3,244,000	<1%	955,000	0%
Alternative B	3,765,000	14%	958,000	<1%
Alternative C	4,058,000	20%	955,000	0%
Alternative D	3,790,000	15%	972,000	2%
Alternative E	3,241,000	0%	958,000	<1%
Proposed Plans	3,796,000	15%	958,000	<1%
Wind Right-of-Way Avoidance				
Alternative A	5,211,000	1%	3,323,000	0%
Alternative B	5,159,000	0%	3,665,000	9%
Alternative C	5,159,000	0%	3,323,000	0%
Alternative D	5,159,000	0%	3,331,000	<1%
Alternative E	5,703,000	10%	3,323,000	0%
Proposed Plans	5,184,000	<1%	3,323,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within wind energy management designations in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

in a manner that minimizes impacts both during the short-term (i.e., construction) and long-term (i.e., operation). As a result, the Proposed Plans would reduce potential impacts on GRSG relative to the No Action alternative and other action alternatives.

Projects that require state agency review or approval would be subject to the Utah and Wyoming executive order permitting processes. This would encourage wind energy development outside of SGMAs and Core Areas. Reasonably foreseeable renewable energy development in MZ II/VII is expected to increase over the 20-year analysis period (**Section 5.4.8**), though state GRSG conservation efforts as well as wind energy restrictions in other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by restricting the location of developments. When restrictions in the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Grazing/Free-Roaming Equids

Nature and Type of Effects. If not managed properly, cattle and sheep grazing can compact soil, enrich soil with nutrients, trample vegetation and nests, directly disturb GRSG and negatively

affect GRSG recruitment. Cattle and sheep also can reduce invertebrate prey for GRSG or increase their exposure to predators (Beck and Mitchell 2000, pp. 998-1,000; Knick 2011; Coates 2007, pp. 28-33). Grazing in riparian areas can destabilize streams and riverbanks, cause the loss of riparian shade, and increase sediment and nutrient loads in the aquatic ecosystem (George et al. 2011). However, grazing can reduce the spread of invasive grasses, and can be used to reduce fuel load (Connelly et al. 2004, p. 7, 28-30). Light to moderate grazing does not appear to affect perennial grasses, which are important to nest cover (Strand and Launchbaugh 2013).

Conditions in the Sub-region and in MZ II/VII. Livestock grazing is present and widespread on many land types, such as federal and private, across MZ II/VII. Rangeland health assessments have found that nearly 4 percent of BLM-administered grazing allotments in GRSG habitat in MZ II/VII are not meeting wildlife standards with grazing as a causal factor. Additionally, nearly 5 million acres of GRSG habitat within MZ II/VII, largely in southwest Wyoming, is federally managed wild horse and burro range (Manier et al. 2013, p. 131).

Impact Analysis. **Table 5.34**, Acres Available and Unavailable for Livestock Grazing in GRSG Habitat in MZ II/VII, lists the acres of PHMA and GHMA available and unavailable for grazing by alternative.

Table 5.34
Acres Available and Unavailable for Livestock Grazing in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		**General Habitat Management Areas**	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Available to Livestock Grazing				
Alternative A	9,764,000	9%	9,355,000	0%
Alternative B	8,901,000	0%	9,698,000	4%
Alternative C	8,901,000	0%	9,355,000	0%
Alternative D	8,901,000	0%	9,698,000	4%
Alternative E	8,901,000	0%	9,708,000	4%
Proposed Plans	8,901,000	6%	9,705,000	4%
Unavailable to Livestock Grazing				
Alternative A	30,000	90%	14,000	0%
Alternative B	21,000	86%	16,000	13%
Alternative C	894,000	100%	14,000	0%
Alternative D	3,000	0%	16,000	13%
Alternative E	28,000	89%	16,000	13%
Proposed Plans	28,000	89%	16,000	13%

Source: BLM 2015

Under Alternative A, grazing management would continue under current guidance, which includes construction of new range improvements detrimental to GRSG. Permit renewals and Rangeland Health evaluations would continue to help maintain rangeland vegetation, incidentally benefitting GRSG habitat. Under Alternative B, grazing acreages would be maintained but GRSG-specific habitat improvements would be incorporated into grazing management, reducing the

likelihood of impacts described above. Alternative D and the Proposed Plans would have impacts similar as Alternative B, but would include more specific management guidance designed to minimize impacts on GRSG populations and habitats. Under Alternative E, guidance for incorporating management changes in GRSG habitat could lead to limited improvement of GRSG habitat from grazing management. Under Alternative C, removing or greatly limiting livestock grazing in GRSG habitat areas would reduce the degradation of habitat from grazing in GRSG population areas, but it could result in the indirect impact of increasing grazing use on private lands if federal lands were unavailable. In addition, ranches which were unable to maintain economic viability in the absence of grazing privileges on federal land could be sold for development, resulting in permanent loss of GRSG habitat with potentially severe cumulative impacts on GRSG populations.

The COT report objectives for livestock grazing are to manage grazing in a manner consistent with local ecological conditions. This management would maintain or restore healthy sagebrush shrub and native perennial grass and forb communities and conserve essential habitat components for GRSG. Restoration to meet these standards and adequate monitoring would be required. The COT report also states that land managers should avoid or reduce the impact of range management structures on GRSG habitat.

Under the Proposed Plans, processing of grazing permits/leases and land health assessments would be prioritized in SFA followed by PHMA outside of SFA, which would lead to improved grazing management and lessened impacts on GRSG in the highest-quality habitat for the species.

Reasonably foreseeable livestock grazing management efforts in MZ II/VII are expected to increase over the analysis period (**Section 5.4.8**), through increased NRCS conservation actions under the Sage-Grouse Initiative (e.g., fence marking and conservation easements), state efforts to maintain ranchland, and the implementation of other BLM and Forest Service LUPAs in MZ II/VII. When grazing management within the Utah Greater Sage-Grouse LUPA is added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

For wild horses, the BLM and Forest Service have the ability under all alternatives to adjust AML if resource damage occurs. However, only Alternatives B through E and the Proposed Plans provide management guidelines specific to GRSG habitat (e.g., prioritizing gathers in GRSG habitat), which would benefit the species more than a continuation of current management under Alternative A. In addition, Alternative C (C1) would reduce AML by 25 percent, which would reduce habitat degradation from wild horses more than under any other alternative.

Reasonably foreseeable wild horse management efforts are projected to increase over the analysis period (**Section 5.4.8**) with implementation of other BLM and Forest Service LUPAs in MZ II/VII. Other past, present, and reasonably foreseeable future actions are unlikely to affect the threat from wild horses and burros, as these animals are federally managed. When wild horse management within the Utah Greater Sage-Grouse LUPA is added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII. Impacts may be reduced to the greatest extent under the Proposed Plans, where AMLs would be evaluated with consideration of GRSG habitat objectives for BLM-administered and National Forest System lands.

Spread of Weeds

Nature and Type of Effects. Invasive plant species alter plant community structure and composition, productivity, nutrient cycling, and hydrology. The invasive plants reduce and may eliminate vegetation that GRSG use for food and cover. Invasive plant species do not provide suitable GRSG habitat and by competitively excluding vegetation essential to GRSG, fragment existing GRSG habitat, and reduce habitat quality. In the portion of the Utah Sub-region located in MZ II/VII, the Uintah and Rich population areas are both threatened by habitat fragmentation.

Spread of invasive plant species, especially cheatgrass, threatens nearly all GRSG habitat and populations in Utah to some extent. Current estimates indicate more than 8 percent of priority habitat in and 11 percent of general habitat in the sub-region are at high risk of invasion, with notable risks remaining in some areas (Manier et al. 2013).

Conditions in the Sub-region and in MZ II/VII. Cheatgrass is distributed throughout MZ II/VII, though generally not with the same abundance observed in other WAFWA MZs, such as those in the Great Basin. Localized areas of MZ II/VII, such as southern Wyoming, are more thoroughly invaded by cheatgrass than cooler parts of the region (Manier et al. 2013, p. 131).

The BLM and Forest Service currently manage weed infestations through integrated weed management: biological, chemical, mechanical, manual, and educational methods. The BLM is guided by the 1991 and 2007 RODs for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991) and by the 2007 Programmatic Environmental Report (BLM 2007). Weeds are managed in cooperation with county governments in a landscape-level approach across management jurisdictions.

Impact Analysis. Increased activity, such as surface disturbance, motorized transportation, and animal and human activity, would increase the chance for the establishment and spread of invasive plants.

Under Alternative A, treatment of noxious weeds would continue under the current policy of integrated management. This would continue to benefit GRSG populations and habitats by implementing a coordinated approach across management jurisdictions. Under Alternatives B, C, D, and E, and the Proposed Plans, this coordinated approach would continue and treatments would focus on GRSG habitat. Although this increased management focus could benefit GRSG habitat, the actual change in the probability of invasive weed establishment would depend on the resources available to devote to the effort. As shown in **Section 5.4.8**, weed treatment and removal projects that would benefit GRSG habitat in the long term are ongoing or planned in the Vernal and Salt Lake BLM field offices, as well as the Uinta-Wasatch-Cache and Ashley National Forests. Overall, methods, approaches, and resources for weed control would be similar under all alternatives.

To the extent that the BLM and Forest Service reduce human disturbance from road building, ROW construction, and livestock grazing in habitat areas, these actions would likely reduce the spread of weeds into new areas. Alternatives B and C are most restrictive of new roads and infrastructure projects on BLM-administered and National Forest System lands. State and local plans to restore habitat would also reduce weeds in GRSG habitat, though human and livestock disturbance of private lands would likely continue.

The Proposed Plans would likely have the lowest potential for invasive weed spread and establishment, given the three percent anthropogenic disturbance threshold, adaptive management strategy that incorporates GRSG habitat triggers, extensive mitigation and monitoring plans, and wildfire and invasive species assessments and subsequent prioritization. The COT report objective for invasive species is to maintain and restore healthy native sagebrush plant communities.

Invasive species on BLM-administered and National Forest System lands would be controlled under all alternatives and may be more successful given the lower extent of invasion within the MZs. This would provide a net conservation gain to GRSG by restoring degraded sagebrush habitat.

Relevant cumulative actions that result in surface-disturbing activities would increase the potential for the spread of invasive weeds on both federal and non-federal lands. Projects subject to the general stipulations outlined in the Utah and Wyoming executive orders are required to control noxious and invasive weed species and to use native seed mixes during reclamation processes. These stipulations would benefit SGMAs and GRSG core habitat areas by limiting the spread or establishment of invasive species, particularly on lands that lack BLM and Forest Service protective regulatory mechanisms.

Reasonably foreseeable weed management efforts are projected to increase (**Section 5.4.8**), including other state and county noxious weed regulations and the implementation of other BLM and Forest Service LUPAs in MZ II/VII. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII. The Proposed Plans may result in the greatest net conservation gain due to its three percent anthropogenic disturbance cap that should reduce potential for the spread of weeds during the 20-year analysis period.

Conversion to Agriculture

Nature and Type of Effects. The impacts of conversion to agriculture on GRSG are described above in **Section 5.4.4**.

Conditions in the Sub-region and in MZ II/VII. Regional assessments estimate that while only 1 percent of priority and general habitat in MZ II/VII are directly influenced by agricultural development, over 80 percent of these habitats are within approximately 4 miles of agricultural land (Manier et al. 2013, p. 27).

Impact Analysis. The BLM and Forest Service do not convert public lands to agriculture. As such, the only direct authority these agencies have over conversion to agriculture is by retaining or disposing of lands in the realty program. Lands retained under BLM and Forest Service management will not be converted to agriculture and disposing of lands could increase the likelihood they will be converted to agriculture, depending on their location and new management authority.

As shown below in **Table 5.35**, Acres Identified for Retention and Disposal in GRSG Habitat in MZ II/VII, these acreages vary little in the sub-region or in MZ II/VII among the alternatives.

Table 5.35
Acres Identified for Retention and Disposal in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Acres Identified for Retention				
Alternative A	6,716,000	0%	8,572,000	0%
Alternative B	6,735,000	<1%	8,592,000	<1%
Alternative C	6,757,000	1%	8,572,000	0%
Alternative D	6,735,000	<1%	8,572,000	0%
Alternative E	6,716,000	0%	8,572,000	0%
Proposed Plans	7,301,000	8%	8,928,000	4%
Acres Identified for Disposal				
Alternative A	41,000	39%	156,000	0%
Alternative B	24,000	0%	157,000	1%
Alternative C	24,000	0%	156,000	0%
Alternative D	24,000	0%	157,000	1%
Alternative E	39,000	38%	157,000	1%
Proposed Plans	24,000	0%	156,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA identified for retention and disposal in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

Under Alternatives B, C, and D, and the Proposed Plans, the BLM and Forest Service would generally retain GRSG habitat, thereby eliminating the possibility that GRSG habitat would be converted to agriculture use. Alternatives A and E do not specify retention of GRSG habitat, and thus there is the possibility of these lands being disposed.

Lands identified for disposal in MZ II/VII are typically small isolated parcels that are difficult to manage and do not represent suitable GRSG habitat. Parcels determined to have GRSG habitat value would not likely meet the disposal criteria, unless disposal were seen to have a net conservation gain.

Cumulative impacts vary relatively little across alternatives, and BLM and Forest Service management may have little impact on alleviating this threat. Restrictions on grazing on federal land could increase agriculture pressure on adjacent private lands. If the loss of federal grazing privileges makes ranching economically unviable, the potential conversion of private grazing lands to agriculture would increase. However, the Proposed Plans do not substantially increase acreage unavailable to grazing. Alternative C includes 15 new ACECs and Zoological Areas for protection of GRSG, which would be retained under BLM and Forest Service management and thus would not be converted to other uses such as agriculture or urbanization.

The COT report objectives for converting land to agriculture are to avoid further loss of sagebrush habitat for agricultural activities (both plant and animal production) and to prioritize restoration. In areas where taking agricultural lands out of production has benefited GRSG, the programs supporting these actions should be targeted and continued (USFWS 2013a, p. 48). In

accordance with this objective, the NRCS Sage-Grouse Initiative focuses on maintaining ranchland that provides habitat for GRSG. As a result, private land containing GRSG habitat is protected from conversion to agriculture or other development for the life of the conservation agreement. The conservation easements and other conservation incentives, such as restoration of water features and fence marking, can enhance the ability of private ranchlands to support GRSG.

Additional actions within the sub-region include agricultural restoration or modification for benefit of GRSG, including establishing upland brood rearing habitat, or "brood strips." Upland brood strips are areas established to maximize insect and forb production for young gallinaceous birds including GRSG. These areas are planted to both native and introduced legumes and other preferred forbs in linear or sinuous strips at the edges of existing cropland, hayland, and pastureland (Danvir 2002).

Over the analysis period, conversion to agriculture is expected to increase (**Section 5.4.8**), though state and private conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat. When land tenure decisions within the Utah LUPA are added to these conservation actions, this would result in net conservation gain to GRSG habitats and populations in MZ II/VII.

Wildfire

Nature and Type of Effects. The impacts of fire on GRSG are described above in **Section 5.4.4**.

Conditions in the Sub-region and in MZ II/VII. Fire risk is generally low across MZ II/VII, though areas in the northern and southern portions of the MZs have a higher fire risk (Manier et al. 2013, p. 131). Within the MZs, 10 percent of priority and general habitat have a high risk for fire (Manier et al. 2013, p. 85).

Impact Analysis. Management actions in the Utah Sub-region that emphasize wildfire suppression in GRSG habitat would benefit the species by limiting habitat loss in the event of wildfire. Under current management (Alternative A), prescribed burning may be used to achieve habitat objectives; most existing LUPs support objectives of re-introducing fire into fire-dependent ecosystems and prioritizing response to wildfires and determining where fire can be used for resource benefit. Alternatives B, C and E would set limits on the use of prescribed fire, while Alternative D and the Proposed Plans would allow its use if other treatment methods were not effective. The action alternatives all prioritize sagebrush protection in fuels treatment programs and would provide superior protection for sagebrush in prescribed burning, fuels treatment and fire suppression. The Proposed Plans would further reduce impacts from wildland fire by conducting the wildland fire and invasive species assessments and subsequent prioritization of the landscape according to the FIAT report. This management is in accordance with the COT report objective to retain and restore healthy native sagebrush plant communities within the range of GRSG.

Recognition of the importance of sagebrush habitat during interagency wildfire response would benefit GRSG in the event of an unplanned fire. The Wyoming and Utah executive orders emphasize fire suppression in GRSG habitat, while recognizing other suppression priorities may

take precedent. This would benefit GRSG during wildfire planning and response, particularly on lands not administered by the BLM or Forest Service.

The Interagency Standards for Fire and Fire Aviation Operations "Red Book" includes a BMP for GRSG habitat conservation for wildlife and fuels management (BLM 2013b). This document is a supplemental policy or guidance for the BLM, the Forest Service, and the USFWS. This BMP would benefit the GRSG during interagency wildland fire operations. It would do this by using spatial habitat data and predictive services to prioritize and preposition firefighting resources in critical habitat areas. Coordination with rural fire districts to manage wildfires in GRSG habitat will further reduce this threat across land ownership types and improve the quality and quantity of habitat.

Reasonably foreseeable wildland fire management efforts are projected to increase (**Section 5.4.8**), especially through increased coordination of federal, state, and local fire prevention actions and the implementation of other BLM and Forest Service LUPAs in MZ II/VII. When the impacts of the Utah LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Recreation

Nature and Type of Effects. The impacts of recreation on GRSG are described in **Section 5.4.4**.

Conditions in the Sub-region and in MZ II/VII. Human populations have increased and expanded, primarily over the past century and in the western portion of the sagebrush distribution. Within MZ II/VII, population densities have increased 31 percent on the Colorado Plateau and 19 percent in the Wyoming Basin (Knick et al. 2011, p. 212). With these expanding populations come greater human impacts (Leu et al. 2008).

The COT report objectives for recreation are to maintain healthy native sagebrush communities, based on local ecological conditions, and to manage direct and indirect human disturbance (including noise) to avoid interruption of normal GRSG behavior (USFWS 2013a, p. 49). Limits on road use under the action alternatives and limits on OHVs would help meet these objectives.

Impact Analysis. **Table 5.36**, Acres of Travel Management Designations in GRSG Habitat in MZ II/VII, shows acres of travel management designations in GRSG habitat in MZ II/VII.

As shown in **Table 5.36**, Alternatives C would close the most acres of PHMA, and only Alternatives A and E would leave acreage in PHMA open to new routes. In conjunction with the Proposed Plans elsewhere in MZ II/VII, all Utah Sub-region alternatives would manage most acres in PHMA as limited to existing routes. Alternative E2 applies to National Forest System lands in the Wyoming portion of the Utah Sub-region, where all lands are limited to existing routes under current management. Limiting travel to existing routes minimizes potential habitat fragmentation and disturbance to GRSG from off-road travel. Because of travel management planning, impacts on GRSG from recreational motorized vehicle use would be greatest under Alternative A because more acres would be open for cross-country travel and the attendant

Table 5.36
Acres of Travel Management Designations in GRSG Habitat in MZ II/VII

	Priority Habitat Management Areas		General Habitat Management Areas	
	MZ II/VII	***Percent within Sub-region***	**MZ II/VII**	***Percent within Sub-region***
Open				
Alternative A	73,000	95%	58,000	0%
Alternative B	4,000	0%	58,000	0%
Alternative C	4,000	0%	58,000	0%
Alternative D	4,000	0%	58,000	0%
Alternative E	18,000	78%	58,000	0%
Proposed Plans	5,000	8%	58,000	0%
Limited				
Alternative A	8,920,000	7%	8,978,000	0%
Alternative B	8,708,000	5%	9,261,000	3%
Alternative C	8,806,000	6%	8,978,000	0%
Alternative D	8,708,000	5%	9,261,000	3%
Alternative E	8,688,000	5%	9,269,000	3%
Proposed Plans	8,861,000	7%	9,331,000	4%
Closed				
Alternative A	115,000	10%	363,000	0%
Alternative B	111,000	7%	366,000	1%
Alternative C	301,000	66%	363,000	0%
Alternative D	111,000	7%	366,000	1%
Alternative E	111,000	7%	366,000	1%
Proposed Plans	112,000	7%	366,000	1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within travel management designations of open, limited and closed in MZ II/VII; it also displays the percentage of those acres that are found within the sub-region.

increased possibility of habitat fragmentation, habitat degradation, and mortality from collisions with vehicles. Impacts would be reduced most under Alternatives C and D and the Proposed Plans because fewer acres would be open for cross-country management and future route designations would prioritize minimizing impacts on GRSG populations and habitats.

The COT report objectives for recreation are to maintain healthy native sagebrush communities, based on local ecological conditions, and to manage direct and indirect human disturbance (including noise) to avoid interruption of normal GRSG behavior (USFWS 2013a, p. 49). Limits on road use under the action alternatives and limits on OHVs would help meet these objectives.

Reasonably foreseeable recreation in MZ II/VII is expected to increase over the 20-year analysis period (**Section 5.4.8**). However, state and private GRSG conservation efforts as well as other BLM and Forest Service Proposed Plans in MZ II/VII would reduce the threat by providing additional protections such as disturbance caps and limitations on National Forest System lands.

When restrictions within the Utah LUPA are added to these conservation actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII.

Conifer Encroachment

Nature and Type of Effects. Conifer woodlands, especially juniper (*Juniperus* spp.) and in some regions pinyon pine (*Pinus edulis*), may expand into sagebrush habitat and reduce availability of habitat for GRSG. Conifer expansion may be encouraged by human activities, including fire suppression and grazing (Miller et al. 2011). If woodland development is sufficient to restrict shrub and herbaceous understory growth, habitat quality for GRSG will be reduced (Connelly et al. 2004). Mature trees offer perch sites for raptors; thus, woodland expansion may also increase the threat of predation, as with power lines (Manier et al. 2013). Locations within approximately 1,000 yards of current pinyon-juniper woodlands are at highest risk of expansion (Bradley 2010). The greatest risks from conifer encroachment are thought to be in the Great Basin, with smaller risks (6 to 7 percent of priority and general habitat) in the Wyoming Basin (Connelly et al. 2004; Manier et al. 2013). Studies have shown that GRSG incur population-level impacts at very low levels of conifer encroachment (Baruch-Mordo et al. 2013).

Conditions in MZs II/VII. Approximately 46 percent of conifer encroachment risk in priority habitat (and 43 percent in general habitat) occur on BLM-administered lands within MZs II/VII (Manier et al. 2013). Therefore, BLM actions are likely to have a greater potential to ameliorate the effects of conifer encroachment on GRSG than any other single land management entity.

Impact Analysis. Specific RDFs common to all BLM and Forest Service plans in MZs II/VII include removal of standing and encroaching trees within 100 meters of occupied leks and other habitats (e.g., nesting, wintering, and brood rearing). Additionally, reintroduction of appropriate fire regimes would limit conifer encroachment into the sagebrush plant communities. These actions would benefit GRSG by improving the quality of habitat throughout the MZ.

Additionally, under the Proposed Plans, conifer removal treatments would be prioritized closest to occupied GRSG habitats and near occupied leks, and where juniper encroachment is phase 1 or phase 2. This action would benefit GRSG by improving the quality of habitat and functionality.

In Colorado, the Colorado Parks and Wildlife has conducted conifer treatments totaling 2,600 acres (Colorado Department of Natural Resources 2013). In addition, the Sage-Grouse Initiative has helped reduce the threat of early succession conifer encroachment through mechanical removal on 10,500 acres of private lands within MZs II/VII. The majority of these efforts were located inside PACs (NRCS 2015), helping to preserve historic fire return intervals and important GRSG habitat.

Reasonably foreseeable conifer encroachment management efforts are projected to increase (**Section 5.4.8**), including efforts on private land and implementation of other BLM and Forest Service LUPAs in MZ II/VII. When the impacts of the Utah Greater Sage-Grouse LUPA are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ II/VII. The Proposed Plans would have the greatest reduction in the threat from conifer encroachment and provide a net conservation gain to GRSG.

5.4.7 Conclusion

In addition to BLM and Forest Service management in the Utah Sub-region and other planning areas and sub-regions in MZs III, IV, and II/VII, GRSG in these MZs will also be impacted by management and conservation at state, regional, tribal, and local levels. This analysis takes into account each alternative in the Utah LUPA/EIS in conjunction with state and private initiatives, as well as past, present, and reasonably foreseeable future actions at the federal, state, and local levels. The analysis assumes that the Proposed Plans would be implemented in the other BLM and Forest Service GRSG planning areas and sub-regions in MZs III, IV, and II/VII.

Some of the most important past and present actions benefitting GRSG populations on private land in MZ III, IV, and II/VII are the conservation easements coordinated by the NRCS Sage-Grouse Initiative with private ranchers. The Sage-Grouse Initiative has also worked with landowners to improve grazing regimens, increase fence marking, seeding of native vegetation, and conifer removal to improve GRSG habitat quality. Future coordination of private landowners with the Sage-Grouse Initiative is expected to provide further benefits to GRSG habitat.

This coordination with private landowners enhances conservation in addition to what BLM and Forest Service management can accomplish on federal lands. Ranchers in Wyoming and Montana are also using Candidate Conservation Agreement with Assurances with the USFWS. Under these instruments, the ranchers voluntarily agree to manage lands to reduce threats to GRSG in exchange for a guarantee that they will not be subject to additional regulations should the species become listed.

As discussed in **Section 5.4.3**, Regional Efforts to Conserve Greater Sage-Grouse, several states in the GRSG range have adopted statewide plans to promote GRSG conservation, including Utah, Wyoming, and Montana. The plans implement a Core Population Area Strategy with well density limits, timing restrictions, and a 5 percent disturbance cap across all landownership types. These measures, if effectively enforced, would improve GRSG numbers and allow recovery of populations (Copeland et al. 2013), primarily in MZ II/VII, where most of GRSG habitat, regardless of landownerships is covered by these restrictions. The limitations on timing and density of energy development along with the disturbance cap, and BLM and Forest Service management on lands with federal mineral estate, would act in concert to promote GRSG conservation and reduce the impacts from energy development on leks, breeding habitat, and wintering habitat. However, other states (such as Idaho, Colorado, Nevada, and Oregon) do not have similar executive orders in place. These states have GRSG conservation plans that generally include voluntary guidelines, not regulatory mechanisms. This could allow for more impacts on the percentage of GRSG habitat that is state- or privately-owned. However, Nevada does have an avoid, minimize, and mitigate strategy, as well as the conservation credit system to help reduce impacts.

BLM and Forest Service restrictions on ROWs/SUAs, renewable energy, and energy development in GRSG habitat would help reduce loss and disturbance of GRSG populations. The Proposed Plans include numerous measures to allow development while reducing the likelihood for impacts on GRSG, such as requirements for anthropogenic disturbance criteria, a 3 percent disturbance cap and 1 facility per 640 acre density cap, buffers, mitigation, and RDFs.

The more challenging threats to manage in the Great Basin are fire, the spread of weeds, and conifer encroachment. Fire regimes are complex and vary tremendously across the sagebrush region and through time. Fire is exacerbated by invasive weeds, particularly in Wyoming big sagebrush types, where the invasion by exotic annuals has resulted in dramatic increases in number and frequency of fires with widespread, detrimental effects on habitat conditions (Manier et al. 2013, p. 88). Expansion of conifer woodlands, especially juniper (*Juniperus* spp.) removes suitable habitat for GRSG, by increasing predation and displacement of shrubs, grasses, and forbs by mature trees (Manier et al. 2013, p. 91). These threats, along with the spread of West Nile virus, are at the landscape scale and many are extensive throughout MZ III and IV; the Proposed Plans include comprehensive strategies to address these threats but it is unclear if management will be effective in containing them.

Reasonably foreseeable future actions in MZs III, IV, and II/VII such as proposed interstate transmission lines (with the exception of TransWest Express), wind energy projects, geothermal development, vegetation management, oil and gas development, and other land disturbance would be subject to the requirements set forth in the BLM and Forest Service Proposed Plans which encompass the MZs, where those projects occur on federal decision area lands. For non-federal lands, reasonably foreseeable future projects may be subject to measures of GRSG state plans, as well as site-specific mitigation and disturbance caps.

Alternative A

Current management does consider wildlife habitat value in decision-making, which provides limited protection for GRSG. State sagebrush protection and restoration efforts to restore habitat, improve rangeland, and establish or improve linkages between habitat areas, in collaboration with private landowners, oil and gas leaseholders, and federal and state agencies, would continue. As a result, the greatest amelioration of threats would be most likely to occur on private and state lands. Even with implementation of BLM and Forest Service Proposed Plans in other RMPAs/LUPAs, there would be less amelioration of major threats in MZs II/VII, III, and IV than under other alternatives, especially on federal lands in the Utah Sub-region. Within the Utah Sub-region, there would continue to be no designated PHMA/mapped GRSG habitat in SGMAs/core areas or GHMA/mapped GRSG habitat outside SGMAs/noncore areas, no new ROW avoidance or exclusion areas established, and no new areas closed or restricted to fluid mineral leasing. These are all important conservation measures that complement restrictions on adjacent lands and can help provide a landscape-scale net conservation gain to GRSG populations and habitats. Planned transmission lines and ROWs across federal, state, and private land in the Utah Sub-region would increase fragmentation of GRSG habitat, and a substantial number of drilling pads and mines are planned on existing leases on BLM-administered and National Forest System lands, which would increase loss of habitat and disturbance of GRSG populations. Similar development in association with new leases is also possible and impacts would be similar. Voluntary protections would continue to be implemented on private land (e.g., NRCS Sage-Grouse Initiative) and in Utah and Colorado, as well as regulation-based protections in Wyoming. Overall, the limited number and extent of regulatory mechanisms under Alternative A would result in continued degradation of habitat from the major threats in MZs III, IV and II/VII and would not meet the COT report objectives for conservation of GRSG within Utah, though COT objectives would likely be met elsewhere in the MZs where Proposed Plans are implemented.

Alternative B

Under Alternative B, the BLM and Forest Service would implement a number of protections for GRSG in the Utah Sub-region, including designating PHMA and GHMA and new ROW exclusion and avoidance areas, as well as incorporation of RDFs to reduce impacts of projects. Habitat would be protected by NSO stipulations or closure to fluid mineral leasing. Land disposals and acquisitions would focus on maintaining sagebrush acreage and connectivity. Alternative B would site transmission lines to minimize impacts on GRSG, and would close PHMA to fluid mineral leasing, likely reducing the number of planned wells and acres of habitat disturbed by energy development, compared with Alternative A. These restrictions may dissuade developers from siting projects on BLM-administered and National Forest System lands and push development onto state or private lands with less ability to minimize impacts on GRSG. Alternative B would be sufficient to reduce threats on BLM-administered and National Forest System lands in the Utah Sub-region; success on a cumulative scale would be achievable only if voluntary programs, local working groups, and state plans are consistently implemented and/or enforced. Proposed Plans in other BLM and Forest Service RMPAs/LUPAs throughout MZs II/VII, III, and IV would be implemented, which would complement conservation efforts on other lands in those areas and help achieve COT report objectives for energy development, infrastructure, recreation, fire, invasives, and grazing in those portions of the MZs.

In combination with other past, present, and reasonably foreseeable future actions, Alternative B would likely meet the objectives in the COT report for infrastructure, grazing/free-roaming equids, conversion to agriculture, energy development, and recreation. Without a comprehensive strategy to address fire, invasive plants, and conifer encroachment, it may not meet the COT objectives for these major threats.

Alternative C

Alternative C would provide more protection to GRSG on BLM-administered and National Forest System land in MZs II/VII, III, and IV than any other alternative. However, strong restrictions in Alternative C may push development onto private or state lands with less stringent protections for GRSG. For example, under Alternative C, ACECs and Zoological Areas would be established on PHMA administered by the BLM and Forest Service, respectively, and habitat areas would be closed to fluid mineral leasing, dramatically reducing the amount of development allowed within GRSG habitat on BLM-administered and National Forest System lands. Grazing would also be reduced in GRSG habitat (Alternative C2) or eliminated entirely (Alternative C1). These policies would provide the most protection for GRSG habitat from loss and fragmentation and limit human disturbance; they would also place the greatest onus on other landowners to similarly restrict development (or redirect development away from GRSG habitat) to more fully reduce the major threats. Indirect effects from Alternative C may prove harmful to GRSG, fuels buildup increases fire risk, or additional fencing is required. Ultimately, if ranches become uneconomical due to loss of federal grazing privileges, GRSG habitat could be lost from subdivision or agricultural conversion.

Proposed Plans in other BLM and Forest Service RMPAs/LUPAs throughout MZs II/VII, III, and IV would be implemented, which would complement conservation efforts on other lands in those areas and help achieve COT objectives for energy development, infrastructure, fire, invasives, and recreation in those portions of the MZs. Together with other past, present, and

reasonably foreseeable future actions, Alternative C would likely meet the objectives in the COT report for infrastructure, conversion to agriculture, energy development, and recreation. Without a comprehensive strategy to address fire, invasive plants, and conifer encroachment, it may not meet the COT objectives for these threats. Further, it is unknown whether removal of grazing would meet the COT objectives for range management.

Alternative D

Alternative D would improve GRSG habitat protection over current management, but with less stringent restrictions than Alternatives B or C. For example, Alternative D would not close habitat to fluid mineral leasing and would rely on NSO, CSU, or TL stipulations to minimize disturbance of GRSG. It would preclude development of facilities in areas where research has shown GRSG populations are sensitive to development; however, this provision may prove ineffective, as development could still occur in areas lacking documentation of adverse impacts on GRSG. Similarly, Alternative D would establish ROW avoidance areas, rather than exclusion areas, throughout PHMA, and would exclude all aboveground types of ROWs within 1 mile of a lek, and within 4 miles for aboveground linear ROWs. These provisions could allow for limited development in the decision area while providing protection to the GRSG habitats most sensitive to the types of ROWs with the greatest potential to affect GRSG populations. Additionally, allowing limited development within GRSG habitat in the decision area could alleviate development pressures on other lands, especially in concert with the State of Utah's *Conservation Plan for Sage-grouse in Utah*, as well as the Wyoming GRSG Executive Orders, which could increase the effectiveness of management under this alternative.

Proposed Plans in other BLM and Forest Service RMPAs/LUPAs throughout MZs II/VII, III, and IV would be implemented, which would complement conservation efforts on other lands in those areas and help achieve COT objectives for energy development, infrastructure, recreation, grazing, fire, and invasives, in those portions of the MZs. In conjunction with state and regional planning efforts, implementation of state measures, conservation easements on private lands, implementation of other BLM and Forest Service LUPAs in MZs III, IV, and II/VII, and other past, present, and reasonably foreseeable future actions, Alternative D would likely meet the objectives laid out in the COT report for fire, infrastructure, grazing/free-roaming equids, conversion to agriculture, energy development, and recreation, invasive plants and conifer encroachment.

Alternative E

Alternative E is based on the Utah and Wyoming state plans. It would improve GRSG habitat protection over current management, but with less stringent restrictions than Alternatives B, C, or D. Alternative E would leave some habitat open to fluid mineral leasing without stipulations, and would rely on NSO, CSU, or TL stipulations for the majority of habitat. Similarly, it would establish ROW avoidance areas, but not ROW exclusion areas. New disturbances within SGMAs would be limited by a 5 percent disturbance cap, and impacts on GRSG would be avoided. When avoidance is not possible, minimization measures and mitigation would be required at a 4-to-1 ratio. These provisions would allow for some development in the decision area, which could reduce pressures on state and private lands, but also provides less protection to GRSG populations than the other action alternatives.

Proposed Plans in other BLM and Forest Service RMPAs/LUPAs throughout MZs II/VII, III, and IV would be implemented, which would complement conservation efforts on other lands in those areas and help achieve COT objectives for energy development, infrastructure, recreation, fire, invasives, and grazing in those portions of the MZs. In conjunction with state and regional planning efforts, implementation of state measures, conservation easements on private lands, implementation of other BLM and Forest Service LUPAs in MZs III, IV, and II/VII, and other past, present, and reasonably foreseeable future actions, Alternative E would likely meet the objectives laid out in the COT report for fire, grazing/free-roaming equids, conversion to agriculture, recreation, invasive plants and conifer encroachment. With less stringent restrictions on development, it might not meet the objectives for infrastructure or energy and mining.

The Proposed Plans

Under the Proposed Plans, the BLM and Forest Service would manage lands to conserve, enhance, and restore GRSG habitat and the sagebrush ecosystem upon which GRSG populations depend. The Proposed Plans are based on public comments received on the Draft LUPA/EIS, internal BLM and Forest Service review, new information, and best available science. Like Alternative D, the Proposed Plans would rely on NSO stipulations in PHMA and CSU and TL stipulations in GHMA to minimize disturbance of GRSG from energy development, and would establish ROW avoidance areas, rather than exclusion areas. In addition, the Proposed Plans would incorporate adaptive management, anthropogenic disturbance criteria, buffers, habitat objectives, monitoring, and mitigation for GRSG, as well as incorporation of RDFs to reduce impacts of projects. The Proposed Plans provide vegetation treatment acres by decade sufficient to meet desired habitat conditions (70 percent of the analysis area meeting 10 to 30 percent sagebrush cover) (NTT 2011). SFA would also be designated under the Proposed Plans and would prioritize renewal of grazing permits and recommend locatable minerals from withdrawal to the extent possible under the law. The Proposed Plans would provide a higher level of GRSG habitat protection compared to current management, while allowing flexibility for resource uses when there would be no harmful impacts on GRSG. The Proposed Plans would apply a 3 percent disturbance limit in PHMA on federal lands. In conjunction with state disturbance limits (in Utah, Montana, and Wyoming) that apply to all landownerships, these restrictions would provide protection to GRSG populations by limiting development and fragmentation in core habitat areas.

In conjunction with state and regional planning efforts, implementation of state conservation measures in GRSG core areas, conservation easements on private lands, implementation of other BLM and Forest Service LUPAs in MZs III, IV, and II/VII, and other past, present, and reasonably foreseeable future actions, the Proposed Plans would likely meet the objectives laid out in the COT report for fire, infrastructure, grazing/free-roaming equids, mining, energy development, conversion to agriculture, invasive plants, conifer encroachment, and recreation.

Summary

Overall, GRSG populations across MZs III, IV, and II/VII face the greatest pressures from wildfire, invasive plants, conifer encroachment, and energy development, including wind and geothermal, and infrastructure.

Threat reduction for fire is difficult and costly. Given the intensity and widespread distribution of the threat, it may never be fully eliminated (USFWS 2013a, p. 40), but the comprehensive strategies under the Proposed Plans may be able to reduce the threat considerably.

Energy development and mining is a major concern in MZ III and II/VII, with valid existing rights in place for projects within GRSG habitat. BLM and Forest Service will mitigate and avoid impacts from these projects to the maximum extent possible under the Proposed Plans. Future leasing will be subject to disturbance limits in core habitat areas, and particularly in SFA.

Infrastructure projects are of particular concern in GRSG habitat, because numerous multi-state transmission lines are proposed, as are utility-scale wind projects. Implementation of the BLM and Forest Service Proposed Plans is unlikely to preclude such projects, especially Presidential Priority transmission line projects that are not subject to GRSG protective measures in the BLM and Forest Service planning efforts.

The cumulative effect of reasonably foreseeable future infrastructure and energy development projects over the next 20 years, when combined with unplanned events such as wildfires, drought, and associated decline in GRSG habitat quality, could increase the likelihood of local population extirpation, particularly for the small, isolated, less robust populations that are considered at-risk. However, restrictions on land use in combination with project-specific RDFs and other regional efforts will help mitigate the effects of infrastructure and energy development.

Regardless of alternative, amelioration of the major threats in MZs III, and IV, and II/VII can be greatly enhanced by effective enforcement of regulations for conservation of GRSG. Because 51 percent of all GRSG habitat in MZ II/VII, 82 percent in MZ III, and 68 percent in MZ IV is federally administered, the relative ability of BLM and Forest Service actions to reduce the major threats—in terms of acres of habitat affected—would make a substantial contribution to cumulative effects on GRSG. Conservation actions in concert with actions taken by tribal, state, and local governments, and private landowners would improve effectiveness and may act synergistically in conserving GRSG populations. Implementation of the action alternatives would reduce major threats faced by GRSG in MZs III, and IV and II/VII to varying degrees. While all action alternatives contain restrictions sufficient to reduce threats on BLM-administered and National Forest System lands, Alternative B and, to a greater extent, Alternative C, may be so restrictive that they push future development onto state and private lands, thereby partially off-setting their beneficial effects on GRSG. Alternative C also restricts grazing, which may result in harmful indirect effects.

Under any alternative, despite BLM, Forest Service, state, and local actions, overall trends toward habitat loss are likely to continue from human disturbance, leading to spread of weeds, disease, and wildfire, and from ongoing infrastructure, energy, and development pressures in GRSG habitat. These threats may lead to continuing decline of GRSG, including loss of smaller and more isolated populations, but effective implementation of these plans and management across all landownerships in GRSG range would protect the core GRSG population areas within the sub-region and in MZ III, IV, and II/VII and maintain the viability of the species.

5.4.8 MZ-Wide Reasonably Foreseeable Future Actions Summary Tables

Table 5.37, Reasonably Foreseeable Future Actions in Management Zone II/VII Likely to Impact GRSG Habitat, through **Table 5.39**, Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat, include a selection of some of the larger projects from the reasonably foreseeable future actions tables in the RMPAs/LUPAs for MZs II/VII, III, and IV. The full tables can be found in each EIS within each MZ.

Table 5.37
Reasonably Foreseeable Future Actions in Management Zone II/VII Likely to Impact GRSG Habitat

MZ	Planning Area	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
Energy and Mining						
II/ VII	Northwest Colorado, 9-Plan	Wyoming Basin, Northwest Colorado	Hiawatha Regional Energy Development EIS	Sweetwater County, Wyoming; Moffat County, Colorado	Proposed development of up to 4,208 new natural gas wells on approximately 157,361 acres of mixed federal, state, and private lands. The project area overlaps with lands identified as GRSG Core Areas. 91% of the project area is managed by the BLM.[1]	Proposed
II/ VII	9-Plan	Wyoming Basin	LaBarge Platform Exploration & Development Project	Lincoln and Sublette County, Wyoming	Proposed development of up to 838 new oil and gas wells on 218,000 acres of private, state, and federal lands. Approximately 154,000 acres of surface lands are administered by the BLM.[2]	Proposed
II/ VII	9-Plan	Wyoming Basin	Continental Divide-Creston Natural Gas Project	Carbon and Sweetwater Counties, Wyoming	Proposed development of up to 8,950 additional natural gas wells on 1.1 million acres of land, including GRSG Core Areas. The proposed facilities would add to the existing network of wells, pipelines, access routes, and electrical distribution systems. Approximately 59 percent of the project area is on federally-owned lands.[3]	Proposed
II/ VII	Lander, 9-Plan	Wyoming Basin	Moneta Divide Natural Gas and Oil Development Project	Fremont and Natrona Counties, Wyoming	Proposed development of approximately 4,250 natural gas and oil wells on 265,000 acres of land (including approximately 169,500 acres of land administered by the BLM). The project area includes GRSG Core Areas.[4]	Proposed
II/ VII	9-Plan	Wyoming Basin	Pinedale Anticline Project	Sublette County, Wyoming	Proposed development of natural gas resources within nearly 200,000 acres of land,	Ongoing

Table 5.37
Reasonably Foreseeable Future Actions in Management Zone II/VII Likely to Impact GRSG Habitat

MZ	Planning Area	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
					of which approximately 80 percent is federal surface ownership. The project area occurs within GRSG Core Areas.[5]	
II/ VII	9-Plan	Wyoming Basin	Blacks Fork Project (Formerly Moxa Arch Area Infill)	Sweetwater, Uinta, and Lincoln Counties, Wyoming	Proposed infill drilling project, on approximately 7,500 hydrocarbon wells within 633,532 acres of mixed federal, state, and private lands.[6]	Proposed
II/ VII	9-Plan, Northwest Colorado, Utah	Wyoming Basin, Northwest Colorado	Oil Shale and Tar Sands Programmatic EIS	Colorado, Utah, and Wyoming	Amendment of 10 BLM RMPs to designate certain public lands as available for application for leasing and future exploration and development of oil shale and tar sands resources. A ROD was signed in 2013 which made approximately 678,000 acres available for potential development of soil shale, and approximately 132,000 acres available for development of tar sands.[7]	Ongoing
II/ VII	9-Plan	Wyoming Basin	Atlantic Rim Natural Gas Field Development Project	Carbon County, Wyoming	Ongoing development of oil gas resources on 270,080 acres of land, of which 173,672 are federal surface estate. A ROD was signed in 2007. The project area includes GRSG Core Areas.[8]	Ongoing
II/ VII	9-Plan	Wyoming Basin	Chokecherry/Sierra Madre Wind Farm	Carbon County, Wyoming	Proposed development of approximately 1,000 wind turbines and associated ancillary facilities on 220,000 acres of land. The project area includes private, state, and federally managed lands, and overlaps with GRSG Core Areas.[9]	Proposed
II/ VII	9-Plan	Wyoming Basin	Normally-Pressured Lance Natural Gas EIS	Sublette County, Wyoming	Proposed development of approximately 3,500 natural gas wells within 141,000 acres of state, private, and BLM-administered lands.	Proposed

Table 5.37
Reasonably Foreseeable Future Actions in Management Zone II/VII Likely to Impact GRSG Habitat

MZ	Planning Area	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
II/ VII	9-Plan	Wyoming Basin	Bird Canyon Field Infill Project	Sublette and Lincoln Counties, Wyoming	Proposed drilling and production of 348 new natural gas wells within 17,612 acres of BLM-administered land.	Proposed
Rights-of-way						
II/ VII	9-Plan, NW Colorado, Utah	Wyoming Basin, Rich-Summit-Morgan, Uintah, North Park, NWCO, Strawberry Valley, Carbon	Gateway South Transmission Line Project	17 Counties in Wyoming, Colorado, and Utah	Proposed 500 kV transmission line that would begin near Medicine Bow, Wyoming, and would extend south and west to a proposed substation near Mona, Utah. The proposed transmission line would span over 400 miles, with a 250-foot ROW, and would cross multiple land jurisdictions including lands administered by the BLM.[10]	Proposed
II/ VII	9-Plan, NW Colorado, Utah	Wyoming Basin, Northwest Colorado, Sheeprock, Strawberry Valley, Carbon, Bald Hills.	TransWest Express Transmission Line Project	Wyoming, Colorado, Utah, and Nevada	Proposed 600 kV transmission line extending from south-central Wyoming to southern Nevada. The transmission line corridor would span over 700 miles and would cross private, state, and federally owned lands. The proposed route and alternative routes under consideration would cross PPH and PGH.[11]	Proposed
II/ VII	9-Plan, Idaho and Southwest Montana	Wyoming Basin, East Central, Northern Great Basin, Box Elder	Gateway West Transmission Line Project	Wyoming and Idaho	Proposed 230 kV and 500 kV transmission line project between Glenrock, Wyoming, and Melba, Idaho. Approximately 1,000 miles of new high-voltage transmission lines would be constructed. The project would cross multiple land jurisdictions, including GRSG Core Areas in Wyoming.[12]	Proposed
II/ VII	9-Plan	Wyoming Basin	Riley Ridge to Natrona Pipeline Project	Sublette, Sweetwater, Fremont, and Natrona Counties, Wyoming	Proposed 243-mile pipeline from Riley Ridge to Big Piney, Wyoming. The pipeline would consist of a 50-foot ROW, and would cross GRSG Core Areas.[13]	Proposed

Table 5.37
Reasonably Foreseeable Future Actions in Management Zone II/VII
Likely to Impact GRSG Habitat

MZ	Planning Area	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
II/ VII	9-Plan	Wyoming Basin	Zephyr Power Line Transmission Project	Wyoming, Colorado, Utah, and Nevada	Proposed 500 kV transmission line spanning between Chugwater, Wyoming to just south of Las Vegas, Nevada.[14]	Proposed
Weeds						
II/ VII	9-Plan, Northwest Colorado	Wyoming Basin, Northwest Colorado, Powder River Basin, North Park	Invasive Plant Management EIS for the Medicine Bow - Routt National Forests, and Thunder Basin National Grassland	Wyoming and Colorado	Proposed treatment of invasive plant species using adaptive and integrated invasive plant treatment methods. These include manual, mechanical, biological, aerial, and ground herbicide applications. Potential treatment areas include GRSG Core Areas.[15]	Proposed

[1]Hiawatha Regional Energy Development Project Update: http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/rsfodocs/hiawatha/newsltrs.Par.79506.File.dat/Hiawatha03-2013.pdf
[2]LaBarge Platform Exploration & Development Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/pfo/labarge_platform.html
[3]Continental Divide-Creston Natural Gas Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/rfo/cd_creston.html
[4]Moneta Divide Natural Gas and Oil Development Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/lfo/moneta-divide.html
[5]Pinedale Anticline Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/pfo/anticline/seis.html
[6]Black Forks Project (Formally Moxa Arch Area Infill Project): http://www.blm.gov/wy/st/en/info/NEPA/documents/kfo/moxa_arch.html
[7]Oil Shale and Tar Sands Programmatic EIS http://ostseis.anl.gov/
[8]Atlantic Rim Natural Gas Field Development Project http://www.blm.gov/wy/st/en/info/NEPA/documents/rfo/atlantic_rim.html
[9]Chokecherry/Sierra Madre Wind Farm: http://www.blm.gov/wy/st/en/info/NEPA/documents/rfo/Chokecherry.html
[10]Gateway South Transmission Line Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/gateway_south.html
[11]TransWest Express Transmission Line Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/transwest.html
[12]Gateway West Transmission Line Project http://www.gatewaywestproject.com/
[13]Riley Ridge to Natrona Pipeline Project http://www.blm.gov/wy/st/en/info/NEPA/documents/rsfo/RRNP.html
[14]Zephyr Power line Transmission Project http://www.datcllc.com/datc-projects/zephyr/
[15]Invasive Plant Management EIS for the Medicine Bow – Routt National Forests and Thunder Basin National Grasslands http://www.fs.usda.gov/wps/portal/fsinternet/!ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gDfxMDT8MwRydLA1cj72BTMwMTAwjQL8h2VAQArb-_RA!!/?ss=110206&navtype=BROWSEBYSUBJECT&navid=1301100000000000&pnavid=130000000000000&accessDB=true&position=Project*&groupid=19692&ttype=projectdetail&pname=Medicine%20Bow-Routt%20National%20Forests%20&%20Thunder%20Basin%20National%20Grassland-%20Projects

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
Energy and Mining						
III	Utah	Carbon	South Unit Oil and Gas Development	Duchesne County, UT	Field development plan for leases held by Berry Petroleum; up to 356 new wells on up to 162 well pads may be drilled over the next 5 to 20 years; each well is subject to site-specific review and approval through the APD process. Includes GRSG mitigation.	Ongoing
III	Utah	Emery	Greens Hollow	Emery County, UT	Lease by application of 6,700 acres for coal extraction.	Planning phase
III	Utah	Emery	Flat Canyon Coal Lease by application	Sanpete County, UT	The Flat Canyon Coal Lease Tract is approximately 2,692 acres of federal coal reserves. Approximately 23 acres are within the Emery Population Area.	Forest Service complete d consent to BLM
III	Utah	Panguitch	Alton Coal Tract Lease-by-Application	Kane County, UT	Add 3,576 acres of federal surface or mineral estate to existing 300-acre mine on private land.	Planning phase
III	Utah	Parker Mountain	Parker Knoll Pump Storage Hydroelectric Federal Energy Regulatory Commission Project	Piute County, UT	Create electricity using a two-reservoir, gravity-fed system; approximately 200 acres of GRSG habitat would be lost; mitigation involves GRSG habitat-improvement work in areas adjacent to the lost habitat.	Planning phase
III	Utah	Carbon	West Tavaputs Plateau Natural Gas Full Field Development Plan	Carbon County, UT	Project approved 626 well and 120 pads along with the infrastructure of roads, pipelines, compressor facilities and other facilities needed to produce oil and gas from the project area.	Ongoing
III	Utah	Carbon	Williams Draw Lease by Application	Emery County, UT	The proposed action includes 4,200 acres of federal surface and mineral estate; the proposal may have several vents, drilling exploration holes on the	Planning phase

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
					surface and underground and load-out facilities.	
III	Utah	Carbon	Gasco Energy Inc. Uinta Basin Natural Gas Development Project	Uintah and Duchesne counties, UT	Approximately 206,826 acres west of the Green River and north of the Duchesne/Uintah and Carbon County line.	Ongoing
III	Utah	Sheeprocks	August 2015 Oil and Gas Lease Sale	Juab County, UT	Proposed sale of 9 parcels, approximately 12,943 acres, and subsequent lease issuance to successful bidders	Planning phase
III	Nevada and Northeastern California	Southern Great Basin	Long Canyon Mine	30 miles east of Wells, Nevada, and 32 miles west of West Wendover, Nevada, on Interstate 80.	Open-pit gold mining operation located on the east side of the Pequop Mountains. Operations would include one open pit, a heap leach pad, waste rock dump, tailing storage facility, and other ancillary facilities. The operator, Newmont Mining, is also proposing a natural gas pipeline for self-power generation on site. The pipeline would run from the Ruby pipeline south on existing ROWs to the project site, approximately 40 miles. The proposed disturbance acreage for operations is 2,116 acres, including public, private, and split estate lands. The projected life of mine is 14 years, including construction, operations, and closure and post-closure monitoring.	Planning phase
III	Nevada and Northeastern California	Southern Great Basin	Salt Wells Geothermal Utilization Project	Nevada	120 MW power plant	Approved. Construction not initiated

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
Lands and Realty						
III	Utah; Nevada and Northeastern California; Northwest Colorado; 9-Plan	Bald Hills; Sheeprocks; Southeast Nevada; Northwest Colorado; Wyoming Basin	TransWest Express	WY, UT, CO, NV	725 mile 600 kV transmission line.	Planning phase
III	Utah; Northwest Colorado; 9-Plan	Sheeprocks; Northwest Colorado; Wyoming Basin	Energy Gateway South Transmission Line EIS	WY, UT, CO	650-mile 500-kV transmission line	Planning phase
III	Utah; Nevada and Northeastern California; Northwest Colorado; 9-Plan	Bald Hills; Sheeprocks; Southeast Nevada; Northwest Colorado; Wyoming Basin	Zephyr Transmission Line	WY, UT, CO, NV	500-kV transmission line	Planning phase
III	Utah	Carbon	Emery Telecom Ford Ridge Fiber Optic Line	Carbon and Utah counties, UT	Installation of 18.38 miles of fiber optic line (2.76 miles on BLM-administered lands); 13.06 miles of line would be buried along existing roads, and 5.32 miles would be attached to existing PacifiCorp power poles; the line would run from Helper, Utah, to the towers on Ford Ridge and back out to US Highway 6; the project would affect approximately 3.25 acres of BLM-administered lands.	Ongoing
III	Nevada and Northeastern California	Southeast Nevada	Southern Nevada Water Authority ROW	Begins near Ely, Nevada and ends northeast of Las Vegas, Nevada	241 miles of 230 kV, 69 kV, and 25 kV power lines; 258 miles of pipeline; ancillary facilities include pump stations, water treatment facility within corridor.	Ongoing
Fuels and Vegetation						
III	Utah	All populations in UT	Noxious weed treatments	UT	Noxious weed treatments	Ongoing

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
III	Utah	Sheeprock	Black Crook Treatment	Tooele County, UT	Treatment of 1,820 acres of pinion-juniper to enhance sagebrush habitat.	Ongoing
III	Utah	Sheeprock	Vernon Sage Harrow	Tooele County, UT	1,792 acres of treatment.	Ongoing
III	Utah	Sheeprocks	Furner Valley Habitat Improvement Project	East Tintic Mountains	800 acres of treatment	Schedule d for Fall 2015
III	Utah	Carbon	Ford Ridge Fuels Reduction and Vegetation Restoration	Ford Ridge, UT	The project would remove dead and dying trees, and reduce live crown spacing by thinning the remaining live trees within approximately 6,840 acres	NEPA complete d in 2013
III	Utah	Carbon	Cottonwood Ridge Pinyon-Juniper Treatment	Carbon County, UT/ West Tavaputs Plateau	The project would remove encroaching pinyon and juniper trees within 2,070 acres of BLM and State Surface	Planning phase
III	Utah	Carbon	Upper Anthro Lop and Scatter	Duchesne County, UT	Remove encroaching conifers from up to 11,800 acres of sagebrush and mountain brush communities on Anthro Mountain; project will maintain habitat for GRSG and sagebrush-obligate species.	Ongoing. Impleme ntation over a 5- to 7-year period beginning in 2013.
III	Utah	Panguitch	Johns Valley Vegetation	Dixie National Forest, UT	Vegetation management project that includes 9,000 acres of treatment, including sagebrush.	Planning phase
III	Utah	Panguitch	Hodge Ranch and Angle Bench Vegetation Enhancement	Piute County, UT	Remove 1,500 acres of Phase I and II pinyon-juniper and up to 1,400 acres of sagebrush enhancement	Planning phase
III	Utah	Parker Mountain	Boulder Foothills Fuels Reduction	Fishlake National Forest, UT	Mechanically treat 3,834 acres with bobcat and chainsaw, pile, and burn.	Ongoing
III	Utah	Parker Mountain	Porcupine Fuels Treatment	Fishlake National Forest, UT	Prescribe burn insect and disease infected conifer stands, and regenerate aspen within 35,000-acre analysis area.	Planning phase

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
III	Utah	Carbon and Emery	Shalom Timber Sale	Manti National Forest, UT	Timber and fuels management 9,000 acres; work to be accomplished through 2020; traditional timber harvest treatments, followed with prescribed burning treatments	Ongoing
III	Utah	Emery	Swasey Wildlife Improvement and Hazardous Fuels Reduction Project	Emery County, UT	Multi-phase project that will treat a total of 8,422 acres; most of the project has been treated; phase IV (400 acres) was just submitted for funding; project is a combination of pinyon-juniper mastication and prescribed fire.	Ongoing
III	Utah	Panguitch	Upper Kanab Watershed Vegetation Creek	Kane County, UT	Vegetation management project that includes 51,600 acres of treatment in a 130,000 acres area over the next 15 years using a variety of treatment methods; average of 1,800 to 2,000 acres per year.	Ongoing
III	Utah	Parker Mountain	GRSG Habitat Improvement Projects	Piute and Garfield counties, UT	Over the next 10 years, a total of 40,000 acres of pinyon-juniper and sagebrush habitat will be improved for GRSG; a variety of mechanical treatments will be used to expand and improve existing habitat along the Parker Front. Yearly projects of 1,000-3,000 acres would be completed.	Ongoing
III	Utah	Hamlin Valley, Bald Hills, and Panguitch	Programmatic Environ-mental Assessment	Cedar City Field Office, UT	Vegetation management project to enhance previous treatments that have occurred over the past 60 years using a variety of management tools	Project under NEPA review; decision antici-pated in 2014-2015

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III
Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
III	Nevada and Northeastern California	Southern Great Basin	Battle Mountain WUI EA	Battle Mountain District, NV	EA	Planning phase
III	Nevada and Northeastern California	Southern Great Basin	Overland Pass	Ruby Mountains Ranger District, NV	Fuels treatment.	Ongoing
III	Nevada and Northeastern California	Southern Great Basin	Spruce Mountain Restoration Project	Wells Field Office, NV	Restoration of up to 10,000 acres to improve wildlife habitat, reduce hazardous fuels, improve forest health, and protect cultural resources.	Ongoing
III	Nevada and Northeastern California	Southern Great Basin; Quinn Canyon Range	Pioche/ Caselton WUI Project	Ely District, NV	11,300-acre project area; 3,246 to 4,711 acres identified for treatment. Reduce fire threat and improve wildlife habitat by thinning pinyon/juniper.	Ongoing
III	Nevada and Northeastern California	Southern Great Basin	Stonehouse WUI/Non-WUI Project	Ely District, NV	23,676 acres project area. Reduce fire threat and improve wildlife habitat by thinning pinyon/juniper in PPH adjacent to low value habitat, affects three major GRSG leks.	Ongoing
III	Nevada and Northeastern California	Northwest Interior	Montana Mountain Fuels Project	Winnemucca District, NV	346,000-acre planning area to reduce fire threat and improve wildlife habitat.	Ongoing
III	Nevada and Northeastern California	Northwest Interior	Double H/Bilk Creek	Winnemucca District, NV	390,856-acre planning area to reduce fire threat and improve wildlife habitat.	Planning phase
III	Nevada and Northeastern California	Quinn Canyon Range	Cave/Lake Valley Watershed Plan	Ely District, NV	121,600 acres of treatments identified with interdisciplinary objectives.	Planning phase
Livestock Grazing						
III	Utah	Panguitch	Grand Staircase-Escalante National Monument Livestock Grazing Plan Amendment	Kanab Field Office, Kane County, Utah	2.1 million acre planning area to update and integrate livestock and rangeland management with the other resources in the Monument Management Plan.	Planning phase

Table 5.38
Reasonably Foreseeable Future Actions in Management Zone III
Likely to Impact GRSG Habitat

MZ	Sub-Region	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
III	Utah	All populations in UT	Fence Marking	UT	The NRCS is planning to mark fences within 3.2 miles of throughout Utah on private lands.	Ongoing
III	Utah	Parker Mountain	Coyote Hollow Grazing Assessment	Dixie National Forest, UT	Environmental analysis of the Coyote Hollow C&H Allotment.	Analysis anticipated in 2015.
Travel Management						
III	Utah	All population areas in UT	Motorized Travel Plan Implementa-tion	UT	Implementation of motorized route designation plans across the sub-region	Ongoing
III	Utah	Sheeprocks	OHV Organized Races	Sheeprock/ Tintic Mountain OHV Area	Three sanctioned motorcycle races permitted annually	Annual
Other Projects/Actions						
III	Utah	Box Elder, Ibapah, Sheeprocks	Use of Military Operating Area	West Desert, UT	Department of Defense testing and training exercises	Ongoing

This table includes a selection of some of the larger projects from the reasonably foreseeable future actions tables in the RMPAs/LUPAs for MZ III. The full tables can be found in each EIS.

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV
Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
Energy and Mining						
IV	Idaho and Southwestern Montana	Northern Great Basin	Sawtooth #4 Plan of Operation Modification	Twin Falls District, Idaho	Locatable mineral surface mining over 20 acres.	NEPA in progress.
IV	Idaho and Southwestern Montana	Northern Great Basin	Mineral Extraction	Dillon Field Office, Montana	Approximately 25 notices for locatable mineral extraction covering less than 50 acres.	Ongoing
IV	Idaho and Southwestern Montana	Northern Great Basin	Quarry Expansions	Sawtooth National Forests, Utah and Idaho	Several quarry expansions covering 40 acres total.	Planned for 2016.

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
IV	Idaho and Southwestern Montana	East Central	Dairy Syncline Phosphate Mine	Soda Springs, Idaho	Phosphate mine on estimated 580 acres (281 acres of open pit) within PGH/PHMA.	Planning phase
IV	Idaho and Southwestern Montana	Northern Great Basin	Oil and gas lease nominations	Rogerson-Brown's Bench, Idaho	Determine whether to offer leases on up to 90,000 acres.	Deferred, pending comple-tion of Jarbidge RMP and GRSG EIS
IV	Idaho and Southwestern Montana	East Central	Oil and gas lease nominations	Payette-Weiser area, Idaho	Determine whether to offer oil and gas leases. Several nominations, totaling an estimated 181,000 acres.	Deferred, pending comple-tion of Four Rivers RMP and GRSG EIS
IV	Oregon	Northern Great Basin	Malheur Queen Placer Project	North-central Malheur County, Oregon	Approximately 800 acres approved for development of placer gold extraction.	Develop-ment underway
IV	Oregon	Northern Great Basin	High Bar/Upper and Lower Pine Creek Placer Mining Project	Baker County, Oregon	Up to 250 acres of activity would be disturbed for mineral extraction.	Planning phase
IV	Nevada	Northern Great Basin	Round Mountain Gold Mine			
Expan-sion	Nye County, Nevada	Expansion of existing facilities at the Round Mountain Mine and development of new mining and leaching facilities at the adjacent Gold Hill ore deposit.	Planning phase			

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
IV	Nevada	Northern Great Basin	Angel Wing Exploration Plan	60 miles northwest of West Wendover, Nevada, on the Utah/Nevada State Line	Expansion of mining exploration activities, including construction of drill pads and access roads and existing road maintenance, from a 3.3 acre Notice to 60 acres. Access to the proposed Plan is through Utah near the town of Grouse Creek.	Planning phase
IV	Nevada	Northern Great Basin	Murdock Mountain Phosphate Prospecting Permit	35 miles northwest of West Wendover, Nevada, and 10 miles southwest of Montello, Nevada	Phosphate exploration drilling and trenching in the Murdock Mountain area. The operator is proposing to construct 31 drill pads with 2 drill holes per pad and 29 exploration trenches measuring 100 feet long by 5 feet wide by 5 feet deep. Exploration roads will also be constructed and existing roads will be utilized. Exploration operations are anticipated to take 200 days to complete.	Planning phase
Lands and Realty						
IV	Idaho and Southwestern Montana	Northern Great Basin; Snake-Salmon-Beaverhead	Gateway West 230/500 Transmission Line Project	Wyoming, Southern Idaho	Authorize ROW for 1,100-mile 500-kV transmission line.	Pending; Scheduled for imple-mentation starting 2016
IV	Idaho and Southwestern Montana; Oregon	Baker; Northern Great Basin	Boardman to Hemingway Transmission Line Project	From Boardman, Oregon to Melba, Idaho	A proposal for an approximately 300-mile 500-kV transmission line.	Project under NEPA review.
IV	Oregon	Northern Great Basin	North Steens 230-kV Transmission Line Project	Harney County, Idaho	North Steens is a 29-mile 230-kV transmission line that would convey 104 MW of power generated from wind farms proposed on private land on the north side of Steens Mountain.	Project approved and ROD signed in December 2011; in litigation.

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
IV	Nevada	Northern Great Basin	China Mountain Wind Project	Northeastern Nevada	Utility-scale wind facility	Temporarily deferred pending NVCA GRSG EIS
IV	Idaho and Southwestern Montana	Northern Great Basin	Owyhee Land Exchange	Western Owyhee County, Idaho	Proposing to dispose of approximately 33,000 acres of non-GRSG habitat and acquiring around 38,000 acres of primarily GRSG habitat	Proposal
Fuels and Vegetation						
IV	Idaho and Southwestern Montana	Northern Great Basin	Juniper Treatments in Pole Creek Allotment	Owyhee Field Office, Idaho	Juniper removal to enhance resource conditions on 24,486 acres of public, private, and state lands.	Decision issued; treatment implementation pending litigation
IV	Idaho and Southwestern Montana	Northern Great Basin	Juniper Treatment in Trout Springs Allotment	Owyhee Field Office, Idaho	Juniper removal to enhance resource conditions on 29,475 acres of public, private, and state lands.	Planning
IV	Idaho and Southwestern Montana	Northern Great Basin	Upper Castle Creek Fuels Project	Bruneau Field Office, Idaho	Juniper control project on approximately 33,000 acres. 25,000 acres implemented; anticipate 2,000-4,000 acres per year for the remaining areas.	Ongoing through 2014
IV	Idaho and Southwestern Montana	Northern Great Basin	Curlew Fuel Breaks and Juniper Reduction Project	Southeast Idaho	Compartmentalize the Curlew area using existing roads to improve wildfire suppression and reduce wildfire growth over 60,000 acres. Efforts will help to retain existing intact Wyoming sagebrush habitat. Remove encroaching junipers from within Wyoming sagebrush.	Planning; project implementation anticipated in 2017.
IV	Idaho and Southwestern Montana	Northern Great Basin	Burley Landscape Sage-Grouse Habitat Restoration	Burley Field Office, Idaho	Treat encroaching juniper on approximately 38,000 acres.	Approximately 8,500 acres already completed; implementation of

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
						remaining 29,500 acres expected over the next 7 years
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Paradigm Project	Four Rivers Field Office, Idaho	Fuel break project that would create up to 294 miles of fuel breaks between 50 and 300 feet wide over a 10-year period. Fuel breaks would be associated with roads and other linear disturbances. At the maximum width of 300 feet, up to 10,690 acres would be directly affected. 2,111 acres of PPH/PHMA and 24,667 acres of PGH/GHMA in project area; fuel breaks would affect 61 acres of sagebrush in PPH/PHMA and 606 acres in PGH/GHMA.	Pending
IV	Idaho and Southwestern Montana	Northern Great Basin	South Owyhee Fuel Breaks	Boise District, Idaho	Fuel breaks over 2,000,000 acres, 850 miles.	Draft EA
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Big Desert Fuel Breaks	Idaho Falls and Twin Falls Districts, Idaho	Compartmentalize the Big Desert management area using existing roads to improve wildfire suppression and reduce wildfire growth; efforts will help to retain intact Wyoming sagebrush habitat within the northern portion of the management area. 291 miles of existing desert roads with a footprint of 10,581 acres. Upper Snake Field Office (FO): 245 miles of roads with 8,908 footprint acres. Shoshone FO: 46 miles of roads with 1,673 footprint acres.	NEPA is complete and project began in 2012 within the Upper Snake FO; those fuel breaks identified within the Shoshone FO require further analysis and consultati-on before NEPA can

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
						be finalized.
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Big Desert Noxious Weed Treatments	Idaho Falls District, Idaho	Treating noxious weeds within the Big Desert management area over 600,000 acres. Annual treatment target of 5,000 acres.	Ongoing, began in 2006.
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Cheatgrass Treatments	Idaho Falls District, Idaho	Chemically reduce cheatgrass densities over 7,000 acres to modify fire return intervals and allow for seeded native species to become established.	Planning phase
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Salmon-Challis National Forest Forest-wide Invasive Plant Treatment EIS	Salmon-Challis National Forest	Programmatic noxious weed treatment planning within the nonwilderness portion of the Salmon-Challis National Forest (3.2 million acres)	Planning phase
IV	Idaho and Southwestern Montana	Northern Great Basin	Twin Falls District Noxious Weed and Invasive Plant Treatments	Twin Falls District, Idaho	Proposed action is to use prevention, prescribed fire, herbicides, and manual, mechanical, and biological methods to treat areas dominated by annual invasive species to restore perennial grasses, forbs, and shrubs. This is a programmatic planning effort. Estimated annual restoration is 5,000-10,000 acres in Burley Field Office (FO), 10,000-15,000 acres in Shoshone FO, and 10,000-15,000 acres in Jarbidge FO. Ten-year total for each office could approach 100,000 acres in Burley FO, 150,000 acres in Shoshone FO, and 150,000 acres in Jarbidge FO.	Planning phase. Implement ation is planned to cover 10 years starting in 2015.
IV	Idaho and Southwestern Montana	Northern Great Basin	Shrub Planting	Twin Falls District, Idaho	Reintroduction of shrub species through hand planting of seedlings; up to 200,000 seedlings (13,000	Implemen-tation since 2010 and

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
					acres) may be planted annually.	expected to continue over the next 10 years.
IV	Idaho and Southwestern Montana	Northern Great Basin	Twin Falls District Wildlife Tracts Restoration	Twin Falls District, Idaho	Proposed action is to use prescribed fire, chemical, drill and harrow seeding, shrub seeding, and plantings to establish perennial vegetation and restore native shrub habitat on wildlife tracts. 500-1,000 acres per year, for a cumulative total of 10,000 acres over ten years.	Implemen-tation has been occurring since 2011 and is planned to continue over the next 8 years.
IV	Oregon	Northern Great Basin	Five Creeks Rangeland Restoration Project	Three Rivers and Andrews/ Steens Resource Areas, Oregon	A landscape-scale vegetation treatment encompassing approximately 73,500 acres (approximately 26,000 acres in the CMPA) to return vegetation communities to historic compositions and reduce hazardous fuel loads. Various forms of prescribed fire and mechanical treatments have been used to reduce influence of encroaching western juniper.	Ongoing
IV	Oregon	Northern Great Basin	Multiple restoration projects	Three Rivers Resource Area, Oregon	Implementation plans include thinning, piling, pile burning, and implementing a forest underburn.	Ongoing
IV	Oregon	Northern Great Basin	District-wide noxious weed treatments	Oregon	Ongoing interagency noxious weed treatment efforts with Oregon Department of Agriculture and Oregon counties.	Ongoing
IV	Oregon	Northern Great Basin	District-wide Vegetation Management (Weed EA)	Harney County, Oregon	Use new chemicals to treat noxious and invasive species.	Planning phase
IV	Oregon	Baker; Northern Great Basin	Baker Habitat Restoration	Baker County, Oregon	Multi-year phased hazardous fuels and wildlife habitat restoration project on	Planning phase

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
			and Fuels Treatment projects		approximately 45,000 acres.	
IV	Utah	Box Elder	Noxious weed treatments	Utah	Treating noxious weeds	Ongoing
IV	Nevada	Northern Great Basin	Santa Rosa Fuels Project	Winne-mucca District, Nevada	355,699-acre planning area to reduce fire threat and improve wildlife habitat.	Ongoing
IV	Nevada	Northern Great Basin	North Tuscarora Sage-Grouse Habitat Restoration Project	Elko District Office, Nevada	Restoration of up to 10,000 acres of GRSG habitat. Treatments would improve, protect GRSG habitat, protect PPH/PHMA, protect Lahontan Cutthroat Trout Streams, improve wildlife habitat, reduce invasive weeds, and reduce hazardous fuels.	Planning phase
IV	Nevada	Northern Great Basin	Spruce Mountain Project	Elko District Office, Nevada	Spruce Mountain seeding maintenance over 700 acres. Mastication and seeding to reduce fire threat and improve wildlife habitat.	Ongoing
Livestock Grazing						
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Grazing Permit Renewals	Challis Field Office	Renewing/modifying 2 to 5 grazing permits per year for the next ten years over 770,000 acres	Project under NEPA review.
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Range NEPA for C&H allotments	Boise National Forest, Idaho	Allotments cover over 53,000 acres.	Projects under NEPA review.
IV	Idaho and Southwestern Montana	Northern Great Basin	Allotment Management Plan Updates	Sawtooth National Forest, Idaho and Utah	Cattle and sheep allotment management plan updates on over 350,000 acres.	Ongoing
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Allotment Management Plan Updates	Sawtooth National Forest, Idaho	Cattle and sheep allotment management plan updates on over 140,000 acres.	Ongoing
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Grazing Allotment Management NEPA	Salmon-Challis National Forest	Grazing allotment management NEPA on over 2 million acres.	Ongoing

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
IV	Idaho and Southwestern Montana	Southwest Montana	Cessation of Lima-Tendoy Sheep Grazing	Beaverhead -Deerlodge National Forest	Permittee waiving sheep permits on 11,700 acres in PPH/PHMA back to Forest Service. Allotments will be closed to future domestic sheep grazing. No new grazing permits for any livestock will be issued for the Indian Creek Allotment. Three-year trial of 100 AUMs fall cattle grazing for Bear Canyon.	Ongoing. NEPA review and new AMP after 2015 grazing season.
IV	Nevada	Northern Great Basin	White Rock Mountain Aspen Exclosures	Northeastern Nevada	Place up to nine exclosures around aspen stands to protect from overgrazing by livestock.	Planning process
IV	Utah	Box Elder	Fence marking	Utah	The NRCS is planning to mark fences within 3.2 miles of leks throughout Utah on private lands.	Ongoing
Wild Horses and Burros						
IV	Idaho and Southwestern Montana	Northern Great Basin	Wild horse gathers	Owyhee Field Office, Idaho	Gather, fertility treatment, removal of excess wild horses from HMAs. Covers 128,389 acres of public and other (private and state) land.	EAs and decisions have been approved; gathers and treatment are pending due to funding and other priority treatments within the BLM wild horse program.
IV	Oregon	Northern Great Basin	Wild horse gathers	Oregon	Gather wild horses.	Ongoing
Recreation						
IV	Idaho and Southwestern Montana	Northern Great Basin	Special Recreation Permits	Owyhee Field Office, Idaho	Various motorcycle, foot, and mountain bike races, horse endurance rides, dog trials, pioneer treks, and poker runs on 260,000 acres.	Ongoing

Table 5.39
Reasonably Foreseeable Future Actions in Management Zone IV Likely to Impact GRSG Habitat

MZ	Sub-region	Affected GRSG Population	Project Name	Project Location	Project Description	Project Status
Travel Management						
IV	Idaho and Southwestern Montana	Northern Great Basin	Curlew/ Deep Creek Travel Management Plan Implementation	Idaho Falls District, Idaho	Implement Travel Management Plan on 375,000 acres; limit motorized travel to designated routes, prohibit cross-country travel	Ongoing
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	North Highway 20 Travel Plan	Idaho Falls District, Idaho	Designate 127 miles of existing trails; construct 52 miles of new trails, construct 3 acres of parking areas, close and rehabilitate 116 miles of existing routes.	Pending
IV	Utah	Box Elder	Motorized Travel Plan Implementation	Utah	Implementation of motorized route designation plans across the planning region.	Ongoing
Land Use Planning						
IV	Idaho and Southwestern Montana	Northern Great Basin	Jarbidge RMP	Jarbidge Field Office, Idaho	Revise the Jarbidge RMP that provides a comprehensive plan for 1,366,000 acres that further restores or maintains resource conditions and provides for the economic needs of local communities over the long term	Ongoing
IV	Idaho and Southwestern Montana	Snake-Salmon-Beaverhead	Craters LUP Amendment	Craters of the Moon National Monument and Preserve, Idaho	Analyze a range of alternatives for livestock grazing in the Craters of the Moon covering 300,000 acres (i.e., identify lands available or unavailable for grazing, identify the amount of forage available, seasons of use, range improvements)	Ongoing

This table includes a selection of some of the larger projects from the reasonably foreseeable future actions tables in the RMPAs/LUPAs for MZ IV. The full tables can be found in each EIS.

5.5 AIR QUALITY

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect air quality are actions related primarily to fluid minerals (oil and gas) development. Oil and gas development has occurred, is occurring, and will continue to occur on both federal and nonfederal oil and gas

estate within the planning area. Exploration for and development of oil and gas resources contribute to short-term particulate matter emissions that can combine with naturally occurring dust generation to create temporary cumulatively degraded visibility conditions depending on the timing and location of the cumulative actions. They also contribute criteria pollutants and hazardous pollutants through the combustion of fuel in drill rigs, construction equipment, and vehicles, potentially resulting in increases in ambient concentrations of these pollutants.

Oil and gas operations in the past have played and presently play a significant role in ozone formation by being primary sources of volatile organic compounds and nitrogen oxides, the components of ozone. In the Uintah Basin, where ozone frequently exceeds NAAQS, oil and gas operations were found to be responsible for 98 to 99 percent of volatile organic compounds and 57 to 61 percent of nitrogen oxides in 2011-2012 (Stoeckenius 2013). Based on the reasonably foreseeable future actions displayed in **Table 5.2**, oil and gas development will likely continue to be a primary factor impacting air quality, and more specifically, ozone formation, in the future.

Additionally, past, present, and reasonably foreseeable future actions related to transmission line construction and coal extraction have and are likely to continue to impact air quality through the combustion of fuel in construction and extraction equipment use and through vehicular travel to and from construction and extraction sites.

The management actions proposed in this LUPA/EIS would reduce the number of oil and gas wells developed on the federal mineral estate in the planning area compared with current management actions, thereby reducing air emissions associated with these actions. While air emissions would likely be reduced and proposed management actions would have no incremental cumulative air quality impact, restricting oil and gas development on federally administered lands could shift development to nonfederal lands.

Similarly, restricting transmission line construction through the establishment of ROW exclusion and avoidance areas within the planning area could reduce localized air emissions associated with these actions on BLM-administered lands, but also could shift construction to nonfederal lands. These restrictions may limit the ability to power oil and gas well equipment in the Uinta Basin with electricity instead of natural gas- or diesel-fired compressors and generators, contributing to air quality impacts in the basin.

There is one exemption under all alternatives to the ROW exclusion and avoidance areas. The TransWest Express ROW has been granted an exemption; however, it is not anticipated that long-term cumulative impacts on air would increase due to the establishment of a ROW for TransWest Express where it has been proposed in the Final EIS for that project. Short-term cumulative air impacts could be increased in those areas where the ROW is permitted, but mitigation proposed in the TransWest Express Final EIS should help reduce any long-term cumulative impacts on areas within GRSG habitat.

Alternatives Analysis

Cumulative impacts on air quality would be slightly reduced under Alternatives B and C as compared with Alternative A due to restrictions on ROWs, surface mining, oil and gas leasing, and other uses. Alternatives D and E and the Proposed Plans would place fewer restrictions on

actions that may impact air quality and therefore may have slightly greater cumulative impacts on air quality than the other alternatives.

The management actions proposed in this LUPA/EIS are expected to have only beneficial or negligible impacts on air quality. Due to this, the incremental contribution to the cumulative impacts on air quality under all action alternatives are expected to be less or the same as those under the current management.

5.6 CLIMATE CHANGE

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have contributed greenhouse gases to the atmosphere include burning of fossil fuels, wildfire, and fuel combustion. Reasonably foreseeable future actions that could impact greenhouse gases through a reduction in carbon stores include vegetation management actions focused on increasing GRSG habitat.

Oil and gas and coal development has occurred, is occurring, and would continue to occur on both federal and nonfederal fluid mineral estate within the planning area. Oil and gas development results in emissions of greenhouse gases during fuel combustion in vehicles, drill rigs, and construction equipment. Greenhouse gases are emitted during the production transport and burning of coal. The management actions under the Proposed Plans and all action alternatives, except for Alternative E, in this LUPA/EIS would reduce the number of oil and gas wells developed on federal mineral estate in the planning area compared with current management actions, thereby reducing greenhouse gas emissions associated with these actions on federal mineral estate. However, it is anticipated that oil and gas well development may shift to some extent from federal mineral estate to nonfederal mineral estate, so the cumulative reduction in greenhouse gas emissions would be minimal. Regarding coal resources, Alternatives B and C and the Proposed Plans would reduce the amount of coal development from federal mineral estate by varying amounts, thereby reducing greenhouse gas emissions.

Fires, particularly uncontrolled fires, can emit large quantities of greenhouse gases into the atmosphere, including carbon dioxide, methane, and nitrous oxide (EPA 2012, page 7-21 to 7-22); fires also remove vegetation that acts as a carbon sink. Proposed management actions would restrict the amount of vegetation that can be burned in a prescribed burn, or that can be allowed to burn in an unplanned natural ignition, to maintain sagebrush canopy cover, potentially resulting in fewer fire-related emissions in the short term. State and local efforts to protect GRSG would continue to address the threat of fires through a mix of voluntary and regulatory mechanisms on state and private lands.

Vegetation management actions focused on reducing pinyon-juniper encroachment into GRSG habitat could impact climate change by eliminating potential carbon storage opportunities. Vegetation treatments listed in **Table 5.2** could impact climate change by reducing carbon storage potential. State and local vegetation management efforts would also reduce carbon storage through a mix of voluntary and regulatory mechanisms on state and private lands to improve GRSG habitat.

The TransWest Express ROW is exempt from the restrictions outlined in this LUPA/EIS. The negligible short-term contribution of the TransWest Express project to cumulative greenhouse

gas emissions would be offset in the long term by the use of renewable energy resources, which would contribute much less long-term operational greenhouse gas emissions than conventional nonrenewable energy sources such as coal or gas-fired power plants. Assuming the transmission line carries 80 percent renewable energy, there would be a net saving of 3,000 MW of generation resulting in a savings of about 16,000 gigawatt hours of power production from fossil fuels on an annual basis. The EPA Greenhouse Gas Equivalencies Calculator indicates that this would reduce carbon dioxide equivalent emissions by 12.2 million tons per year. Accordingly, in the long term, the TransWest Express project and its alternatives would decrease potential contributes to cumulative greenhouse gas emissions and global climate change.

Alternatives Analysis

Cumulative impacts on climate change would be slightly reduced under Alternatives B and C due to restrictions placed on fossil fuel development, surface mining, ROWs, and other greenhouse gas-emitting uses.

The management actions proposed in this LUPA/EIS are expected to have only beneficial or negligible impacts on climate change. Due to this, the incremental contribution to the cumulative impacts on climate change under all action alternatives and the Proposed Plans are expected to be less or the same as those under the current management.

Overall, federal and nonfederal actions within the planning area would not have a significant cumulative impact on climate change. Actions in the planning area contribute a very small percentage of state and national greenhouse gas emissions; carbon dioxide emissions for all of Utah were 1.1 percent of total US carbon dioxide emissions (2010 numbers) (US Energy Information Administration 2013b).

5.7 SOIL RESOURCES

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect soil resources include transmission line projects, noxious weeds and vegetation treatments, habitat improvement projects, controlled burns, coal extraction, gravel extraction, tar sands extraction, seismic data collection, oil and gas development, the water pipeline project, prescribed burns, the timber sale, the hydroelectric project, and hardrock prospecting.

Some of the above habitat restoration activities would help to improve soil health, while the rest of the activities would generally result in erosion and compaction. State efforts to protect GRSG and its habitat would help to improve soil health on state and private lands.

Alternatives Analysis

Under Alternative A, ROWs, mineral development, recreation, travel, and grazing would continue to be permitted throughout the planning area with the result of continued cumulative impacts on soil resources. Management under Alternatives B, C, D, and E, and the Proposed Plans would include limitations on surface disturbing activities, such as ROW development and mineral development, therefore reducing the potential for long-term cumulative impacts on soil resources. Such activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, which could increase stress on soil resources in the areas where development occurs, particularly previously undisturbed areas and sensitive or highly

erodible soils, even where mitigation efforts are implemented. The impact would be felt the most under Alternative C where surface development would be precluded in all or part of mapped occupied GRSG habitat. Under Alternatives B, D and E, and the Proposed Plans development activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, although not to the same extent as under Alternative C.

5.8 WATER RESOURCES

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect water resources include transmission line projects, noxious weeds and vegetation treatments, habitat improvement projects, controlled burns, coal extraction, gravel extraction, tar sands extraction, seismic data collection, oil and gas development, the water pipeline project, prescribed burns, the timber sale, the hydroelectric project, and hardrock prospecting.

Some of the above habitat restoration activities would help to decrease runoff and improve water quality, while the rest of the activities would generally result in erosion-contaminated runoff and the introduction of chemicals into the natural environment with the potential for spills and related water contamination. State and local efforts to protect GRSG would help decrease runoff and improve water quality on state and private lands.

Alternatives Analysis

Under Alternative A, the BLM would continue to allow ROWs, mineral development, recreation, travel, and grazing throughout the planning area with the result of continued cumulative impacts on water resources. Alternatives B, C, D, and E, and the Proposed Plans would include limitations on surface disturbing activities, such as ROW development, grazing, and mineral development, therefore reducing the potential for long-term cumulative impacts on water resources. Such activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, which could increase soil erosion and runoff, resulting in increased water quality issues, even where mitigation efforts are implemented. The impact would be felt the most under Alternative C where surface development would be precluded in all or part of mapped occupied GRSG habitat. Under Alternatives B, D, and E, and the Proposed Plans development activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, although not to the same extent as under Alternative C.

5.9 VEGETATION (INCLUDING NOXIOUS WEEDS; RIPARIAN AND WETLANDS)

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect vegetation are vegetation and habitat management and improvement projects, noxious weed control, wildland fire management, livestock grazing management, wild horse and burro use, energy development, and travel management planning. State and local efforts to protect GRSG would affect vegetation on state and private lands.

Sagebrush-promoting and conifer removing vegetation and habitat treatments would retain and enhance sagebrush vegetation and overall ecosystem productivity, while reducing the distribution of invasive weeds and woody conifer species. Given the limited distribution of suitable sagebrush habitats and the cost of habitat restoration, management plans that protect intact sagebrush acreage and restore impacted areas strategically to improve habitat connectivity

have the best chance of increasing the amount and quality of sagebrush cover (Manier et al. 2013).

An assortment of nonnative annuals and perennials and native conifers are currently invading sagebrush ecosystems. Many areas throughout the range of GRSG are at high risk from invasive plants; the most concentrated areas of risk include the Intermountain West and Great Basin (Manier et al. 2013). Invasive plants can alter plant community structure and composition, productivity, nutrient cycling, and hydrology, and may competitively exclude native plant populations. Invasive plant spread may result in habitat loss and fragmentation, and may also increase the risk of wildfire. The spread of invasive plants such as cheatgrass has increased the frequency and intensity of fires in some areas (Balch et al. 2012). 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 within plant communities. The intent of these management programs is to improve rangeland condition and enhance sagebrush ecosystems.

Slow rates of re-growth and recovery of vegetation after disturbances (driven by low water availability and other constraints) coupled with high rates of disturbance and conversion to introduced plant cover have contributed to the accumulating displacement and degradation of the sagebrush ecosystem (Beck et al. 2009). Big sagebrush does not re-sprout after a fire, but is replenished by wind-dispersed seed from adjacent unburned stands or seeds in the soil. Depending on the species and the size of a burn, a return to pre-burn community cover can take 13 to 100 years (Connelly et al. 2004). When management decreases fire size by controlling natural ignitions, the indirect impact is that vegetation ages across the landscape and early successional vegetation communities are diminished. Fire suppression may preserve the condition and connectivity of some vegetation communities. This is particularly important in areas where fire frequency has increased because of weed invasion, or where landscapes are highly fragmented. Fire suppression can also lead to increased fuel loads, which can lead to more damaging or larger-scale fires in the long term. Fire also increases opportunities for invasive species such as cheatgrass to spread, so fire suppression can indirectly limit this expansion.

Controlled burning may be prescribed to treat fuel buildup and can assist in the recovery of sagebrush habitat in some vegetation types. Re-seeding with native plants and long-term monitoring to ensure the production of cover and forage plants would assist vegetation recovery (NTT 2011).

Livestock grazing may have both beneficial and detrimental impacts on rangeland vegetation, depending on site-specific management (USFWS 2010). At unsustainable levels, grazing can lead to loss of vegetative cover, decreased plant litter, increased soil erosion, and reduced habitat quality for wildlife (Knick 2011; Connelly et al. 2004). When properly managed, grazing can be used as a tool to reduce fuel load, reduce spread of noxious weeds, and protect intact sagebrush habitat, and increase habitat extent and continuity (NRCS 2011). In areas meeting BLM Utah Public Land Health Standards, grazing practices coexist with healthy vegetation communities providing wildlife habitat. Grazing systems that aim to protect sagebrush and riparian ecosystems would allow more plant growth and reduce trampling and introduction of exotic species. Reducing or removing grazing in habitat areas would also reduce these effects

but could have unintended consequences of increasing fuel buildup or degrading vegetation quality over the long term. Range improvement projects often can be used to improve livestock distribution and set aside areas for rest from grazing, which would reduce the likelihood of impacts described above.

As described in the Vegetation section of **Chapter 4**, Environmental Consequences, energy development, including for oil and gas, natural gas, coal, and oil shale, could impact sagebrush habitats through direct disturbance and removal from well pad and access construction, seismic surveys, roads, power lines, and pipeline corridors, and indirectly from gaseous emissions, changes in water availability and quality, and human disturbance. The interaction and intensity of effects could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005).

The cumulative impact of the TransWest Express ROW is expected to be very low. A majority of the ROW will be reclaimed and therefore in the long-term, the proportional amount of cumulative disturbance would have a low impact on overall vegetation composition and health in the analysis area.

Travel management planning is a mechanism used to designate and close routes and proactively balance the demands for motorized recreation and access with protection of sensitive resources. By planning at the landscape scale, the BLM and Forest Service would be able to retain large expanses of sagebrush and manage impacts on vegetation from motorized vehicles (discussed in the Vegetation section of **Chapter 4**) through route designations and closures.

Alternative A

Under Alternative A, current management would continue in the planning area. There would be no designated PHMA or GHMA, and most GRSG habitat would remain open to new ROWs and mineral development to protect GRSG habitat. Grazing management would not specifically consider GRSG habitat needs, and vegetation management place as much prioritization on sagebrush protection, enhancement, and restoration. Fire could result in loss of sagebrush, which is slow to re-grow and susceptible to weed invasion post-fire. Planned ROW construction could increase fragmentation of vegetation, and lands and mineral developments would increase loss of sagebrush vegetation. However, some use restrictions would be implemented, which would protect vegetation in these areas from degradation or removal. Vegetation management and noxious weed control projects would benefit sagebrush ecosystems by removing invasive plants and promoting healthy vegetation communities. State and local efforts to protect GRSG would also benefit sagebrush ecosystems on state and private lands. Overall, Alternative A would lack the landscape-level management tools to reduce cumulative effects from past, present, and reasonably foreseeable future actions.

Alternative B

Under Alternative B, PHMA and GHMA would be designated as ROW exclusion and avoidance areas, respectively. Grazing management would be improved, which would reduce impacts on sagebrush vegetation. No ACECs would be established, but land disposals and acquisitions would focus on maintaining sagebrush acreage and connectivity. ROWs, access roads, and associated infrastructure planned according to **Table 5.2** would be sited outside PHMA under Alternative B, planned mineral exploration and development would be sited outside PHMA in

unleased areas, and conservation measures would be applied to valid existing rights. The vegetation management and restoration projects mentioned above would benefit the planning area in discrete locations. State and local efforts to protect GRSG would also benefit sagebrush ecosystems on state and private lands. Prescribed fires would be re-seeded and monitored to prevent invasive plants from establishing. As a result, the cumulative effects from past, present, and reasonably foreseeable future actions under Alternative B would be reduced compared with Alternative A.

Alternative C

Alternative C would provide more protection to GRSG habitat but would reduce management flexibility. Alternative C would establish ACECs in occupied habitat, and occupied habitat would be ROW exclusion areas and closed to mineral development and leasing. These provisions would protect vegetation from loss, fragmentation, and disturbance associated with surface-disturbing activities. In Alternative C1, grazing would be removed from occupied habitat, which would allow for greater herbaceous growth but could increase fuel loading and risk of wildfire, which would potentially degrade vegetation quality over the long term. Under Alternative C2, reduced grazing would likely reduce potential impacts from grazing described in the Vegetation section of **Chapter 4**. Reduced management flexibility could lead to inefficient or ineffective management at the site-specific scale when conditions may require alterations in management. As under the other alternatives, the vegetation management and weed prevention projects listed in **Table 5.2** would benefit vegetation health. State and local efforts to protect GRSG would also benefit sagebrush ecosystems on state and private lands. Alternative C would impose the most stringent restrictions on development of GRSG habitat, potentially restricting the ROW and mineral developments in **Table 5.2** thereby retaining the greatest extent of sagebrush vegetation. As a result, Alternative C would result in the greatest reduction in cumulative effects from past, present, and reasonably foreseeable future actions compared to all alternatives.

Alternative D

Alternative D is intended to preserve management flexibility and provide increased implementation guidance while protecting GRSG habitat. Management under Alternative D would increase vegetation protection compared to current management, but with more limited actions than Alternatives B or C. This alternative includes quantifiable treatment objectives to maintain 70 percent sagebrush. Increases in vegetation treatments to achieve this objective would improve sagebrush habitat and potentially reduce the amount of fire. Alternative D would establish ROW avoidance and exclusion areas, thereby reducing but not eliminating impacts from ROW development. Restrictions on mineral leasing and development would be greater than under Alternative A, but less stringent than Alternatives B and C. Prescribed burning and fuels management would take sagebrush vegetation into account. As under the other alternatives, the vegetation management and weed control plans listed in **Table 5.2** would benefit vegetation health. State and local efforts to protect GRSG would also benefit sagebrush ecosystems on state and private lands. Development restrictions in occupied habitat would retain existing vegetation, and rangeland improvements would improve vegetation quality on sagebrush acreage. As a result, the cumulative effects from past, present, and reasonably foreseeable future actions under Alternative D would be reduced compared with Alternative A, but to a lesser extent than Alternatives B and C.

Alternative E

Cumulative impacts from Alternative E would be similar to those described for Alternative D, though Alternative E would require less stringent use restrictions and would designate the least amount of mapped GRSG habitat as SGMAs/core areas of all the action alternatives. As a result, the cumulative impacts from past, present, and reasonably foreseeable future actions would be reduced compared with Alternative A, but to a lesser extent than the other action alternatives.

Proposed Plans

Cumulative impacts under the Proposed Plans would be similar to those described for Alternative D. Impacts would be reduced under the Proposed Plans due to the management of SFAs, implementation of RDFs and buffers, and mitigation requirements (**Appendix D**), which would apply to the development projects on BLM-administered and National Forest System lands in **Table 5.2**. As a result, the cumulative effects from past, present, and reasonably foreseeable future actions under the Proposed Plans would be reduced compared with Alternative A, but to a lesser extent than Alternatives B and C.

The Proposed LUPA would meet the COT report objectives for fire, invasive plants, range management, recreation, infrastructure, energy, and mining by targeting these threats in the LUPA and implementing management actions that specifically address these threats. Specifically, the following measures, which would be implemented under the Proposed LUPA, or are considered reasonably foreseeable future actions, would help meet the COT report objectives:

- Managing ROW exclusion and avoidance areas would help meet the COT report objective for infrastructure by limiting ROW/SUA development within PHMA. These actions would also help to meet the COT objectives for non-native, invasive plant species by reducing disturbances that promote the spread of weeds.
- Designating major and moderate oil and gas stipulations would limit development in PHMA, except where valid existing rights apply. In these areas, COAs would limit disturbance.
- Implementation of state conservation plans and/or state executive orders would help meet all COT report objectives, particularly on non-BLM and non-National Forest System lands. Applying a 5 percent disturbance limit (under the Wyoming and Montana GRSG plans/executive orders) would reduce impacts contributing to population declines and range erosion associated with multiple threats including energy, mining, and infrastructure.
- Removal of standing and encroaching trees within 100 meters (328 feet) of occupied leks and other habitats (e.g., nesting, wintering, and brood-rearing) would reduce the rate of pinyon-juniper incursion and help to maintain health native sagebrush plant communities.
- Continued implementation of the Natural Resource Conservation Service Sage-Grouse Initiative would help meet the COT objective for the threat of agriculture conversion, by securing conservation easements on private lands. Fence marking, implementing prescribed grazing systems, and vegetation seeding would help meet the COT objectives for range management structures, grazing, and non-native, invasive plant species.

5.10 OTHER SPECIAL STATUS SPECIES

Many past and present actions and conditions within the cumulative impact analysis area have affected and will likely continue to affect other special status species as described in the Other Special Status Species section of **Chapter 4**, Environmental Consequences. Reasonably foreseeable future actions that may affect other special status species include noxious weed treatments, conifer encroachment control efforts, and sagebrush habitat restoration projects. State and local efforts to protect GRSG would include habitat improvement projects on state and private lands. These improvement efforts would expand the extent and increase the quality of habitat for many special status plant and animal species where they overlap with GRSG habitat; however, these gains would be supplanted, at least in part, by impacts outside of GRSG habitat resulting from energy development, especially oil and gas development near the Uintah and Carbon population areas. Additionally, future actions including transmission line construction, mineral development, and livestock grazing are expected to reduce available habitat for other special status plant and animal species.

Even though the TransWest Express ROW has been exempt from the any GRSG restrictions and mitigation, there is not expected to be an increased cumulative impact from the TransWest Express ROW. Mitigation measures and BMPs outlined in the TransWest Express Final EIS would prevent impacts on special status species and therefore negligible cumulative impacts are expected from the exemption of this ROW.

Alternatives Analysis

Over the long term, cumulative impacts from future oil and gas development actions described in **Table 5.2** would increase the number of surface acres disturbed by more than 600,000 acres in the Uintah and Carbon population areas alone. Data provided in **Table 5.2** indicate approximately 450,000 acres of future habitat improvement projects are expected throughout the Utah Sub-region. State and local efforts to protect GRSG include GRSG habitat improvement projects on state and private lands. These planned improvements, particularly in GRSG habitat, would increase habitat for other special status species including Utah prairie dog and black-footed ferret, which also inhabit sagebrush ecosystems. However, areas scheduled for future energy development or other surface disturbing activities would remove a greater proportion of potential habitat for special status species in the planning area. If applied to protect special status species, lease stipulations or similar COAs for development activities would minimize disturbance impacts either year-round or during the season of use, depending upon the lease stipulation or COA. Where not applied or where applied seasonally, the habitat would incur some level of disturbance and fragmentation in those areas, even where other mitigation measures are implemented.

Management under Alternative A would have the greatest cumulative impacts on other special status species including Utah prairie dog and black-footed ferret because it provides the fewest considerations of ecological impacts in management decisions. The potential for impacts from development would be distributed throughout the planning area and could equally impact both species that rely on sagebrush and those that use sagebrush habitat. On the other hand, habitat improvement projects proposed throughout the planning area would incidentally benefit other special status species that rely on habitats being treated. Such effects would be experienced under all alternatives.

Management under Alternatives B, C, D, and E, and the Proposed Plans would include limitations on surface disturbing activities, such as ROW and mineral development, therefore reducing the potential for long-term cumulative impacts on special status species' habitat. Such activities would likely be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, which would incur some level of disturbance and fragmentation of other special status species' habitat in those areas, even where mitigation measures are implemented. Species that overlap sagebrush habitat would be impacted more than sagebrush obligate species and the magnitude of the impact would be the greatest in previously undisturbed areas. Impacts would be felt the most under Alternatives B and C where surface development would be precluded in all or part of mapped occupied GRSG habitat.

Under Alternatives D and E and the Proposed Plans, development activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, although not to the same extent as under Alternatives B and C.

5.11 FISH AND WILDLIFE

Many past and present actions and conditions within the cumulative impact analysis area have affected and will likely continue to affect fish and wildlife as described in the Fish and Wildlife section of **Chapter 4**, Environmental Consequences. Reasonably foreseeable future actions that may affect fish and wildlife in the future include vegetation and noxious weed treatments, conifer encroachment control efforts in sagebrush ecosystems, and GRSG habitat restoration projects. State and local efforts to protect GRSG include habitat improvement projects on state and private lands. These improvement efforts would expand the extent and increase the quality of habitat for many fish and wildlife species that inhabit sagebrush ecosystems; however, these gains would be supplanted, at least in part, by impacts resulting from energy development, especially oil and gas development in the Uintah and Carbon population areas. Additionally, future actions including transmission line construction and mineral development are expected to reduce available habitat for fish and wildlife species.

The cumulative impact from the exemption of the TransWest Express ROW is expected to be relatively low due to the overall population viability in these areas and the nature of the ROW. There are also many mitigation measures and BMPs in the Final EIS for that project that would also lessen the chance of cumulative impacts on fish and wildlife in GRSG habitat along the TransWest Express ROW.

Alternatives Analysis

Over the long term, cumulative impacts from future oil and gas development actions described in **Table 5.2** would increase the number of surface acres disturbed by more than 600,000 acres in the Uintah and Carbon population areas alone. Data provided in **Table 5.2** indicate approximately 450,000 acres of future habitat improvement projects are expected throughout the Utah Sub-region. State and local efforts to protect GRSG include habitat improvement projects on state and private lands. These planned improvements, particularly in GRSG habitat, would increase habitat for fish and wildlife species that live in and adjacent to sagebrush ecosystems. Suitable big game crucial winter and fawning/calving habitats that overlap with future restoration efforts would have increased habitat quality and would result in increases to these populations in the long term. Such effects would be experienced under all alternatives.

Areas scheduled for future energy development or other surface disturbing activities would remove a greater proportion of potential habitat for fish and wildlife species in the planning area. Future oil and gas development in the Uintah and Carbon population areas would occur in habitats used extensively by elk for crucial winter habitat and mule deer for crucial winter and fawning/calving habitat (see the Fish and Wildlife section of **Chapter 4**). Lease stipulations or similar COAs for development activities would minimize disturbance impacts on big game during the season of use but the habitat would incur some level of disturbance and fragmentation in those areas, even where mitigation measures are implemented.

Management under Alternative A would have the greatest cumulative impacts on fish and wildlife species because it provides the fewest considerations of ecological impacts in management decisions. The potential for impacts from development would be distributed throughout the planning area and could impact fish and wildlife species equally.

Management under Alternatives B, C, D, and E would include limitations on surface disturbing activities, such as ROW and mineral development, therefore reducing the potential for long-term cumulative impacts on fish and wildlife species' habitat. Such activities would likely be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, which would incur some level of disturbance and fragmentation of other special status species' habitat in those areas, even where mitigation measures are implemented. Species that overlap sagebrush habitat would be impacted more than sagebrush obligate species and the magnitude of the impact would be the greatest in previously undisturbed areas. Impacts would be felt the most under Alternatives B and C where surface development would be precluded in all or part of mapped occupied GRSG habitat.

Under Alternatives D and E, development activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, although not to the same extent as under Alternatives B and C.

Cumulative impacts under the Proposed Plans would be similar to those described for Alternative D. Impacts would be reduced under the Proposed Plans due to the management of SFAs, implementation of RDFs and buffers, and mitigation requirements (**Appendix D**), which would apply to the development projects on BLM-administered and National Forest System lands in **Table 5.2**. As a result, the cumulative effects from past, present, and reasonably foreseeable future actions under the Proposed Plans would be reduced compared with Alternative A, but to a lesser extent than Alternatives B and C.

5.12 WILD HORSES AND BURROS

The cumulative impact analysis area used to analyze cumulative impacts on wild horse and burros is the planning area. Wild horses and burros only occur on BLM-administered and National Forest System lands within the planning area so impacts are expected to be limited to those actions originating within the area.

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect wild horse and burro management are actions that change forage availability, range conditions, access to water sources, and barriers to movement. In addition, actions that result in indirect disturbance to

wild horses include recreational activates development for minerals, energy and transmission. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

The cumulative impact on wild horses and burros would be the greatest under Alternative A where anthropogenic disturbances in the planning area that impact forage availability, range conditions, access to water sources, and barriers to movement would be the most dispersed. Habitat improvement projects throughout the planning area, while not aimed at improving forage availability specifically for wild horses and burros, would provide an incidental benefit where such projects overlap HMAs. This type of impact would be experienced under all alternatives.

Management under Alternatives B, C, D, and E, and the Proposed Plans would include limitations on surface disturbing activities, such as ROW development and mineral development, therefore reducing the potential for long-term cumulative impacts on wild horses and burros in the decision area. Such activities would likely be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat. Where development is pushed to HMAs outside of mapped occupied GRSG habitat, some level of disturbance and fragmentation would be incurred, even where mitigation measures are implemented. The impact would be felt the most under Alternatives B and C where surface development would be precluded in all or part of mapped occupied GRSG habitat. Under Alternatives D and E and the Proposed Plans, development activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat.

In addition, should management resources be concentrated in GRSG habitat, HMAs not within GRSG habitat may have fewer resources devoted. In general, actions to improve land-health for GRSG are also likely to improve rangelands for wild horses resulting in a cumulative improvement in ability to meet AMLs in those areas.

5.13 CULTURAL RESOURCES

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect cultural resources are transmission lines, transportation/travel planning and development projects, vegetation treatments (including noxious weed and fuels treatments), minerals and energy exploration, energy development projects (including oil and gas field development and infrastructure projects), and grazing allotment improvements (including fenceline construction and water developments). There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

Under Alternative A, all of the impacts described above in the direct/indirect effects section would continue to occur on into the future. With the trends of increasing oil and gas development projects, transmission lines, travel management planning and projects, and renewable energy developments, there would be continuing and increased impacts on cultural resources. Impacts would be spread across the landscape, and cultural resources located in areas outside of GRSG habitat would also be affected. The range of laws that require federal

agencies to protect and preserve cultural resources on lands under federal agency jurisdiction would provide some mitigation to the impacts; however, actions occurring on nonfederal lands (whether private or state jurisdiction) would have less protections, resulting in increased magnitude and severity of impacts in these areas.

Under the action alternatives and the Proposed Plans, the types of protections noted in the direct/indirect analysis that extend to future projects that could occur in the planning area would provide long-term beneficial effects on cultural resources (e.g., protecting resources in exclusion and closed areas, enhancing vegetation communities that would lessen erosion potential, etc.). Protections for GRSG habitat could indirectly impact cultural resources outside of the planning area if activities restricted in GRSG habitat are relocated to areas outside of the planning area that have fewer restrictions. Similar to effects under Alternative A, reasonably foreseeable actions occurring on nonfederal lands would continue to impact cultural resources and would have fewer protections than under the action alternatives, resulting in increased magnitude and severity of impacts in these areas.

As stated previously, for federal undertakings under all alternatives, NEPA and Section 106 consultation would continue with the State Historic Preservation Officer and Native American groups to identify cultural resources and address potential impacts. Through this process, effects would be minimized or eliminated.

5.14 VISUAL RESOURCES

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect visual resources include transmission line projects, coal extraction, gravel extraction, tar sands extraction, fluid mineral development, the water pipeline project, prescribed burns, hydroelectric project, electronic sites, fuel breaks, timber harvest, and route construction. There is no additional cumulative impact anticipated from the TransWest Express ROW exception. The TransWest Express Final EIS has mitigation measures and BMPs addressing visual resources.

Alternatives Analysis

The incremental contribution to the cumulative impacts on visual resources under all action alternatives is expected to be less or the same as those under current management (Alternative A). The potential for changes in visual quality would be greatest under Alternative A because of fewer restrictions on anthropogenic disturbances. Conversely, the implementation of increased restrictions on anthropogenic activities to protect GRSG under Alternative C would result in the fewest impacts on visual quality. Alternatives B, D, and E, and the Proposed Plans would have slightly less restrictions on surface disturbing activities and would therefore result in slightly less protections of visual quality than Alternative C. The Proposed Plans would further minimize long-term cumulative visual impacts by establishing a 3 percent disturbance cap.

5.15 WILDLAND FIRE MANAGEMENT

The cumulative impact analysis area used to analyze cumulative impacts on wildland fire ecology and management is the planning area.

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect wildland fire ecology

and management are vegetation management projects, projects that impact ability to respond to wildland fire, projects that would increase ROWs and energy and mineral development, and projects that would increase access to land and consequently increase the risk of human-caused ignitions. State and local efforts to protect GRSG include plans to control and suppress fires on private and state lands, which would also help protect sagebrush from wildfire.

Wildland fires in the Utah Sub-region have been frequent in the past, with over 1,500 wildfire starts documented on occupied GRSG habitat on BLM-administered and National Forest System lands in the planning area during the past 20 years; approximately 44 percent are attributed to human-caused ignition. Wildland fires are expected to increase in the future due to reoccurring and increasingly severe drought conditions caused by climate change as well as increasing development and human presence. This could impact wildland fire management through and the increased need for suppression activities and the increased costs of responding to wildfires.

Past fuels treatments within the planning area, including hazardous fuels reduction, prescribed fires, chemical and mechanical treatment, and seeding, will continue and potentially increase in the future.

ROWs and the associated development may increase the risk of human-caused ignitions due to vehicular travel to and from the site, construction, maintenance, and operation of the facilities. However, the development allowed under these authorizations would result in surface-disturbance and maintenance of areas of cleared vegetation to protect the facility in the event of a fire. This modification of the composition and structure of vegetation communities near developed areas could be used as anchor points for fire lines and could also be used as fuel breaks. Similarly, energy and mineral development, particularly that include surface disturbing actives, could also contribute to human-caused ignitions in the planning and would likely continue to do so in the future.

In terms of fire risk, for the TransWest Express ROW exception, there is the potential for additional wildland fire risk for certain vegetation types. For sagebrush shrubland, these would typically be manifest in higher fine fuel loading from invasive annual grasses in sagebrush shrub, with attendant increases in fire intensity and frequency. This may not represent significant risk to large transmission lines with steel structures like TransWest Express and therefore the cumulative impact from this ROW exception would be unlikely.

As the global effects of climate change continue into the future, the likelihood of natural, unplanned ignition within the planning area may increase due to the irregular weather patterns, increased likelihood of storms, and drought. The more restrictive alternatives, as climate change is a global process, impacts on climate change from management actions related to this project would be negligible and would be similar across all alternatives.

Alternative A

Under Alternative A, trends as described above would continue to affect fire management in the planning area.

Alternative B

Under Alternative B, more restrictions on land uses as compared with Alternative A may reduce new sources of ignition and decrease the risk of human-caused ignitions in GRSG habitat. Therefore, although some of these restrictions may limit the ability of the wildland fire management program to implement certain preventative treatment methods, other restrictions (e.g., closures to new mineral development) may also lessen the occurrence of fires in the first place and may result in fewer fires in the future for the cumulative impact analysis area as a whole.

Alternative C

Under Alternative C, treatments to prevent or reduce the severity of wildland fire may be prohibited. There is the possibility that planning decision would result in changes in fuels level or changes to management options for fuels treatments and wildfire suppression. Drought may affect vegetation health, which consequently makes vegetation more vulnerable to wildland fires. These cumulative circumstances may result in a greater need for flexibility in access to the planning area and in fire-suppression activities. The management actions under Alternative C that inhibit responses to and preventative treatments for wildland fire may struggle to meet the growing need for this flexibility in the future.

Alternative D

Under Alternative D, there would be greater flexibility in fuels management options compared with Alternative A. This would reduce the potential for changes in fuel levels and reduce the cumulative fire risk in the planning area.

Alternative E

Under Alternative E, the emphasis on fire risk reduction in the GRSG habitat and efforts to coordinate with local and state governments would result in a cumulative improvement in response capabilities to wildland fire.

Proposed Plans

Under the Proposed Plans, restrictions on anthropogenic development in GRSG habitat combined with site specific monitoring and implementation measures for fire operations and fuels management would result in improved vegetation and reduced cumulative fire risk in the planning area.

5.16 WILDERNESS CHARACTERISTICS

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect wilderness characteristics are wildland fires, wildland fire management activities, energy development, mining, noxious weed invasion, increased recreational demands, and road construction. Impacts on wilderness characteristics would not occur in natural areas and where management actions governing other resources complement wilderness characteristics. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

Many past, present, and reasonably foreseeable actions have impacted or have the potential to impact lands with wilderness characteristics. For example, continued residential development in

the planning area will likely increase visitor use on BLM-administered lands including natural areas and lands with wilderness characteristics, potentially impacting wilderness characteristics by reducing opportunities for solitude. Development of energy and minerals resources could introduce sights, noises, and infrastructure in or adjacent to lands with wilderness characteristics, which could impair the feeling of solitude and degrade naturalness. In addition, vegetation management activities on public and private lands could alter landscape appearance and setting in the short and long term, protecting or degrading wilderness characteristics depending on the activity.

All action alternatives and the Proposed Plans would include limitations on surface disturbing activities, such as ROW development and mineral development in the decision area; such activities would likely be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat. Where development is displaced to lands with wilderness characteristics, impacts of the type and nature previously described could be incurred.

The potential for the push effect to impact lands with wilderness characteristics outside of the decision area would be the lowest under Alternative A where the potential for impacts is distributed throughout lands with wilderness characteristics. On the other hand, the potential for the push effect to impact lands with wilderness characteristics outside of the decision area would be the highest under Alternatives B and C where surface-disturbing activities would be prohibited in all or portions of mapped occupied GRSG habitat. Under Alternatives D and E and the Proposed Plans, development activities may be pushed to nonfederal lands or to federal lands outside of mapped occupied GRSG habitat, although not to the same extent as under Alternatives B and C.

5.17 LIVESTOCK GRAZING/RANGE MANAGEMENT

The cumulative impact analysis area used to analyze cumulative impacts on range management is the planning area. Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect range management are mainly those that reduce available grazing acreage, the level of forage production in those areas, or inhibit livestock improvements, such as water development or fences. Generally, livestock use has decreased over the past 100 years in the region.

Past and present actions that have affected livestock grazing include human-caused surface disturbances such as those associated with mineral, transmission and energy development, recreation, and historic grazing practices. In addition, reallocation of public land use such as seen in the creation of water storage because of drought and allocation of forage for wildlife use rather than livestock and protection for federally listed species has impacted levels of permitted use. Trends of increasing urban development have resulted in the replacement of ranches adjacent to federal lands with subdivisions; these ranches serve as the required base property and because of redevelopment associated AUMs may go unused. Finally, changes in habitat due to historic fire suppression and climate change have resulted in encroachment of juniper and other trees into grasslands decreasing available forage.

Future actions affecting livestock grazing are similar to present actions, and include any restriction on grazing management associated with future species listings under the ESA and additional changes to forage due to continued drought or climate change. Projects that increase

cumulative human disturbance in grazing areas could also indirectly impact grazing by increasing weeds and invasive species and by disturbing or displacing livestock. Conversely, planned vegetation improvement projects in the planning area, as described in **Table 5.2** may result in exclusion of grazing from site-specific areas temporarily, but would generally improve rangeland conditions in the long term through reduction of the encroachment of juniper into grasslands and, potentially, though improvement of vegetation condition. State and local efforts to protect GRSG would include efforts to address improper livestock grazing on state and private lands. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

The incremental contribution of the project to cumulative impacts on range management would parallel the impacts of the alternatives as described in the Livestock Grazing section of **Chapter 4**, Environmental Consequences; under Alternatives B, D, and E, and the Proposed Plans, management actions to protect GRSG and GRSG habitat would result in no direct reduction in permitted AUMs as compared with Alternative A, but may result in an indirect reduction in grazing on federal lands due to increased restriction and related costs, particularly from restrictions on structural improvements in Alternative B. Restrictions on development within GRSG habitat under Alternatives B, D, and E, and the Proposed Plans would reduce conflicts with livestock; however, the numerous development projects proposed in GRSG habitat (see **Table 5.2**) would increase conflicts with livestock. Therefore, there may be little change in the amount of conflicts with livestock in GRSG habitat within the planning area under Alternatives B, D, and E, and the Proposed Plans. Vegetation treatments under Alternatives B, D, and E, and the Proposed Plans would enhance the impacts of planned vegetation treatments listed in **Table 5.2** on livestock grazing in the planning area. Grazing may be more restricted in areas where treatments occur, but forage would likely improve in the long term.

The greatest contribution to cumulative effects on livestock grazing would be seen in Alternative C. Under Alternative C1, all 329,521 AUMs on BLM-administered lands and 265,373 AUMs on National Forest System lands would be eliminated. Livestock grazing is likely to shift from lands within the decision area to BLM-administered and National Forest System lands outside GRSG habitat and to private and state lands. This management would increase grazing pressure on those lands and would ultimately reduce the amount of land available for grazing in the planning area. Where grazing pressure increased in areas with proposed development projects listed in **Table 5.2**, conflicts with livestock would increase. In some cases, where ranches are dependent on public lands for grazing, reduction or elimination of grazing of AUMs on federal lands in GRSG habitat may result in permittees going out of business. Permittee loss of business could result in the sale of private grazing lands and ranches and the subsequent development of these lands for other purposes.

The incremental contribution to cumulative effects on livestock grazing under Alternative C2 would be less than that under Alternative C1 because AUMs would be reduced but not eliminated in GRSG habitat. Reduction to 197,713 authorized AUMs on BLM-administered lands and 159,224 AUMs on National Forest System lands would cause similar shifts in livestock grazing to those described under Alternative C1, but these shifts would not be as dramatic. Therefore, grazing pressure on lands outside the decision area (and resulting conflicts with

planned development projects) would not increase as much. A gradual decrease in permitted grazing level has potential to occur under Alternatives B, D, and E, and the Proposed Plans should current grazing management need to be adjusted to meet GRSG vegetation requirements. Impacts would be as discussed for Alternative C, but at a reduced scale.

Vegetation treatment projects under Alternative C2 would increase the impacts of planned vegetation treatment projects listed in **Table 5.2,** as described under Alternatives B, D, and E, and the Proposed Plans. However, the incremental contribution to cumulative impacts from vegetation treatments on livestock grazing would differ from those alternatives. Temporary restrictions on grazing in areas with vegetation treatments would have less of an impact under Alternative C2 because grazing pressure within the decision area would already be reduced. However, forage quality would likely increase more dramatically in the long term under Alternative C2 due to reduced grazing pressure.

5.18 RECREATION

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect recreation include large electrical transmission lines, pipeline projects, and similar linear ROW development projects that conflict with recreation opportunities. In addition, coal extraction, gravel extraction, tar sands extraction, and oil and gas development would impact recreation opportunities by conflicting with recreation users and through the creation of noise and visual disruptions the affect user experiences. However, an influx of workers for energy development increases the number of publics who may use the recreational facilities. State and local efforts to protect GRSG would include efforts to address recreational activities, particularly OHV uses, that conflict with GRSG on state and private lands. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Reasonably foreseeable trends that would result in cumulative impacts on recreation include continued growth patterns in demand for all recreation experiences, increased demand for close-to-home recreation opportunities for local residents, continued and increased visitation from a growing regional population, and increased popularity of adjacent public lands.

Alternatives Analysis

The degree of conflict with recreation users and creation of barriers to recreation opportunities would be greatest under Alternative A because of fewer restrictions on conflicting activities. The implementation of increased restrictions to protect GRSG under Alternative C, such as ROW exclusion, undesignation of utility corridors, and closure to mineral development would result in the fewest conflicts with recreation; however, Alternative C would add the most restrictions on recreation activities and development. Alternatives B, D, and E, and the Proposed Plans would result in fewer restrictions on development activities with correspondingly greater conflicts with recreation than Alternative C; however, these alternatives would place also place fewer restrictions on recreation.

Because there is limited overlap between SRMAs and the decision area, the amount of targeted recreation within the decision area is small compared with the amount of targeted recreation in the remainder of the planning area. Therefore, the incremental contribution of the management under this LUPA/EIS to cumulative impacts on recreation in the planning area will be minimal.

5.19 COMPREHENSIVE TRAVEL AND TRANSPORTATION MANAGEMENT

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect travel management are the result of management actions to close certain areas to motorized vehicle use or limit motorized travel to existing or designated routes. For example, the Forest Service has limited motorized travel to designated routes on all National Forest System land in the planning area. State and local efforts to protect GRSG would include efforts to address OHV uses that conflict with GRSG on state and private lands. Reasonably foreseeable trends that would result in cumulative impacts on travel and transportation include continued growth patterns in demand for OHV recreation experiences, continued and increased visitation from a growing regional population, and increased popularity of adjacent public lands. BLM policy requires field offices to undergo travel management planning, which includes route designation. Therefore, it is reasonably foreseeable that the BLM will complete the route designation process, taking into account the effect of routes on GRSG, and will close routes within the decision area in the future. Additionally, the State of Utah's plan for the protection of GRSG calls for avoiding, minimizing, or mitigating impacts from land uses on GRSG. This plan will likely result in prohibiting new route construction and/or closing routes on state and private lands within GRSG habitat. There are no additional cumulative impacts on comprehensive travel and transportation management anticipated from the TransWest Express ROW exception.

Alternatives Analysis

Under Alternative A, there would be no new restrictions related to GRSG habitat management and no change in cumulative impacts on travel management. Under Alternatives B, D, and E, and the Proposed Plans motorized travel would be limited to existing roads and trails in PHMA/mapped GRSG habitat in SGMAs/core areas, thereby reducing cross-country access on BLM-administered and National Forest System lands in those areas. New route construction may shift to areas outside PHMA/mapped GRSG habitat in SGMAs/core areas to compensate for reduced access within PHMA/mapped GRSG habitat in SGMAs/core areas. As a result, route density in population areas outside PHMA/mapped GRSG habitat in SGMAs/core areas could increase. However, existing Forest Service restrictions on new route on National Forest System lands throughout the planning area, combined with likely future restrictions on new routes and possible route closures on state, private, and BLM-administered land in GRSG habitat, would further reduce the area where new routes could be constructed in population areas. Additionally, route length in population areas could increase because new routes would need to circumvent PHMA/mapped GRSG habitat in SGMAs/core areas instead of passing through them. Again, impacts on route length could be compounded by restrictions on National Forest System land outside PHMA/mapped GRSG habitat in SGMAs/core areas, as well as restrictions and/or closures on state, private, and BLM-administered land throughout occupied habitat. Reductions in access and corresponding route density and length impacts in population areas would be greatest under Alternative C due to management that would close existing routes in portions of population areas, prohibit new road construction within 4 miles of active leks, and prohibit upgrading of existing routes in PHMA.

5.20 LANDS AND REALTY

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect lands and realty

include new electrical transmission line development projects like the TransWest Express 600 kV project designed to deliver energy generated at large-scale wind energy development sites in Wyoming and the Dakotas to large load centers, such as Las Vegas, in the southwest. Because Utah is located between generation sources and several load centers throughout the west, transmission lines such as those identified in **Table 5.2** would continue to cumulatively affect lands and realty in the planning area.

Alternatives Analysis

Impacts on lands and realty across alternatives are largely dependent on the number of acres where the BLM and Forest Service would exclude or avoid new ROW development. In occupied habitat, there are currently 27,600 acres of ROW exclusion. Under Alternatives B, C, and D, the amount of ROW exclusion would increase substantially. Under the Proposed Plans, net conservation gain requirements for GRSG habitat combined with buffer, tall structure, and RDF requirements would discourage new ROW development. Existing restrictions associated with the current land use pattern (e.g. state parks, national parks, national monuments, and US Department of Defense lands) currently present siting issues for interstate linear transmission facilities. Increases in the amount of ROW exclusion or avoidance measures would increase this challenge and could prevent future siting of transmission infrastructure through Utah. Because ROW exclusion and avoidance allocations prevent or discourage new ROW development, the resulting cumulative impact on the lands and realty program under Alternatives B, C, and D, and the Proposed Plans would be inability or reduced ability to accommodate new ROW infrastructure in GRSG habitat. See **Table 2.3**, Comparative Summary of Allocation Decisions of the Proposed Plan Amendments and Draft Alternatives, for ROW exclusion and avoidance acreages by GRSG habitat and ROW type.

Alternatives A and E would result in the fewest impacts on lands and realty from ROW exclusions, while Alternatives B, C, and D, and the Proposed Plans would result in varying degrees of restrictions on ROW development with C being the most restrictive. Conversely, limitations on mineral and renewable energy development under Alternatives B, C, and D, and the Proposed Plans would decrease demand for new ROWs to support those types of activities.

Under the adaptive management strategy for the Proposed Plans, if a hard trigger is reached within a BSU, high voltage transmission lines (greater than or equal to 100 kv) and major pipelines (greater than or equal to 24 inches) would be excluded from the area where the trigger is met. If this were to happen before a proposed transmission line is approved, it would affect the development of the proposed transmission line in the area where the trigger is met.

Limitations on land tenure adjustments, which allows the BLM opportunities to sell, exchange, or acquire lands to increase management effectively, would be the most restrictive under Alternative C and least restrictive under Alternatives A and E. Alternatives B and D and the Proposed Plans would allow disposal of lands within GRSG habitat under certain conditions, such as when land tenure adjustments would benefit GRSG.

Cumulative impacts on lands and realty are expected to be the highest under Alternative C, since it would place the most restrictions on development. In contrast, management under Alternative A would place the fewest restrictions on the lands and realty program and would therefore be expected to contribute the least to cumulative impacts on lands and realty.

Management under Alternatives B, D, and E, and the Proposed Plans would place restrictions on development, but to a lesser extent than under Alternative C. Management under Alternatives B, D, and E, and the Proposed Plans would therefore be expected to cumulatively contribute fewer impacts on lands and realty than Alternative C.

5.21 RENEWABLE ENERGY

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect renewable energy development are the construction of existing and proposed roads and transmission lines and construction of renewable energy projects outside the decision area. Road and transmission line projects would have a minor cumulative effect on renewable energy by increasing transmission routing options and possibly reducing project construction or implementation costs. Renewable energy development outside the decision area would cumulatively impact renewable energy by potentially reducing the need for or interest in renewable energy development in the decision area. There are no additional cumulative impacts anticipated from the TransWest Express ROW exception above those described in this section.

Because there has been little renewable energy development in mapped occupied GRSG habitat, and such development in mapped occupied GRSG habitat is not expected in the future, the incremental contribution of the management actions being considered in this LUPA/EIS to cumulative impacts on renewable energy would be minimal. Under Alternatives B, C, and D, and the Proposed Plans, approximately one quarter of the acres with developable wind resources in the planning area would become unavailable for utility-scale wind energy development because these areas would be managed as ROW exclusion. These alternatives would result in the greatest potential for impacts on the availability for wind energy development. However, there has been no serious interest in developing wind energy within mapped occupied GRSG habitat; therefore, while the management being considered under this LUPA/EIS could reduce future development opportunities in the planning area, the cumulative effect of these actions would be unlikely to result in a long-term decline in wind energy development compared to Alternative A.

Similar to wind energy, geothermal development in the planning area is not expected to be cumulatively impacted by the management actions being considered in this LUPA/EIS. As discussed in the Renewable Energy section of **Chapter 4**, Environmental Consequences, the reasonably foreseeable potential for geothermal development in the decision area would not be impacted under any alternative. Because there would be no direct or indirect effects on geothermal development in the decision area, there would be no cumulative effects on geothermal development in the planning area.

5.22 MINERALS

5.22.1 Fluid Minerals

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect fluid minerals are existing and planned fluid mineral development projects outside the decision area.

The management actions proposed under this LUPA/EIS would cumulatively impact fluid mineral development through surface use restrictions (e.g., closures, and NSO, CSU, and TL

stipulations) that ultimately would decrease the amount of oil and gas development in the planning area during the planning period. Closures and surface use restrictions, such as NSO stipulations, could also cause an operator to move to nearby private or state land if similar resources are available and recoverable with no such restrictions. However, the State of Utah's plan for the protection of GRSG and most county plans call for avoiding, minimizing, or mitigating impacts from land uses on GRSG. These plans would likely result in some restrictions on fluid mineral development on state and private lands within GRSG habitat. Additionally, if new roads or pipelines must cross federal lands to access the state and private lands, and those federal lands are managed as ROW exclusion, the state or private lands may not be developed due to the inability to transport resources to and from the well. As discussed in the Fluid Minerals section of **Chapter 4**, Environmental Consequences, the existing oil shale White River Research, Development, and Demonstration lease would not be impacted by new stipulations or closures implemented as part of this LUPA. However, it could be impacted by application of COAs and conservation measures or by access limitations caused by managing areas as ROW exclusion. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

Oil and Gas. The cumulative impact analysis area for fluid minerals is the planning area. **Table 5.40**, Projected Wells in Occupied Habitat, depicts the projections for new well development in occupied habitat (regardless of mineral ownership) over the next 15 years based on the management under each alternative.

Table 5.40
Projected Wells in Occupied Habitat

Alternative	Total Wells	Federal Wells	Nonfederal Wells
A	3,194	2,416	778
B	2,867	2,137	730
C	2,338	1,654	684
D	2,973	2,213	760
E	3,194	2,416	778
Proposed Plans	2,969	2,210	759

Management under Alternative B is projected to reduce new federal wells in the decision area by 12 percent compared with Alternative A, and total new wells in mapped occupied GRSG habitat, regardless of mineral ownership, would be reduced by 10 percent. Under Alternative C, new wells in the decision area are projected to be reduced by 32 percent compared with Alternative A, while total new wells in mapped occupied GRSG habitat, regardless of mineral ownership, would be reduced by 27 percent. Under Alternative D, new wells in the decision area are projected to be reduced by 8 percent compared with Alternative A, with total new wells in mapped occupied GRSG habitat, regardless of mineral ownership, reduced by 7 percent. Under Alternative E, no change in new wells is projected compared with Alternative A. Under the Proposed Plans, new wells in the decision area are projected to be reduced by 9 percent, while total new wells in mapped occupied GRSG habitat, regardless of mineral ownership, would be reduced by 7 percent.

As the analysis above shows, the management actions proposed under this LUPA/EIS that would reduce oil and gas activity in the decision area would likely have a proportional impact on oil and gas activity in mapped occupied GRSG habitat regardless of mineral ownership. Alternative C would have the greatest impact on oil and gas activity of all alternatives, reducing drilling of new federal wells by one-fourth.

Additional reductions in wells developed in the planning area may occur because of the restrictions to be applied by the State of Utah's plan for the protection of GRSG. These reductions would not vary by alternative and would likely have an impact similar to that of the management actions being considered in this LUPA/EIS.

5.22.2 Nonenergy Leasable Minerals

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect nonenergy leasables are existing and planned nonenergy leasable development projects outside the decision area.

The management actions proposed under this LUPA/EIS would cumulatively impact nonenergy mineral development through surface use restrictions (e.g., closures, and prohibitions on surface mining) that ultimately would decrease the amount of nonenergy leasable development in the planning area during the planning period. Closures and surface use restrictions could also cause an operator to move to nearby private or state land if similar resources are available with no such restrictions. However, the State of Utah's plan for the protection of GRSG and most county plans call for avoiding, minimizing, or mitigating impacts from land uses on GRSG. These plans will likely result in restrictions on nonenergy leasable mineral development on state and private lands within GRSG habitat. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

The cumulative impacts analysis area for nonenergy leasable minerals is the planning area. **Table 5.41**, Nonenergy Leasable Development Potential in the Planning Area, shows the acres of gilsonite, phosphate, and sodium in the planning area by occurrence or level of potential (high, moderate, or low).

Table 5.41
Nonenergy Leasable Development Potential in the Planning Area

Mineral Potential and Occurrence	Acres
Gilsonite Potential	**644,100**
High	71,900
Moderate	340,200
Low	232,000
Phosphate Potential	**1,126,600**
High	51,100
Moderate	48,300
Low	1,027,200
Sodium Occurrence	**7,559,400**

Source: BLM 2012d

Gilsonite. Under Alternatives A, B, D, and E, and the Proposed Plans, all acres with gilsonite development potential in the planning area would be open to leasing. Under Alternative C, 12,400 acres (17 percent) of minerals with high gilsonite development potential in the planning area would be closed to leasing. These limitations would reduce the amount of future gilsonite development within the planning area. Because the planning area contains the only gilsonite deposit in the world, gilsonite supplies worldwide would be impacted under Alternative C.

Phosphate. Under Alternatives A and E, all acres with high phosphate development potential in the planning area would be open to leasing. Under Alternatives B and C and the Proposed Plans 42,700 (84 percent) of minerals with high phosphate development potential in the planning area would be closed to leasing. Under the Proposed Plans new leasing could occur under certain conditions, such as when the lease is contiguous with existing operations. Under Alternative D, 9,700 acres (13 percent) of minerals with high phosphate development potential in the planning area would be closed to leasing, and 33,100 acres (65 percent) would be closed to surface development but open to underground development.

The closures proposed under Alternatives B, C, and D, and the Proposed Plans are unlikely to contribute to additional cumulative impacts on overall phosphate development in the Western Phosphate Field. An estimated 80 percent of the phosphate resources in the Western Phosphate Field are located in Idaho (USGS et al. 1977, p. 1-22). Idaho is the only other state containing a portion of the Western Phosphate Field with active phosphate development. Because the active phosphate development areas in Idaho do not overlap with GRSG habitat, phosphate development in the Idaho portion of the Western Phosphate Field is not expected to be impacted by the management actions being considered in these LUPAs. Nationwide phosphate production is also unlikely to be impacted because over 85 percent of domestic phosphate is currently mined in Florida and North Carolina (USGS 2014).

Sodium. Under Alternatives A and E, all acres with sodium occurrence in the planning area would be open to leasing. Under Alternative B, 158,900 acres (2 percent) of minerals with sodium occurrence in the planning area would be closed to leasing. Under Alternative C and the Proposed Plans, 161,700 acres (2 percent) of minerals with sodium occurrence in the planning area would be closed to leasing. Under Alternative D, 24,300 acres (less than 1 percent) of minerals with sodium occurrence in the planning area would be closed to leasing. Currently there is no sodium development occurring in GRSG mapped occupied habitat and there is no interest in prospecting, leasing, or development. As such, there closing areas to leasing should have no cumulative impact.

If interest in sodium development is generated during the 20 year life of this LUPA, closure and surface restrictions could shift nonenergy leasable mineral development to nearby state or private lands as described at the beginning of this section, particularly under Alternatives B and C and the Proposed Plans, which would close the most acres with high nonenergy leasable mineral development potential in the planning area. However, the State of Utah's plan for the protection of GRSG may restrict nonenergy leasable mineral development on state and private land in mapped occupied GRSG habitat. Therefore, the incremental contribution of management under this LUPA/EIS to the cumulative effects on nonenergy leasable mineral development in the

planning area would be to further reduce the areas in the planning area where nonenergy leasable minerals could be developed.

5.22.3 Coal

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect coal are existing and planned coal development projects outside the decision area.

The management actions proposed under this LUPA/EIS would cumulatively impact coal development through restrictions on surface mining that ultimately could decrease the amount of coal development in the planning area during the planning period. Closures and surface use restrictions could also cause an operator to attempt to move to nearby private or state land if similar resources are available with no such restrictions. However, state, county, and private mineral resources are often fragmented and limited in extent. Additionally, the State of Utah's plan for the protection of GRSG calls for avoiding, minimizing, or mitigating impacts from land uses on GRSG. This plan may result in restrictions on coal development on state and private lands within GRSG habitat. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

The cumulative impacts analysis area for coal is the planning area. **Table 3.97**, Coal Development Potential, shows the acres of coal occurrence in the planning area by level of development potential (high, moderate, or low).

Under Alternatives A, D, and E, 87,100 acres (8 percent) of minerals with high coal development potential in the planning area would be unsuitable for surface mining. Restrictions on surface disturbance and timing of activities in PHMA/mapped GRSG habitat in SGMAs/core areas under Alternatives D and E could reduce coal development on federal mineral estate in those areas. Under Alternative B, 167,700 acres (15 percent) of minerals with high coal development potential in the planning area would be unsuitable for surface mining. Under Alternative C, 185,500 acres (17 percent) of minerals with high potential in the planning area would be unsuitable for surface mining. However, the Alton mine in the Panguitch Population Area is the only existing surface mine in the planning area. All planned underground coal operations in the planning area would not be impacted by management actions applicable to surface mining. However, these operations would be impacted by restrictions on surface disturbance and TL stipulations under the action alternatives and the Proposed Plans. These limitations could reduce the amount of future coal development in PHMA could shift development to nearby state or private minerals with similar resources. However, state, county, and private mineral resources are often fragmented and limited in extent. Additionally, the State of Utah's plan for the protection of GRSG may restrict coal development on state and private land in mapped occupied GRSG habitat. Therefore, the incremental contribution of management under this LUPA/EIS to the cumulative effects on coal development in the planning area would be to further increase the areas in the planning area where coal development would be restricted.

5.22.4 Locatable Minerals

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect locatable minerals are

existing and planned locatable mineral operations within the planning area but outside of the decision area. Locatable mineral resources are associated with the geological formations or units they are found within, which are typically localized and do not encompass large areas. Additionally, not all geological formations contain mineral resources, or mineral resources could be found only in a portion of a certain geological formation. To provide context for where interest in locatable mineral development is most likely within the planning area, the BLM has assessed the locatable mineral occurrence potential throughout the planning area (see **Section 3.21.4**, Locatable Minerals). Assessment of locatable mineral occurrence potential in the planning area allows impact analysis to focus on those areas withdrawn or recommended for withdrawal from locatable mineral entry that are actually likely to have locatable mineral resources and interest in their development. While areas outside of the Utah Sub-region may be recommended for withdrawal from locatable mineral entry because of decisions in other sub-regional LUPAs, expanding the cumulative impact analysis to include additional sub-regions would both dilute and inflate the impacts on locatable mineral development. Expansion of the cumulative impacts analysis area would dilute the impacts because the acres withdrawn or recommended for withdrawal across the GRSG range under the Proposed Plans would be minute compared to the total acreage of the range. On the other hand, expansion of the cumulative impacts analysis area would inflate the impacts because many of the acres withdrawn or recommended for withdrawal across the GRSG range do not actually have locatable mineral resources that would be impacted. While data on locatable mineral occurrence potential are available for the planning area, similar data are not available across the GRSG range. Therefore, adding up areas withdrawn or recommended for withdrawal from locatable mineral entry beyond the planning area without accounting for where such entry is foreseeable would provide a less accurate picture of the cumulative impacts on locatable mineral development.

The management actions proposed under this LUPA/EIS would cumulatively impact locatable mineral development through recommended withdrawals that ultimately could decrease the amount of locatable mineral development in the planning area during the planning period. Withdrawals could also cause an operator to move to nearby private or state land if similar resources are available with no such restrictions. However, the State of Utah's plan for the protection of GRSG calls for avoiding, minimizing, or mitigating impacts from land uses on GRSG. This plan may result in restrictions on locatable mineral development on state and private lands within GRSG habitat. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

The cumulative impacts analysis area for locatable minerals is the planning area. **Table 5.42**, Locatable Mineral Occurrence Potential in the Planning Area, shows the acres of locatable mineral occurrence in the planning area by level of potential (high or moderate).

Management under Alternative B would increase the number of acres with high locatable mineral occurrence potential withdrawn or recommended for withdrawal within the planning area by 287,600 acres (4 percent of the high potential acres in the planning area). Under Alternative C, the acres with high potential that would be withdrawn or recommended for withdrawal would increase by 334,000 acres (5 percent of high potential acres in the planning

Table 5.42
Locatable Mineral Occurrence Potential in the Planning Area

Development Potential	Acres
High	7,119,400
Moderate	41,087,950

Source: BLM 2012d

area). Under the Proposed Plans, the acres with high potential that would be withdrawn or recommended for withdrawal would increase by 1,800 acres (less than 1 percent of high potential acres in the planning area). If these acres were withdrawn, the areas with high locatable mineral potential that could be developed in the planning area would be reduced. Development could shift to nearby state or private minerals with similar resources. However, the State of Utah's plan for the protection of GRSG may restrict locatable mineral development on state and private land in mapped occupied GRSG habitat. Therefore, the incremental contribution of management under Alternatives B and C and the Proposed Plans of this LUPA/EIS to the cumulative effects on development in the planning area would be to further reduce the areas in the planning area where locatable minerals could be developed without restrictions. However, because a maximum of 5 percent of high potential locatable minerals the planning area would be withdrawn under the LUPA/EIS, the incremental contribution to cumulative impacts on locatable mineral development in the planning area will be limited. Alternatives D and E would result in no change in acres withdrawn or recommended for withdrawal in the planning area compared with Alternative A.

5.22.5 Mineral Materials

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect mineral materials are existing and planned mineral material development projects outside the decision area.

The management actions proposed under this LUPA/EIS would cumulatively impact mineral material development through closures to mineral material disposal that ultimately could decrease the amount of mineral material development in the planning area during the planning period. Closures could also cause pits to move to nearby private or state land if similar resources are available. However, the State of Utah's plan for the protection of GRSG calls for avoiding, minimizing, or mitigating impacts from land uses on GRSG. This plan will likely result in restrictions on or closures to mineral material development on state and private lands within GRSG habitat. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

The cumulative impacts analysis area for mineral materials is the planning area. The planning area contains 19,719,400 acres of mineral material occurrence. Under Alternatives A and E, 30,600 acres (less than 1 percent) of minerals in the planning area with mineral material occurrence would be closed to mineral material disposal. Under Alternative B, 748,200 acres (4 percent) of mineral material occurrence in the planning area would be closed, and under Alternative C,

1,305,800 acres (7 percent) would be closed. Under Alternative D, 96,000 acres (less than 1 percent) of minerals in the planning area with mineral material occurrence would be closed to disposal, and another 650,100 acres (3 percent) would be closed to commercial disposal but open to noncommercial disposal. As a result, under Alternative D, 18,973,300 acres (96 percent) of mineral material occurrence in the planning area would be open to both commercial and noncommercial disposal. Under the Proposed Plans, 1,196,900 acres (6 percent) of mineral material occurrence in the planning area would be closed.

These closures could reduce the amount of future mineral material development in the planning area or could shift development to nearby state or private minerals with similar resources. However, the State of Utah's plan for the protection of GRSG would likely restrict mineral material development on state and private land in mapped occupied GRSG habitat. Therefore, the incremental contribution of management under this LUPA/EIS to the cumulative effects on mineral material development in the planning area would be to further reduce the areas in the planning area where mineral materials could be developed without restrictions. However, because a maximum of 6 percent of areas with mineral material occurrence in the planning area would be withdrawn under the LUPA/EIS, the incremental contribution to cumulative impacts on mineral materials will be limited.

5.22.6 Oil Shale and Tar Sands

Under all alternatives, the greatest cumulative impact on oil shale and tar sands development other than the management being considered as part of this LUPA would be from the ROD for the Oil Shale and Tar Sands Programmatic EIS (BLM 2013). The ROD closed all of the federal mineral estate in mapped occupied GRSG habitat in Utah to oil shale and tar sands leasing except for a the portion of the White River Oil Shale Research, Development, and Demonstration Preference Right Leasing Area overlapping habitat (2,320 acres) and the pending tar sands lease in the Asphalt Ridge Special Tar Sands Area (2,120 acres). The White River Oil Shale Research, Development, and Demonstration site and Preference Right Leasing Area also extends beyond mapped occupied GRSG habitat and includes a total of 160 acres of the Research, Development, and Demonstration site and another 4,690 acres of preference right leasing area. The Asphalt Ridge Special Tar Sands Area also includes minerals owned by state, private, and tribal entities. The total acreage in the Asphalt Ridge Special Tar Sands Area, regardless of ownership, is 39,100 acres. Approximately 16,200 acres of state lands are leased for tar sands development in the Special Tar Sands Area, and an existing tar sands strip mine and processing plant are located on private land in the area.

The management under Alternatives A and E would not cumulatively impact oil shale and tar sands development in the planning area. Under Alternative B, 2,320 acres (49 percent) of the White River Oil Shale Research, Development, and Demonstration preference right leasing area and all 2,120 acres of the pending federal tar sands lease (5 percent of the total acreage in the Asphalt Ridge Special Tar Sands Area, regardless of ownership) would be within areas managed as ROW avoidance. Under Alternative D, portions of these acreages within 1 mile of an occupied lek would be within areas managed as ROW avoidance. While this management would not prohibit development of the leases, it could make the leases less economic to develop. Under Alternative C, 2,320 acres (49 percent) of the White River Oil Shale Research, Development, and Demonstration preference right leasing area and all 2,120 acres of the

pending tar sands lease (5 percent of the total acreage in the Asphalt Ridge Special Tar Sands Area, regardless of ownership) would be in PHMA and subject to a 3 percent disturbance cap. The Uintah Population Area, where the White River Oil Shale Preference Right Lease Area is located, is currently just under the 3 percent disturbance cap. New development on federal or non-federal mineral estate could push the area over the cap and reduce opportunities for new surface disturbance in this portion of the Preference Right Lease Area until areas are reclaimed to the point where disturbance is below the threshold. Additionally, the area surrounding those leases would be managed as ROW exclusion. While these measures would not prohibit development of the leases, they could make the leases less economic to develop. If the leases were not developed because of management under Alternative C, the total development of federal oil shale and tar sands resources in Utah would decrease compared with Alternative A. Under the Proposed Plans, 2,320 acres (49 percent) of the White River Oil Shale Research, Development, and Demonstration preference right leasing area and all 2,120 acres of the pending tar sands lease (5 percent of the total acreage in the Asphalt Ridge Special Tar Sands Area, regardless of ownership) within GHMA would be subject to RDFs, lek buffers, and net conservation gain requirements, which could impact oil shale and tar sands development by restricting new surface development.

Under all alternatives, oil shale and tar sands development could continue to occur on federal mineral estate in Utah outside of mapped occupied GRSG habitat in areas designated as open by the Oil Shale and Tar Sands Programmatic EIS. Oil shale and tar sands development could also continue to occur on state, private, and tribal mineral estate.

5.23 Special Designations

5.23.1 Areas of Critical Environmental Concern and Zoological Areas

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect ACECs/Zoological Areas (existing or new) are any actions that would impact the GRSG habitat health for which the ACEC/Zoological Area would be established or, for existing ACECs, actions that would impact the relevant and important value(s) for which the existing ACEC was designated. Such actions include surface-disturbing activities, wildland fires, increased recreational demands, and climate change. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

For a detailed discussion of cumulative impacts on the 13 proposed ACECs and Zoological Areas to protect GRSG habitat under Alternative C, see the Special Status Species – Greater Sage-Grouse and Vegetation sections of **Chapter 4**, Environmental Consequences.

Cumulative impacts on existing ACECs under the various alternatives and the Proposed Plans could result from non-BLM actions and decisions on lands next to ACECs. However, the management associated with the existing ACECs was developed to address the pertinent threats and protect and prevent the existing ACEC values from irreparable damage. It is anticipated that impacts on the relevant and important values of existing ACECs would be due

to actions proposed in this LUPA/EIS, which would provide protection to the values present. These protections would be greatest under Alternatives B and C.

5.23.2 Wilderness Study Areas

Because the project would have no direct or indirect impacts on WSAs, cumulative impacts are not discussed. See BLM NEPA Handbook H-1790-1, Section 6.8.3.1.

5.23.3 Other Special Designations

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect national historic trails are increased recreational demands, energy development, and ROW location, which would put additional pressure on trails.

Because the project would have no direct or indirect impacts on Grand Staircase-Escalante National Monument or Flaming Gorge National Recreation Area, cumulative impacts are not discussed. See BLM NEPA Handbook H-1790-1, Section 6.8.3.1. There is no additional cumulative impact anticipated from the TransWest Express ROW exception.

Alternatives Analysis

Management of national historic trails in the planning area is coordinated with the National Park Service and local nonfederal partners. The continued collaboration with these partners in managing the trails in accordance with the comprehensive management plan (National Park Service 1999) could decrease the potential for degradation and assist in the preservation of natural, cultural, and historic trail resources.

The actions and activities considered in this cumulative effects analysis would not result in the inability of the BLM and Forest Service to provide public access to national trails. However, these actions and activities would alter scenic, natural, and cultural features of the national trails. The degree of alteration would be greatest under Alternative A because of fewer land use restrictions protecting sensitive resources next to national trails. Conversely, the implementation of increased restrictions to protect GRSG under Alternative C would result in the fewest impacts on national trails. Alternatives B, D, and E, and the Proposed Plans are less restrictive than Alternative C and therefore slightly greater impacts could be incurred than under Alternative C.

5.24 Social and Economic Impacts (Including Environmental Justice)

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect social and economic conditions are chiefly mining and mineral exploration and development, lands, realty, transportation, ROWs, renewable energy development, recreation, and livestock grazing.

The cumulative impact analysis area used to analyze potential impacts on social and economic conditions consists of the 27 counties identified as either the primary or secondary socioeconomic study area, which are listed in the introduction to the Social and Economic Conditions (including Environmental Justice) section of **Chapter 3**, Affected Environment. Thus, the cumulative impact analysis area addresses virtually the entire state of Utah.

Changes to social and economic conditions result when individuals, businesses, governments, and other organizations take a variety of different types of actions, from starting a business to purchasing a property, or retiring. Millions of individual decisions will be made by many thousands of people, over the next several decades, that will affect trends in employment, income, housing, and fiscal conditions presented in the Social and Economic Conditions (including Environmental Justice) section of **Chapter 4**, Environmental Consequences. Projections published by the Utah Governor's Office of Planning and Budget account for these individual decisions in the aggregate, and provide a baseline for comparing effects of alternatives in the future. The Governor's Office of Planning and Budget projections represent a regional forecast taking a wide range of actions into account – management actions by the BLM and Forest Service as well as many other agencies of state and local government, private citizens, and businesses. As a result, they incorporate the past, present, and reasonably foreseeable future projects that will form the basis of future economic and social trends in the cumulative impact analysis area. Current and future trends in the cumulative impact analysis area include population growth and change, increases in mining activity, including oil and gas development, renewable energy development, increases in recreational demand, and ongoing livestock grazing.

As noted in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**, some of the predicted employment and income effects of the actions considered in this EIS could be quantified, including the indirect and induced impacts of these actions (calculated using IMPLAN, a regional economic model). **Table 5.43**, Projected Employment by Alternative for Primary and Secondary Socioeconomic Study Area, shows projected employment for 2030, as forecast by the Governor's Office of Planning and Budget. Because Alternative A represents current management plans, employment would correspond most closely to the existing forecast. By contrast, employment under Alternatives B, C, D, and E would be expected to change from the Governor's Office of Planning and Budget projections, with the best estimate for those changes being the quantities shown in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**. Thus, **Table 5.43** shows the estimated change in employment for these alternatives, based on modifying the projected 2030 employment by the estimated changes for the study area (from IMPLAN).

The Governor's Office of Planning and Budget does not provide forecasts for other variables (labor income or economic output) discussed in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**. However, employment can serve as a reasonable proxy for other measures of economic and social activity, as employment has a direct relationship to earnings, output, tax revenues, and other social and economic measures of interest.

As noted in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**, coal, oil and gas, and livestock grazing constitute substantial driver of changes in employment and earnings in the study area. This is also evident in **Table 5.43**.

Table 5.43
Projected Employment by Alternative for Primary and Secondary Socioeconomic Study Area

Item	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Proposed Plans
Employment (2010)	1,555,974	1,555,974	1,555,974	1,555,974	1,555,974	1,555,974
Change in employment (2030) related to oil and gas (federal, state, and private fluid minerals)	N/A	-315	-764	-36	0	-23
Change in employment (2030) related to coal	N/A	-715	-975	0	0	-111
Change in employment (2030) related to wind	N/A	-30	-30	-30	0	-30
Change in employment (2030) related to grazing	N/A	0	-634 (C1) -254 (C2)	0	0	0
Overall change in 2030 employment	N/A	-1,060	-2,403 (C1) -2,023 (C2)	--66	0	-164
Projected 2030 employment	2,157,147	2,156,087	2,154,744(C1) 2,155,124(C2)	2,157,081	2,157,147	2,156,983
% change, 2010 to 2030	38.64%	38.57%	38.48% (C1) 38.51% (C2)	38.63%	38.64%	38.63%

Source: Utah Governor's Office of Planning and Budget 2013 (data for the 27 counties of the primary and secondary socioeconomic study areas), modified by estimates from IMPLAN, as documented in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**.
Changes related to specific sectors include direct, indirect, and induced effects from IMPLAN; see **Appendix T**, Detailed Employment and Earnings Data, for a detailed description of this model.
Note: The source of 2010 employment data used in this table (Utah Governor's Office of Planning and Budget 2013) differs from that used in in the Social and Economic Conditions (including Environmental Justice) section of **Chapter 3**, so there may be differences between the two estimates.

Ranchers generally face a difficult economic environment, and frequently note that the ability to use federal grazing land provides an important source of forage that contributes to their economic viability. Past, present and reasonably foreseeable future actions of federal, state and local governments will affect the economic environment facing ranchers, although changing demographic and economic conditions are also likely to be important determinants of the continued economic viability of ranches and the associated social values. Alternatives C1 and C2 would have substantial impacts on livestock grazing, as documented in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**. Although the impacts on employment and earnings may appear relatively small in **Table 5.43**, the impacts in local areas could be substantial, especially areas where livestock grazing forms the foundation of economic activity and areas where the economy is relatively concentrated in livestock-related businesses. Additionally, the livestock grazing and ranching sector across Utah is quite influential in terms of establishing community character, identity, and social values. Thus, land management decisions caused by the proposed action affecting livestock grazing, especially in Alternatives C1 and C2, have the potential to have far-reaching effects on the social structure in the planning area. This is

especially true given the context of past, present and reasonably foreseeable future actions that may make livestock grazing ever more challenging for some ranchers.

Mineral exploration and development would be expected to continue to occur under all alternatives. However, due to the reductions in areas open to exploration and development discussed in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**, development areas and related economic activity would vary by alternative. To some degree, with recent technological developments in directional drilling for oil and gas, it is possible that wells drilled from private surface land could develop oil and gas resources from reservoirs that also underlie federal surface. Thus, to some degree, exploration and development activity on state and private land may offset reductions on federal lands. This is true for Alternatives B, C, and D, as well as the Proposed Plans.

Decisions from this document would have effects that, when combined with other past, present, and reasonably foreseeable actions, would produce cumulative effects on social and economic conditions. However, if Alternative A or E were selected, current and future trends in social and economic conditions would not be impacted or would be minimally affected. Restrictions on development and land use under Alternatives B, C, and D, and the Proposed Plans could impair economic growth (e.g., employment) in some sectors in some locations. Based on the data from the IMPLAN model and qualitative analysis of economic activity from other sectors, cumulative impacts on earnings, output, employment, and tax revenues due to activities on BLM-administered and National Forest System lands would be greatest under Alternative C. In the context of overall employment and earnings projections, and from a regional perspective, the impacts would be relatively minor. However, as documented in the Social and Economic Impacts (including Environmental Justice) section of **Chapter 4**, there could be impacts on specific communities and local geographic areas that must be taken into account, even if they are not visible at the regional level. This is especially a concern for smaller communities that are adjacent to large areas of federally managed GRSG habitat and that have economies focused on ranching or oil and gas development.

Impacts from Utah GRSG management alternatives could have cumulative effects with those of GRSG management in other sub-regions of the GRSG range. In particular, GRSG management in one sub-region may have effects that extend across sub-region borders and into counties also affected by GRSG management from other sub-regions.

The Northwest Colorado GRSG RMPA/EIS includes Uintah County, Utah, as part of its secondary socioeconomic study area, because Vernal provides oil and gas services to some areas in Northwest Colorado. GRSG management in Northwest Colorado could affect oil and gas service providers in Uintah County. **Table 4.52**, Average Annual Impact of Management Actions Affecting Oil and Gas on Output, Employment, and Earnings by Alternative, Relative to Alternative A – Three County Area, shows the estimated potential impacts of GRSG management in Utah on the three county area of Deschesne, Carbon and Uintah, through effects on oil and gas production. Alternative C could impact up to 1.5 percent of employment in those three counties, with Alternatives B and D having impacts on less than 1 percent of the 2010 employment in those three counties of 42,013 jobs. GRSG management in Northwest Colorado could impact up to 8,651 jobs from its effects on oil and gas in a 13 county area that

includes Uintah County, under Alternative C, the most restrictive alternative in the Northwest Colorado GRSG RMPA/EIS. The share of these jobs that would affect Uintah County depends on the share of total expenditures with oil and gas development in Northwest Colorado that would be spent with service providers in Uintah County. This share is currently not known.

Impacts of Utah GRSG management alternatives on phosphate mining could also have cumulative impacts with GRSG management alternatives in other parts of the GRSG range, particularly in Idaho. Because, as previously explained, the impacts of management proposed in the Utah GRSG LUPA/EIS on phosphate production are uncertain, it is not possible to quantify the cumulative impacts of GRSG management across the range. However, the BLM and Forest Service do not expect impacts of management alternatives on phosphate development in Utah and Idaho to have major impacts on production of fertilizer or animal feed or impacts on the food industry. According to the USGS, 85 percent of domestic output of phosphate rock ore comes from Florida and North Carolina, with 15 percent coming from Utah and Idaho. World phosphate rock production capacity was expected to increase between 2013 and 2017 more than the increase in consumption of diphosphorus dioxiode in fertilizers (USGS 2014).

5.25 TRIBAL INTERESTS

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely to continue to affect tribal interests are transmission lines, transportation/travel planning and development projects, vegetation treatments (including noxious weed and fuels treatments), minerals and energy exploration, energy development projects (including oil and gas field development and infrastructure projects), and grazing allotment improvements (including fenceline construction and water developments).

With the trends of increasing oil and gas development projects, transmission lines, travel management planning and projects, and renewable energy developments, there would be increased pressure on tribal resources, treaty and trust assets, and sacred sites. Impacts would be spread across the landscape, and tribal interests, assets, resources and sites located in areas outside of GRSG habitat would also be affected. The range of laws that require federal agencies to protect and preserve tribal trust assets, treaty rights, sacred sites, and other resources on lands under federal agency jurisdiction would provide some mitigation to the impacts; however, actions occurring on nonfederal lands (whether private or state jurisdiction) would have less protections, resulting in increased magnitude and severity of impacts in these areas. Prohibiting or restricting development projects in the decision area would protectively impact tribal resources in the planning area. However, closures to and restrictions on development could also cause development to shift to nearby private or state land with no such closures or restrictions. This shift effect would be reduced by the State of Utah's plan for the protection of GRSG. Because the State's plan calls for avoiding, minimizing, or mitigating impacts from land uses on GRSG, it will likely result in closures to or restrictions on development on state and private lands within GRSG habitat.

Alternatives Analysis

The incremental contribution of the management actions being analyzed under Alternatives B through E of this LUPA/EIS to cumulative impacts on tribal interests would be to reduce

conflicts with tribal interests by reducing development in the planning area. However, because development may shift from the decision area to other parts of the planning area because of management proposed under this LUPA/EIS, reduction in development in the decision area may not always result in a corresponding reduction in development in the planning area. Development of transmission projects is most likely to be reduced because of this LUPA/EIS due to the limited options for siting large projects across the entire planning area. Development of more localized projects such as oil and gas projects or transportation planning would be less likely to be reduced as much throughout the planning area due opportunities for those projects to shift to other parts of the planning area outside the decision area.

As stated previously, for federal undertakings, consultation would continue with Native American groups to identify any sacred sites, traditional cultural properties, or tribal resource uses and address impacts. Through this process, effects would be minimized or eliminated, although residual effects would still be possible.

Chapter 6
Consultation and Coordination

CHAPTER 6
CONSULTATION AND COORDINATION

6.1 CHANGES BETWEEN THE DRAFT LUPA/EIS AND PROPOSED LUPA/FINAL EIS

As a result of public comments, cooperating agency coordination, and internal review of the Draft LUPA/EIS, the BLM and Forest Service have made several changes to this chapter. Changes include the following:

- In the Draft LUPA/EIS, Consultation and Coordination was addressed in **Chapter 5**. In the Proposed LUPA/Final EIS, discussion of cumulative effects has been separated from the direct and indirect impacts discussed in **Chapter 4** and has become its own chapter. As a result, Consultation and Coordination has been moved from **Chapter 5** to **Chapter 6**.
- Information related to ongoing consultation and coordination efforts have been included.
- The section addressing consistency with state, local, and tribal plans has been revised to reflect just the Proposed Plans rather than all of the draft alternatives. Consistency discussions have also been consolidated.
- Language outlining public outreach efforts on the Draft LUPA/EIS have been added.
- Language summarizing comments received on the Draft LUPA/EIS and how the BLM and Forest Service addressed those comments has been added.

6.2 INTRODUCTION

This chapter describes the efforts undertaken by the BLM and Forest Service throughout the process of developing the LUPA/EIS to ensure the process remained open and inclusive to the extent possible. This chapter also describes efforts taken to comply with legal requirements to consult and coordinate with various government agencies. These efforts include public scoping; identifying and designating cooperating agencies; consulting with applicable federal, state, and tribal governments; and identifying "any known inconsistencies with State or local plans, policies or programs" (43 CFR 1610.3-2(e)).

The BLM and Forest Service land use planning activities are conducted in accordance with NEPA requirements, CEQ regulations, and DOI and USDA policies and procedures implementing NEPA, as well as specific BLM and Forest Service planning and NEPA policies. The NEPA and associated laws, regulations, and policies require the BLM and Forest Service to seek public involvement early in and throughout the planning process to develop a range of reasonable alternatives to proposed actions and to prepare environmental documents that disclose the potential impacts of proposed alternatives.

Public involvement and agency consultation and coordination have been at the heart of the planning process leading to this Proposed LUPA/Final EIS. These efforts were achieved through Federal Register notices, public and informal meetings, individual contacts, media releases, planning bulletins, and a series of GRSG planning-related websites. This chapter documents the outreach efforts that have occurred to date. Additional efforts will continue as the planning process continues and the Final LUPA and RODs are prepared.

6.3 FORMAL CONSULTATION EFFORTS

Various federal laws require the BLM and Forest Service to consult with American Indian Tribes, the State Historic Preservation Office, and USFWS, the EPA, and the US Department of Defense during the planning/NEPA decision-making process. This section documents the specific consultation and coordination efforts undertaken throughout the process of developing the LUPA/EIS.

6.3.1 American Indian Tribal Consultation

In accordance with the National Historic Preservation Act and several other legal authorities (see BLM Manual 8120 and Forest Service Manual 2360), and in recognition of the government-to-government relationship between individual tribes and the federal government, the BLM has initiated tribal consultation efforts related to preparation of this LUPA. In December 2011, the BLM sent letters to tribal governments providing initial notification of the LUPA, background information on the project and notification of subsequent consultation efforts related to the planning process. These letters were sent to following 15 tribes who are located in Utah or have cultural ties to areas with GRSG habitat in Utah:

- Confederated Tribes of the Goshute Indian Reservation
- Eastern Shoshone Tribe
- Hopi Tribal
- Kaibab Band of Paiute Indians
- Navajo Nation
- Navajo Utah Commission
- Northwest Band of Shoshone Nation
- Paiute Indian Tribe of Utah
- Shoshone-Bannock Tribes
- Skull Valley Band of Goshute Indians

- Southern Ute Indian Tribe
- Te-Moak Tribe of Western Shoshone Indians of Nevada
- Ute Indian Tribe—Uintah and Ouray Reservation
- Ute Mountain Ute Tribe
- White Mesa Ute Tribe

The initial letters were followed by personal phone contacts from BLM managers to tribal representatives. These initial contacts also included an invitation to be a cooperating agency. Cooperating agency activities are discussed generally in **Section 6.1**, Cooperating Agencies, and specifics related to tribal participation and coordination is included below.

The Confederated Tribes of the Goshute Indian Reservation responded to the initial letter, accepting the invitation to be a cooperating agency. The BLM presented additional information related to the project at a Tribal Council Meeting on February 10, 2012. The Confederated Tribes of the Goshute Indian Reservation formalized their cooperating agency status through a Memorandum of Understanding on June 1, 2012. They have participated in a variety of meetings, briefings, and reviews throughout preparation of the EIS.

The Shoshone-Bannock Tribes responded to the letter and follow-up phone conversations, requesting additional information before making a decision on cooperating agency status. Through coordination with the BLM's Utah and Idaho State Offices and the Shoshone-Bannock Tribe, the Tribe decided not to become a cooperating agency, but did request ongoing consultation in relation to the GRSG planning efforts in Idaho and the adjacent states. It was determined that the BLM's Idaho Falls District would take the lead in face-to-face consultation efforts, but that if additional information was necessary from other planning efforts, that information would be provided as needed and requested.

The Paiute Indian Tribe of Utah also requested information on the project. The BLM and Forest Service consulted with the Paiute Indian Tribe of Utah on November 1, 2013. At a Tribal Council Meeting, the agencies presented information related to the planning process in general and the Draft LUPA/EIS in particular. At the end of the briefing, several questions were discussed and the BLM and Forest Service offered additional efforts related to consultation on the GRSG planning effort. The Council noted appreciation for the information and the meeting ended. Additional consultation efforts were conducted during development of the Proposed LUPA/Final EIS.

Prior to publishing the Draft LUPA/EIS, the BLM and Forest Service sent another letter to the tribes noted above informing them again of the planning effort and again offering formal consultation. All of these tribes were also provided a newsletter concerning publication of the Draft LUPA/EIS and its availability for public review and comment. The Navajo Nation and the Ute Indian Tribe—Uintah and Ouray Reservation submitted comments during the public comment period.

The Navajo Nation provided a letter to the BLM and Forest Service on December 2, 2013, after having reviewed the consultation documents. The Navajo Nation Historic Preservation

Department-Traditional Cultural Program concluded that the GRSG planning effort would not impact and Navajo traditional cultural resources, and that there were no current concerns.

The Ute Indian Tribe—Uintah and Ouray Reservation provided a letter to the BLM and Forest Service on January 14, 2014, submitting comments on the Draft LUPA/EIS. Their letter acknowledges that the Draft LUPA/EIS notes the agencies do not have jurisdiction over tribal lands, but encourages the agencies to exclude tribal lands from the planning area. It also notes that, while not applicable to tribal lands, the LUPA has the potential to affect the oil and gas industry in and around the Uintah and Ouray Reservation. The letter goes on to address the Tribe's concerns regarding the alternatives, including concerns with the effect the restrictions in Alternatives B, C, and D would have on economic and socioeconomic conditions. The BLM and Forest Service reviewed and responded to the letter in accordance to requirements of NEPA, and follow-up with additional consultation efforts during development of the final LUPA/EIS.

Based on input from the communications described above, portions of the Proposed LUPA/Final EIS were adjusted to address some of the questions and concerns raised through tribal consultation. Beyond these formal communications, no other written comments were received from tribal agencies. Tribal concerns or issues have been typically presented in oral format.

6.3.2 Utah State Historic Preservation Officer Consultation

The National Historic Preservation Act and regulations at 36 CFR Part 800 govern the BLM and Forest Service's cultural resource management programs. The regulations provide specific procedures for consultation between the BLM and the State Historic Preservation Office. The State Historic Preservation Office has been included as a cooperating agency within the signed Memorandum of Understanding with the State of Utah. The State of Utah's comments on the Draft LUPA/EIS did not include any comments from the State Historic Preservation Office.

The Proposed LUPA/Final EIS was sent to the State of Utah State Historic Preservation Office for review and comment, formally initiating consultation regarding the potential affects to cultural resources regarding the Proposed Plans. The BLM and Forest Service will finalize consultation with the State Historic Preservation Office before the RODs are signed.

6.3.3 US Fish and Wildlife Service Consultation

Consultation with USFWS is required under Section 7(c) of the ESA prior to initiation of any project by the BLM or Forest Service that may affect any federally listed or endangered species or its habitat. This LUPA process is considered a major project, and the Proposed LUPA/Final EIS defines potential impacts on threatened and endangered species because of management actions proposed in the alternatives. The USFWS is a cooperating agency in this planning process, and USFWS staff has participated in interdisciplinary team meetings and has been provided drafts of alternative decisions and analyses for discussion and input.

The BLM and Forest Service formally initiated Section 7 consultation with a letter to the USFWS on November 19, 2013, and requested concurrence on which species would require consideration during consultation. Over the ensuing months, regular meetings and coordination efforts were held to identify the species that would be analyzed in the biological assessment, address which actions could affect those species, and determine whether the implementation of the Proposed Plan "may affect" the species for which this consultation occurred.

In May 2015, the biological assessment was formally submitted to the USFWS for review (see **Appendix O**, Biological Assessment for the Utah Greater Sage-Grouse Land Use Plan Amendment and Final Environmental Impact Statement). In the Biological Assessment, the BLM and Forest Service evaluated all threatened, endangered, or proposed species, and designated or proposed critical habitat that may be affected by the Proposed Plans. The determination for most species is no effect. Two species received a determination of not likely to jeopardize the continued existence of the species and 11 species received a determination of may affect, but is not likely to adversely affect. One species, the Utah prairie dog, received a determination of may affect, likely to adversely affect. This means that means that Utah prairie dog or its habitat are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

The USFWS will evaluate the biological assessment and either concur with the determination via memorandum or prepare a biological opinion. The USFWS response to this consultation process (either the memorandum or the biological opinion) will be included in the RODs.

6.3.4 US Department of Defense Consultation

Section 2815 of The National Defense Authorization Act for Fiscal Year 2000 (Public Law 106-65, 113 Stat. 512) and Section 383 of The National Defense Authorization Act for Fiscal Year 2006 (Public Law 109-163, 119 Stat. 3216) require consultation between the US Department of Defense and the DOI when the BLM proposes changes in land designation or management of certain lands in western Utah.

This planning process is considering amendments to four LUPs within the affected area (Warm Springs RMP, House Range RMP, Pony Express RMP, and Box Elder RMP). These four LUPs include all or portions of the Sheeprocks, Ibapah, and Box Elder GRSG population areas. Collectively, these population areas include approximately 28 percent of the occupied GRSG habitat in the decision area and more than 20 percent of the breeding birds in the State of Utah.

The two laws require the US Department of Defense to "conduct a study to evaluate the impact upon military training, testing, and operational readiness of any proposed changes in land designation or management" and to "prepare…an analysis of the military readiness and operational impacts of the proposed [land use plan] revision…" Until the "study" is completed and provided to Congress, the 2000 legislation directs that the BLM "may not proceed with the amendment of any individual RMP for Utah national defense lands, or any statewide EIS or statewide RMP amendment package for such lands, if the statewide EIS or statewide RMP amendment addresses wilderness characteristics or wilderness management issues affecting such lands." None of the comments the US Department of Defense has provided on the Proposed LUPA/ Final EIS represent the study or analysis referenced in either law.

The BLM entered into a cooperating agency agreement with the US Department of Defense on April 23, 2014. As part of that relationship, the BLM has provided briefings and sought input from the US Department of Defense during development of the Proposed LUPA/Final EIS. Because of this coordination, language was added to **Chapter 1** to note that the proposed plan amendments do not apply to aircraft activities that are under the jurisdiction of the Federal Aviation Administration or the Department of Defense.

The Department of Defense also noted that military over flights, such as those conducted above or near the Utah Test and Training Range, result in short periods of noise, lasting from just a few seconds or a couple of minutes. This information was incorporated into **Chapter 5** when addressing cumulative effects to GRSG.

Dugway Proving Ground shared that it had conducted 2 years of GRSG monitoring within the fenced Military Range Test Facility Base. Through the extensive survey effort, the Dugway Proving Ground has documented an absence of occupied habitat and minimal presence of very sparse areas that could be suitable habitat. This is primarily due to the lack of suitably large and contiguous patches of sagebrush within the facility's fence line. Much of the Dugway Proving Ground facility consists of salt flats and greasewood, which are not consistent with habitat or diet requirements of the GRSG. An inactive lek is present within an area underlying restricted airspace, which is 3.3 miles from the Dugway Proving Ground fence line. An active lek is located 6 miles from the Dugway Proving Ground fence line outside of Dugway Proving Ground restricted airspace. While the active lek is not located on lands administered by the Department of Defense, it is located within the Military Operating Area, which includes both lands administered by the Department of Defense and lands underlying airspace specifically identified to support Utah Test and Training Range flight activities.

Coordination with the Department of Defense has also identified components of the BLM Proposed Plan that would be complimentary with installation management. For example, invasive species management, particularly cheatgrass control, on BLM lands surrounding the Military Operating Area would benefit Dugway Proving Ground management of natural/cultural resources. Wildland fire management objectives would also directly benefit the protection of Army personnel, facilities, and natural/cultural resources.

Coordination also identified some potential Department of Defense concerns where existing communication and/or radar towers may require replacement. While the Proposed Plans would be an avoidance area for ROWs, the Department of Defense noted that new towers would generally be in the same immediate area as the tower being replaced. While avoidance in the Proposed Plan would be the preferred measure, if avoidance is not possible, minimization measures would be applied (e.g., net conservation gain, disturbance cap, RDFs, and lek buffers).

6.3.5 US Environmental Protection Agency

NEPA regulations require that EISs be filed with the EPA for review and comment (40 CFR 1506.9). The BLM provided the EPA with a copy of the Draft LUPA/EIS and the EPA has submitted comments on this document. The EPA rated the document as Environmental Concerns-Insufficient Information, "EC-2". The EPA noted that the analysis in the Draft LUPA/EIS was not clear if the proposed measures were "sufficiently protective to increase and/or maintain sustainable GRSG populations." Additional modeling and analysis has been used to develop the Proposed Plan and to include in **Chapter 4** of the Proposed LUPA/Final EIS based on EPA comments.

6.4 COOPERATING AGENCIES

Federal regulation directs the BLM to invite eligible federal agencies, state and local governments, and federally recognized Indian tribes to participate as cooperating agencies when amending RMPs (43 CFR 1610.3-1(b)). A cooperating agency is any such agency or tribe that

enters into a formal agreement with the lead federal agency to help develop an environmental analysis. More specifically, cooperating agencies "work with the BLM, sharing knowledge and resources, to achieve desired outcomes for public lands and communities within statutory and regulatory frameworks" (BLM Land Use Planning Handbook H-1601-1). These agencies are invited to participate because they have jurisdiction by law or can offer special expertise. Cooperating agency status provides a formal framework for these government units to engage in active collaboration with a lead federal agency in the planning process.

In December 2011, the BLM sent letters to 15 tribal governments and 36 local, state, and federal agencies inviting them to be cooperating agencies for the Utah Sub-regional LUPA/EIS. Subsequently, the State of Wyoming and four local government agencies in Wyoming requested and were granted cooperating agency status, given the portions of two National Forests that overlap into Wyoming and their proximity to the Utah planning area. To date, 29 agencies agreed to participate as designated cooperating agencies, 28 of which have signed Memoranda of Understanding with the BLM's Utah State Office (**Table 6.1,** Cooperating Agencies).

The BLM and State of Utah signed a statewide Memorandum of Understanding specifically for this LUPA process. Through the Memorandum of Understanding, the State of Utah (including departments and divisions, such as UDWR, Department of Agriculture and Food, and Division of Oil, Gas, and Mining) are included as cooperating agencies.

Two additional federal agencies, the Forest Service and USFWS, are participating in multiple GRSG EIS efforts throughout the west, and are cooperating agencies with each effort under a signed, national level, memoranda of understanding.

As directed by 43 CFR 1610.4, the BLM has collaborated with the cooperating agencies during data inventory and information collection, formulation of alternatives, analysis of effects of alternatives, and input on selection of the preferred alternative. However, the decision to select a preferred alternative remains the exclusive responsibility of the BLM (43 CFR 1610.4-7) or the Forest Service for their respective administrative jurisdictions. Throughout the planning process, the BLM has invited the cooperating agencies to provide information on various planning topics and other county- or state-level information within the agencies' area of special expertise. Cooperating agencies were also encouraged to attend the scoping open houses and provide comments during the scoping period (**Section 6.7.1**, Scoping Process). The BLM also held a variety of meetings, briefings, and field trips with some or all of the cooperating agencies regarding various planning issues.

The BLM sought further input from all cooperating agencies by providing them multiple opportunities to review and provide comments on planning documents (i.e., Socioeconomic Baseline Profile, Alternatives, Administrative Draft LUPA/EIS, Draft LUPA/EIS, and Administrative Draft Proposed LUPA/Final EIS). Throughout the planning process, the cooperating agencies have provided input to the BLM via verbal and/or written formats that helped develop this LUPA/EIS. Through these various avenues, the cooperating agencies have been engaged throughout the planning process.

Table 6.1
Cooperating Agencies

Agencies and Tribes Invited to be Cooperators	Agencies that Accepted	Agencies that Signed Memoranda of Understanding
Counties		
Beaver County – Utah	X	X
Box Elder County – Utah	X	X
Cache County – Utah		
Carbon County – Utah	X	X
Daggett County – Utah		
Duchesne County – Utah	X	X
Emery County – Utah	X	X
Garfield County – Utah	X	X
Grand County – Utah	X	X
Iron County – Utah	X	X
Juab County – Utah		
Kane County – Utah	X	X
Lincoln County – Wyoming	X	X
Millard County – Utah	X	X
Morgan County – Utah		
Piute County – Utah	X	
Rich County – Utah	X	X
Sanpete County – Utah	X	X
Sevier County – Utah	X	X
Summit County – Utah		
Sweetwater County – Wyoming	X	X
Sweetwater County Conservation District – Wyoming	X	X
Tooele County – Utah	X	X
Uinta County – Wyoming	X	X
Uintah County – Utah	X	X
Utah County – Utah	X	X
Wasatch County – Utah		
Wayne County – Utah	X	X
Weber County – Utah		
State Agencies		
State of Utah – Governor's Public Lands Policy Coordination Office[1]	X	X
State of Wyoming	X	X
Federal Agencies		
Forest Service	X	X
US Department of Agriculture, Natural Resources Conservation Service – Utah	X	X
US Department of Defense[2]	X	X
US Environmental Protection Agency – NEPA Program		
US Fish and Wildlife Service	X	X
Tribes		
Confederated Tribes of the Goshute Indian Reservation	X	X

Table 6.1
Cooperating Agencies

Agencies and Tribes Invited to be Cooperators	Agencies that Accepted	Agencies that Signed Memoranda of Understanding
Eastern Shoshone Tribe		
Hopi Tribe		
Kaibab Band of Paiute Indians		
Navajo Nation		
Navajo Utah Commission		
Northwest Band of Shoshone Nation		
Paiute Indian Tribe of Utah		
Shoshone-Bannock Tribes		
Skull Valley Band of Goshute Indians		
Southern Ute Indian Tribe		
Te-Moak Tribe of Western Shoshone Indians of Nevada		
Ute Indian Tribe—Uintah and Ouray Reservation, Ute Tribe Business Committee		
Ute Mountain Ute Tribe		
White Mesa Ute Tribe		

[1]The State of Utah Governor's Public Lands Policy Coordination Office coordinates the State's interests on public lands issues and acts to ensure that state and local interests are considered in the management of public lands. This includes coordinating with the applicable State-level departments to ensure information is disseminated to or collected from, and coordinates the State's collective input from the State-level departments and their various subdivisions.
[2]The Department of Defense signed a single MOU to cover all invited departments, branches, and installations under their jurisdiction, including those installations that had accepted the initial invitation (i.e., US Air Force – Hill Air Force Base; US Air Force – Utah Test and Training Range; US Army – Dugway Proving Ground).

6.5 COORDINATION AND CONSISTENCY

The BLM's planning regulations require that RMPs be "consistent with officially approved or adopted resource-related plans, and the policies and procedures contained therein, of other federal agencies, state and local governments, and Indian tribes, so long as the guidance and RMPs also are consistent with the purposes, policies, and programs of federal laws and regulations applicable to public lands" (43 CFR 1610.3-2(a)). As part of preparing the Draft LUPA/EIS, the BLM requested the state, county, and tribal government cooperating agencies review the range of alternatives and identify potential inconsistencies between the alternatives and each agency's applicable plans. This allowed the state, local, and tribal cooperating agencies to apply their special expertise regarding the familiarity with their own plans. In general, the county evaluations identified inconsistencies in Alternatives B, C, and D, with most counties noting that Alternatives A and E were the most consistent with their local plans and policies.

The BLM's planning regulations also note that the BLM "shall identify any known inconsistencies with State or local plans, policies or programs" (43 CFR 1610.3-2(e)) when submitting a proposed plan amendment for the Governor's consistency review. Because the regulations require the identification of inconsistencies to the proposed plan, the consistency evaluations for the specific alternatives have been removed from this Final EIS. In their place, this section identifies known inconsistencies between federal, state, local and tribal plans and policies, using

the previous county evaluations, comments provide during the public review period for the Draft EIS, and agency evaluation of "officially approved or adopted resource related plans" (43 CFR 1610.3-2 (a) and (b)). In instances where state and local plans, policies, or programs may differ, the BLM has disclosed both instances of inconsistency, but would defer to those of the state, per 43 CFR 1610.302(d).

The BLM is aware that there are specific state laws and local plans relevant to aspects of public land management that are discrete from, and independent of, federal law. However, the BLM is bound by federal law. Consequently, there may be inconsistencies that cannot be reconciled. The FLPMA and its implementing regulations require that BLM LUPs be consistent with officially approved state and local plans only if those plans are consistent with the purposes, policies, and programs of federal laws and regulations applicable to public lands. Where officially approved state and local plans or policies or programs conflict with the purposes, policies, and programs of federal law applicable to public lands, there will be an inconsistency that cannot be resolved. With respect to officially approved state and local policies and programs (as opposed to plans), this consistency provision only applies to the maximum extent practical. While county and federal planning processes, under the FLPMA, are required to be as integrated and consistent as practical, the federal agency planning process is not bound by or subject to state or county plans, planning processes, policies, or planning stipulations.

The following subheadings group the identification of known inconsistencies with the Proposed Plan by the type of agency (i.e., federal, state, local, and tribal). It is important to note that the identification of inconsistencies at this point in the planning process notifies state, local, and tribal governments of known inconsistencies. The absence of some inconsistencies could reflect either consistent management or an inconsistency that the agency has not specifically identified, per regulatory requirements. The formal consistency review period will allow agencies the legal opportunity to identify additional information, as applicable.

Consistency requirements are only applicable on BLM-administered lands. Consistency with state and local plans where there are no BLM-administered lands in the planning area are not addressed. In these instances consistency, as described above, is not required. However, cooperation regarding the agencies' applicable special expertise or jurisdiction by law has occurred.

6.5.1 Inconsistencies with State Plans, Policies, and Procedures

The State of Utah finalized the *Conservation Plan for Greater Sage-Grouse in Utah* in February 2013. They designed their plan to "eliminate the threats facing [GRSG] while balancing the economic and social needs of the residents of Utah through a coordinated program which provides for and incentive-based programs for private, local government and School and Institutional Trust Lands Administration (SITLA) lands, and a reasonable and cooperative regulatory programs on other state and federally managed lands" (Utah Greater Sage-Grouse Working Group 2013). Several aspects of the State's plan and the BLM's Proposed Plan are conceptually consistent, though each plan uses different wording. Alternative E1 in **Chapter 2** is based on the State's plan.

There are aspects of the State's plan that are out of the BLM's jurisdiction, such as recommendation for management of SITLA and private lands and language dealing with predator control and hunting. Though these concepts are absent from the BLM's Proposed Plan, they are

not identified as inconsistencies because the BLM cannot prescribe management on private and SITLA lands, and does not permit hunting or predator control. Inconsistencies will be limited to areas where the State's plan provides management direction for uses/areas the BLM has jurisdiction.

Known inconsistencies between the BLM's Proposed Plan and the *Conservation Plan for Greater Sage-Grouse in Utah* include the following:

- When comparing areas in the two-tier alignments of habitat prioritization (SGMA and non-SGMA for the State, PHMA and GHMA for the BLM), the State's plan and BLM's Proposed Plan align similar prioritization levels, high or low, on over 96 percent of acres. However, there are a few areas of inconsistency:

  The BLM's Proposed Plan includes portions of the following areas as PHMA where the State's plan does not include them in SGMAs: West Tavaputs, SITLA lands in the Three-Corners and Parker Mountain areas, and private and tribal lands in the Halfway Hollow area.

  There are also areas where the BLM's Proposed Plan includes areas as GHMA or no designation that the State's plan includes within SGMAs: western corner of Bald Hills, eastern side of Parker Mountain in and around Loa and the hills to the east.

- While the two-tier prioritization of GRSG habitat is over 96 percent consistent, management of lower priority areas (non-SGMAs for the State, GHMA for the BLM) differs. The BLM's Proposed Plan places fewer conservation measures on GHMA than PHMA (e.g., fluid mineral lease and development prioritization, retaining from disposal, implementation-level buffers, fluid mineral RDFs, and net conservation gain objective). However, the State's plan only applies management from existing LUPs and other site-level conservation measures. The state has noted that the identification, mapping, and application of management specific to the BLM's GHMA is not consistent with the state's Conservation Plan.
- The BLM's Proposed Plan includes the identification of SFA, with management to recommend for withdrawal from mineral location and remove the two exceptions for fluid mineral leasing NSO stipulation, compared with PHMA. There is nothing similar to this action in the State's plan.
- The State's plan provides little management for opportunity areas within SGMAs, but provides for these areas to be managed as habitat if treated. In addition, as more accurate data becomes available the State is remapping areas that are currently non-habitat but could become habitat as opportunity areas, with correlated changes in management. In the BLM's Proposed Plan, areas that could ecologically become habitat that are currently within PHMA would be managed as the same as habitat, before and after they are treated. However, BLM's Proposed Plan manages opportunity areas outside PHMA to minimize GRSG impacts; if such areas were treated and became habitat, additional planning action would be required to make them PHMA with all the commensurate conservation measures.

- The State's principle conservation measure for habitat in SGMAs is to avoid the action. This is conceptually consistent with the BLM's Proposed Plan allocations (e.g., lands and realty actions are avoided; fluid minerals are managed as NSO, with two exceptions; mineral materials are managed as closed unless expansion of existing sites or new free-use site). The State's plan notes that if avoidance is not possible, minimization and mitigation would occur. However, in many such instances, if avoidance was not possible the BLM's Proposed Plan would likely preclude such actions (e.g., only two exceptions for fluid minerals and none in SFA; no new mineral material sites that are not free-use; no non-energy leasable mineral developments if it can't meeting the disturbance and density caps).
- While both the BLM and State plans institute a disturbance cap, they would be inconsistently applied. For example, the BLM's cap is 3 percent of total disturbance, with disturbance defined generally as minerals and lands actions, and roads (see **Appendix E**, Greater Sage-Grouse Disturbance Cap Guidance, for more detail). If disturbance is exceeded, no new activities would be permitted, subject to valid existing rights. The State's cap is 5 percent of new disturbance and applies to permanent disturbance (expected to last more than five years), but is identified as a "general limit on new permanent disturbance." In addition, the State's plan does not include "temporary" disturbances that are expected to last less than five years, whereas the BLM's Proposed Plan applies the cap to all disturbances.
- The BLM's Proposed Plan includes specific habitat quality objectives. There is nothing similar in the State's plan.
- The BLM's Proposed Plan includes a density of energy/mining facilities cap. There is nothing similar in the State's plan.
- The BLM's Proposed Plan limits OHV use in PHMA and GHMA to designated or existing routes. The State's plan does so as well, but only in SGMA nesting and winter habitat. The BLM's Proposed Plan also provides direction to consider during the route designation process. There is nothing similar in the State's plan.
- The BLM's Proposed Plan includes strategies to be implemented to minimize the risk of improper livestock grazing. While the State's plan identifies Grazing Practices for Greater Sage-Grouse Conservation (see State's plan Appendix 2), it is unclear if those are requirements, or suggestions.
- The State's plan excludes proposals that have nearly completed environmental reviews from applying its conservation measures (e.g., Alton coal lease, TransWest Express Transmission Line, Sufco Mine Green's Hollow coal lease, Kinney Mine proposal). The BLM's Proposed Plan only excludes the TransWest Express Transmission Line project from adhering to its measures.

The portions of the Utah Sub-region planning area within the State of Wyoming are National Forest System lands. As such, there is no legal or regulatory requirement for consistency.

6.5.2 Inconsistencies with County Plans, Policies, and Procedures

In their consistency evaluation of the range of alternatives for the Draft LUPA/EIS, as well as in subsequent comments on the public review Draft LUPA/EIS, the vast majority of the responding

counties noted that county plans were most consistent with Alternative E1. Comments usually also noted that Alternatives B, C, and D are primarily inconsistent with county plans, primarily because they would restrict resource extraction, infrastructure development, and potential for road or grazing closures. Some counties also noted that Alternative A was consistent with county plans, especially given the relatively recent completion dates (2008). Inconsistencies between the BLM's Proposed Plan and the State's plan, presented as Alternative E1 in the alternatives, is available above and will not be repeated here.

A common note of inconsistency between Alternatives B, C and D and their newly adopted county plans was the differences between the PHMA/GHMA breakdown versus the State's identification of habitat, opportunity areas, and nonhabitat. This is addressed in the first four inconsistencies identified in the State's plan above. For many counties, because the BLM uses different boundaries than the state's SGMAs, and especially because the BLM mapped GHMA, contrary to the state's mapping, there are inconsistencies. Two counties have created their own GRSG map, which differs from both the state's SGMAs and the BLM's PHMA/GHMA maps. In these instances, there are inconsistencies between the proposed LUPA and local plans.

Another common inconsistency noted by the counties related to the land tenure and disturbance cap elements of the alternatives. Concerns related to inconsistency was mostly from counties dominated by public lands, where counties noted that such management was inconsistent with county plans that established a no net loss objective for private lands and increases in development to support economic development. There were also concerns that applying PHMA and the disturbance cap to private lands could lead to de facto regulation of private property or private action, and potentially a net loss of private land base, all of which would be inconsistent with their county plans.

Most of the counties that supported the State's plan have passed county resolutions adopting the plan, and some were working on developing their own county plan, using the State's plan as a starting point. One concern many counties had with the State's plan was the inclusion of wildfire in the disturbance cap. Given the management of the disturbance cap in the Proposed Plan, this is not an inconsistency for the BLM's Proposed Plan in the Proposed LUPA/Final EIS.

Three counties identified the State's plan as an interim management measure while they worked on county-specific plans. Those county plans would be based generally on the State's plan, but would be adjusted to address perceived inaccuracies in mapping, drawing boundaries just around existing sagebrush and excluding areas with disturbance, juniper trees, or other non-sagebrush land-cover. Those county plans would also apply a management approach focusing on a no-net loss objective, using an NRCS habitat evaluation tool combined with aggressive vegetation treatment targets to increase habitat. This would be applied instead of what they felt was a heavy-handed focus on restriction in Alternatives B, C and D, rather than a focus on habitat expansion. These items would also be inconsistent with the BLM's Proposed Plan. While these items were considered in development of the alternatives and the Proposed Plan, most were dismissed from detailed analysis for reasons discussed in **Section 2.11**, Alternatives Eliminated from Detailed Analysis. Finally, these and other counties encouraged exclusion of private lands from PHMA given the percentage of federal land ownership in their counties and similar concerns for private lands discussed above.

Some of the counties working on their own county plans identified additional inconsistencies with the BLM's alternatives that were more procedural in nature. At least one county had passed ordinances that require county approval of all data, methods, findings, and maps used in federal planning and federal actions regarding GRSG protection. They also have management that requires site-specific analysis of all habitat designations. Finally, they have management that requires all federal actions comply with local law. Another example of this is a county ordinance in northeastern Utah that notes that access to public lands for mineral development must be increased. The Proposed Plan is inconsistent with these types of local county policies, as described above.

It is important to note that only one county has provided the BLM an officially approved and adopted plan. The remainder of the counties are in various stages of developing their plans.

6.5.3 Inconsistencies with Tribal Plans, Policies, and Procedures

The Ute Indian Tribe—Uintah and Ouray Reservation in the only tribe that has specifically identified a plan related to GRSG management. Adopted by ordinance in May 2013, the GRSG Conservation Ordinance was developed to preclude listing of GRSG while protecting the economic well-being of the Tribe. The rules specify requirements that oil and gas operators must follow to minimize direct impacts to suitable habitat and eliminate direct impacts to individual birds during the nesting and mating season.

Known inconsistencies between the BLM's Proposed Plan and the Ute Indian Tribe GRSG Conservation Ordinance include the following:

- The BLM Proposed Plan includes management that addresses GRSG threats beyond fluid mineral leasing and development (e.g., non-energy leasable minerals, mineral materials, wildfire, transmission lines and pipelines, juniper encroachment, invasive species, and improper livestock grazing).
- The BLM Proposed Plan's management for fluid mineral includes more restrictions (e.g., NSO in all PHMA, disturbance caps, density caps, and noise requirements).

6.6 RESOURCE ADVISORY COUNCILS

Resource advisory councils are citizen-based groups that provide an opportunity for individuals from multiple backgrounds and interests to have a voice in the management of public lands, and to help improve their health and productivity. Resource advisory councils provide advice and recommendations to the BLM on land use planning and management of public lands and resources. Resource advisory council recommendations address all public land issues, including land use planning, recreation, noxious weeds, and wild horse and burro HMAs. Throughout the GRSG LUPA process, the BLM has provided regular briefings to the Utah Resource Advisory Council to facilitate the Council's ability to provide informed advice on the Draft LUPA/EIS. This culminated in the Resource Advisory Council providing a formal letter with advice to the BLM on the Draft LUPA/EIS in early 2014. The recommendations from the Resource Advisory Council encouraged the BLM to work with the State of Utah to find common ground related to many of the differences between the Draft LUPA/EIS preferred alternative and Alternative E1.

6.7 PUBLIC INVOLVEMENT

Public involvement is a vital and legal component of both the land use planning and NEPA processes. Public involvement provides the public opportunities to raise issues to be addressed in the planning process, disclosure of the alternatives being analyzed and the effects anticipated, and, in general, invests the public in the decision-making process. Guidance for implementing public involvement under NEPA is codified in 40 CFR 1506.6, thereby ensuring that federal agencies make a diligent effort to involve the public in the NEPA process. Section 202 of the FLPMA directs the Secretary of the Interior to establish procedures for public involvement during land use planning actions on public lands. These procedures can be found in the BLM's Land Use Planning Handbook (H-1601-1). Public involvement for this LUPA/EIS includes the following four phases:

- Public scoping before NEPA analysis begins to determine the scope of issues and identify potential alternatives to be addressed in the LUPA/EIS
- Public outreach via news releases
- Collaboration with federal, state, local, and tribal governments and cooperating agencies
- Public review of and comment on the draft LUPA/EIS, which analyzes likely environmental effects and identifies the preferred alternative

The public scoping phase of the process has been completed and is described in **Section 6.7.1**. The public outreach and collaboration phases are ongoing throughout the LUPA/EIS process. Information about the process can be obtained by the public at any time on the LUPA website (http://www.blm.gov/ut/st/en/prog/planning/SG_RMP_rev.html). This website contains background information about the project, a public involvement timeline, and copies of public information documents released throughout the LUPA/EIS process.

6.7.1 Scoping Process

The formal public scoping process for the LUPA/EIS began on December 9, 2011, with the publication of the NOI in the Federal Register (76 *Federal Register* 2011-31652, December 9, 2011). The NOI notified the public of the BLM's intent to develop LUPAs for the management of GRSG and initiated the public scoping period, which closed on March 23, 2012.

News Releases

Multiple news releases were provided to local news organizations in the weeks preceding the public meetings in their areas. These news releases announced the scoping period for the LUPA/EIS process and provided information about the upcoming open house scoping meetings.

Scoping Open Houses

The BLM hosted eight open houses throughout Utah to provide the public with opportunities to become involved, learn about the project and the planning process, meet the LUPA team leaders, and offer written comments. The public was notified of the open houses by news release and on the BLM's national and regional websites. Information on the open houses is provided in **Table 6.2**, Scoping Open House Information.

Table 6.2
Scoping Open House Information

Location (Utah)	Venue	Date	Attendees
Price	Carbon County Events Center	January 17, 2012	39
Vernal	Western Park Convention Center	January 18, 2012	44
Salt Lake City	Hampton Inn and Suites	January 19, 2012	67
Randolph	Randolph Senior Center	January 23, 2012	33
Snowville	Snowville Town Hall	January 24, 2012	60
Richfield	Sevier County Offices	January 30, 2012	58
Kanab	Kanab City Library	January 31, 2012	56
Cedar City	Heritage Center-Festival Hall	February 1, 2012	39
		Total	**396**

Note: All meetings were held from 5:30 to 7:30 pm.

Scoping meetings were held in an open house format to encourage participants to discuss concerns and questions with the BLM staff representatives. The BLM gave a short presentation to provide an overview of the LUPA process and present information about public involvement opportunities. GRSG occupied habitat maps were shown to give an idea of the lands that might be affected by the planning decisions. Copies of the NTT report (NTT 2011) and scoping comment forms were available. A total of 396 people signed in at the open houses.

Scoping Comments Received

Many comments provided during the scoping process addressed general GRSG issues and did not apply to one state or EIS process. Other comments provided during scoping were specific to certain sub-regions, or in some cases, specific to certain counties. Nearly 650 unique comment letters were provided for the entire GRSG planning process during scoping, though this number does not include individuals who submitted comments via one of the several form letters received. From all the comments provided, approximately 7,470 comments were identified, associated with a variety of issues. As sub-set of these letters and comments, 31 unique comment letters were provided specific to the Utah Sub-region, nearly half of which were from state and local governments. Within these letters, approximately 150 Utah-specific comments were identified for consideration in the Utah LUPA process, along with the other comments identified at the regional and national levels. Approximately 54 percent of the comments dealt with issues associated with livestock grazing, GRSG habitat management, or social, economic, and environmental justice concerns.

Detailed information about the comments received and about the public outreach process can be found in the National Greater Sage-Grouse Planning Strategy Scoping Summary Report, finalized in May 2012. The issues identified during public scoping and outreach helped refine the list of planning issues, included in **Section 1.6**, Scoping and Identification of Issues for Development of the Proposed Plan and Draft Alternatives, which guided the development of alternative management strategies for the LUPA.

6.7.2 Project Website

The BLM maintains several interactive websites to provide the public with the latest information about the LUPA/EIS process. During scoping, before the Utah Sub-regional website was available, there were websites for each of the regions in the GRSG planning process (West/Great Basin Region and East/Rocky Mountain Region), as well as a website that contained information on the national planning process (http://www.blm.gov/wo/st/en/prog/more/sage_grouse_home2.html). As each sub-region set-up their own websites, the regional websites were discontinued, though the national website continues to provide extensive background information on the series of separate west-wide planning processes that together comprise the national GRSG planning strategy. The Utah Sub-regional website (http://www.blm.gov/ut/st/en/prog/planning/SG_RMP_rev.html) provides background information about the project, a project timeline, maps of the planning area, information used during the scoping meetings, and copies of public information documents such as the NOI and press releases.

Both the national and Utah Sub-regional project websites continue to be updated with information pertinent to the planning processes.

6.7.3 Mailing List

The Utah BLM compiled a mailing list from each BLM Field Office or National Forest participating in the LUPA. The resulting list included nearly 2,300 individuals, agencies, and organizations that had participated in past BLM projects within Utah. Attendees at the scoping open houses were added to the mailing list if they chose to receive or continue to receive project information. In addition, all individuals or organizations who submitted scoping comments were added to the mailing list. Requests to be added to or to remain on the official LUPA distribution list will continue to be accepted throughout the planning process.

6.7.4 Public Comments on the Draft LUPA/EIS

Public Meetings

A notice of availability for the Draft LUPA/EIS was published in the Federal Register on November 1, 2013 (78 *Federal Register* 65700-65701). The NOA initiated a 90-day public comment period, which ended on January 29, 2014. The BLM issued a news release on October 31, 2013, announcing the release of the Draft LUPA/EIS, which provided the dates, locations, and times of eight public open houses. The BLM also distributed a postcard via US mail and e-mail to individuals on the BLM mailing list, which provided the date and city locations of the public open houses. The BLM and Forest Service also notified the public of open house meetings via the project website and a news release to media sites including newspapers, radio, and television.

The BLM and Forest Service held eight public comment open houses for the Draft LUPA/EIS from November 19 – December 12, 2013 (**Table 6.3**, Draft LUPA/EIS Open House Information). All meetings were held from 5:30 to 7:30 PM. The goal of the open houses was to inform the public about the Draft LUPA/EIS and to obtain further public input on the alternatives that were developed and analyzed. In addition, the BLM and Forest Service sought comments on potential impacts resulting from the five alternatives. At the open houses, displays introduced the various resource topics and presented the five alternatives for the resource

topics. Other displays explained the NEPA process and the methods for submitting comments. A slide show looped throughout the open house describing the Utah Greater Sage-Grouse Draft LUPA/EIS preparation process. Public comments were solicited at the open houses, where comment sheets were provided.

Table 6.3
Draft LUPA/EIS Open House Information

Location (Utah)	Venue	Date	Attendees
Richfield	Snow College, Richfield Campus	November 19, 2013	9
Cedar City	Heritage Center	November 20, 2013	7
Panguitch	Panguitch City Library	November 21, 2013	11
Vernal	Vernal City Office	December 4, 2013	15
Price	Carbon County Events Center	December 5, 2013	10
Salt Lake City	Downtown Library	December 10, 2013	36
Randolph	Randolph Senior Center	December 11, 2013	20
Snowville	Snowville Town Hall	December 12, 2013	32
		Total	**140**

Comment Analysis Methodology

After publishing the Draft LUPA/EIS, the BLM and Forest Service held a 90-day public comment period to receive comments on the Draft LUPA/EIS. The BLM and Forest Service received written comments by mail, email, and submissions at the public meetings. Comments covered a wide spectrum of thoughts, opinions, ideas, and concerns. The BLM and Forest Service recognize that commenters invested considerable time and effort to submit comments on the Draft LUPA/EIS and developed a comment analysis methodology to ensure that all comments were considered as directed by NEPA regulations.

According to the NEPA, the BLM and Forest Service are required to identify and formally respond to all substantive public comments. The BLM and Forest Service developed a systematic process for responding to comments to ensure all substantive comments were tracked and considered. Upon receipt, each comment letter was assigned an identification number and logged into CommentWorks, a web-based database that allowed the BLM and Forest Service to organize, categorize, and respond to comments. Substantive comments from each letter were coded to appropriate categories based on content of the comment, retaining the link to the commenter. The categories generally follow the sections presented in the Draft LUPA/EIS, though some relate to the planning process or editorial concerns.

Comments similar to each other were grouped under a topic heading, and the BLM and Forest Service drafted a statement summarizing the ideas contained in the comments. The responses were crafted to respond to the comments; a response indicates whether the commenters' points resulted in a change in the document. Because of public comments, changes were made to the Draft LUPA/EIS and reflect consideration given to public comments. A summary of major changes between the Draft LUPA/EIS and the Proposed LUPA/Final EIS can be found in **Section 1.11**, Changes between the Draft LUPA/EIS and Proposed LUPA/Final EIS.

Although each comment letter was diligently considered, the comment analysis process involved determining whether a comment was substantive or nonsubstantive in nature. In performing this analysis, the BLM and Forest Service relied on the CEQ's regulations to determine what constituted a substantive comment.

A substantive comment does one or more of the following:

- Questions, with a reasonable basis, the accuracy of the information and/or analysis in the EIS
- Questions, with a reasonable basis, the adequacy of the information and/or analysis in the EIS
- Presents reasonable alternatives other than those presented in the draft EIS that meet the purpose and need of the proposed action and addresses significant issues
- Questions, with a reasonable basis, the merits of an alternative or alternatives
- Causes changes in or revisions to the proposed action
- Questions, with a reasonable basis, the adequacy of the planning process itself

Additionally, BLM's NEPA handbook identifies the following types of substantive comments:

- Comments on the Adequacy of the Analysis: Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate are substantive in nature but may or may not lead to changes in the Final EIS. Interpretations of analyses should be based on professional expertise. Where there is disagreement within a professional discipline, a careful review of the various interpretations is warranted. In some cases, public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the manager responsible for preparing the EIS (the Authorized Officer) does not think that a change is warranted, the response should provide the rationale for that conclusion.
- Comments That Identify New Impacts, Alternatives, or Mitigation Measures: Public comments on a draft EIS that identify impacts, alternatives, or mitigation measures that were not addressed in the draft are substantive. This type of comment requires the Authorized Officer to determine whether it warrants further consideration. If it does, the Authorized Officer must determine whether the new impacts, new alternatives, or new mitigation measures should be analyzed in the Final EIS, a supplement to the Draft EIS, or a completely revised and recirculated Draft EIS.
- Disagreements with Significance Determinations: Comments that directly or indirectly question, with a reasonable basis, determinations regarding the significance or severity of impacts are substantive. A reevaluation of these determinations may be warranted and may lead to changes in the Final EIS. If, after reevaluation, the Authorized Officer does not think that a change is warranted, the response should provide the rationale for that conclusion.

Some submissions received contained substantive comments, but were out of the scope of this project. These included comments on subjects not related to this effort, other GRSG efforts, or

BLM or Forest Service laws, rules, regulations, or policy. These comments were reviewed and sent along to the appropriate party as needed, but are not included in the comment response for this effort.

Comments that failed to meet the above description were considered nonsubstantive. Many comments received throughout the process expressed personal opinions or preferences, had little relevance to the adequacy or accuracy of the Draft LUPA/EIS, or represented commentary regarding resource management without any real connection to the document being reviewed. These comments did not provide specific information to assist the planning team in making a change to the Preferred Alternative, did not suggest other alternatives, and did not take issue with methods used in the Draft LUPA/EIS, and are not addressed further in this document. Examples of some of these comments include the following:

- The best of the alternatives is Alternative D (or A, B, C, or E).
- Your plan does not reflect balanced land management.
- Stop giving away land to the mineral companies.
- More land should be protected as wilderness.
- I want the EIS to reflect the following for this area: no grazing, no recreation, no drilling, and no mining.
- You need to protect all ACECs/Wild and Scenic Rivers/areas with wilderness characteristics.
- Do not add any more road closures to what is now in existence.
- People need access and the roads provide revenue for local communities.
- More areas should be made available for multiple uses (e.g., drilling, OHVs, and ROWs) without severe restrictions.

Opinions, feelings, and preferences for one element or one alternative over another, and comments of a personal and/or philosophical nature were all read, analyzed, and considered, but because such comments are not substantive in nature, the BLM and Forest Service did not respond to them. It is also important to note that, while all comments were reviewed and considered; comments were not counted as "votes." The NEPA public comment period is neither considered an election nor does it result in a representative sampling of the population. Therefore, public comments are not appropriate to be used as a democratic decision-making tool or as a scientific sampling mechanism.

Comments citing editorial changes to the document were reviewed and incorporated. The Proposed LUPA/Final EIS has been edited and revised to fix typos, missing references, definitions, and acronyms, and other clarifications as needed.

Public Comments

A total of 176 unique comment letters, forms, and emails were received during the 90-day public comment period. These documents resulted in 1,138 substantive comments. Out of the 176 comment letters, 88 were submitted by private individuals (50 percent); 37 by

organizations, including businesses and environmental and wildlife protection groups (21 percent); 24 by associations, including user groups, recreational clubs, realty associations, industry groups, and partnerships (14 percent); 4 by federal agencies (2 percent); 2 by state governments (1 percent); and 21 by local governments (12 percent).The BLM and Forest Service parsed 1,109 substantive comments from the 176 submissions. Private individuals submitted 68 of these comments (6 percent), 383 were submitted by organizations (35 percent), 224 were submitted by associations (20 percent), 41 were submitted by federal agencies (4 percent), 53 were submitted by state agencies (5 percent), 340 were submitted by local governments (31 percent). See **Table 6.4**, Number of Unique Submissions and Comments by Affiliation.

Table 6.4
Number of Unique Submissions and Comments by Affiliation

Group	Number of Submissions	Number of Comments
Private individuals	88	67
Organizations (including businesses and environmental and wildlife protection groups)	37	384
Associations (user groups, recreational clubs, realty associations, industry groups, partnerships, etc.)	24	234
Federal agencies (EPA, USFWS, Forest Service, National Park Service)	4	42
State government (state agencies, Governor's Office)	2	54
Local government (county commissions and departments)	21	357
Total	**176**	**1,138**

In addition to the unique submissions discussed above, 16,566 form letters were submitted during the public comment period. Form letters are exact or very close copies of a letter that are submitted multiple times by different individuals; individuals may add additional language to the letter, but this usually does not substantially change the content of the letter. Often, form letters are created by an organization and sent to their members, who in turn submit this letter to the planning effort. For the Utah Draft LUPA/EIS, 5 different form letter masters were submitted: 2,926 letters from WildEarth Guardians; 7,810 letters from the American Wild Horses Preservation Campaign; 2,517 letters from the American Bird Conservancy; 2,102 letters from Defenders of Wildlife; and 1,211 letters from the Sierra Club. One copy of each of these letters was included in the comment analysis process as a master form letter. All of the form letters were reviewed for additional substantive content; this was included in the comment analysis process when present. All form letters were entered into the project decision file and all commenters entered into the project decision file as having submitted a comment during the Draft LUPA/EIS comment period.

A review of the 1,138 substantive comments received revealed a high level of interest about the management of GRSG (293 comments, 19.9 percent), compliance with NEPA, FLPMA, and other laws (NEPA: 190 comments, 12.9 percent; other laws: 21 comments, 1.4 percent; and FLPMA: 74 comments, 5.0 percent), mineral development (leasable minerals: 132 comments, 9.0

percent; and locatable minerals: 3 comments, 0.2 percent), socioeconomics (83 comments, 5.6 percent), livestock grazing (82 comments, 5.6 percent), and wild horse and burros (51 comments, 3.5 percent). Other topics with high levels of interest were lands and realty (39 comments, 2.6 percent), sagebrush vegetation (37 comments, 2.5 percent), predation of GRSG (32 comments, 2.2 percent), and travel management (24 comments, 1.6 percent). Topics that received moderate interest were recreation (11 comments, 0.7 percent), noise (11 comments, 0.7 percent), riparian vegetation and water resources (17 comments, 1.2 percent). The topics with the least amount of interest were wilderness areas and WSAs (5 comments, 0.3 percent); air (4 comments, 0.3 percent); cultural resources (4 comments, 0.3 percent); climate change (3 comments, 0.2 percent); noxious and invasive weeds (3 comments, 0.2 percent); ACECs (2 comments, 0.1 percent); fish and wildlife (2 comments, 0.1 percent); soil resources (2 comments, 0.1 percent); tribal interests (2 comments, 0.1 percent), national trails (1 comment, 0.1 percent); and visual resources (1 comment, 0.1 percent). In addition to these topics, comments were collected that suggested editorial changes (36 comments, 2.4 percent), were substantive comments but considered out of scope of this document (298 comments, 20.2 percent), and those that requested an extension of the comment period (5 comments, 0.3 percent). These comments were reviewed and considered, but not included in the formal comment responses effort. See **Table 6.5**, Number of Comments on the Draft LUPA/EIS by Category.

The comments received on the Draft LUPA/EIS were similar to the issues raised during public scoping. In many cases, comments expressed a desire for very specific implementation level (project level) details to be included in the LUPA. As described in **Chapters 1** and **2**, the LUPA/EIS provides general guidance and identifies allowable uses and allocations but is not meant to address all details about individual projects. A separate environmental review will be conducted for specific projects at the implementation level to address these details. Some comments spanned several topical areas and included a discussion about a resource use or activity and listed concerns about the resources that would be impacted by the use, or conversely, the impact that restrictions would have on resource uses or activities.

Detailed summaries of public comments and responses, organized by resource, resource use, or EIS planning regulation, can be found in **Appendix X**, Response to Comments on the Draft Land Use Plan Amendment/Environmental Impact Statement. An overview of these summaries and responses can be found below in **Table 6.6**, Overview of Comments by Category. Comments related to editorial changes, out of scope topics, extension requests, and non-substantive comments were not included in the comment response effort.

Table 6.5
Number of Comments on the Draft LUPA/EIS by Category

Topic	Number of Comments
GRSG	293
NEPA	190
Leasable Minerals	132
Socioeconomics and Environmental Justice	83
Livestock Grazing	82
FLPMA	74
Wild Horse and Burros	51
Lands and Realty	39
Vegetation-Sagebrush	37
Predation	32
Travel Management	24
Other Laws	21
Recreation	11
Noise	11
Fire and Fuels	9
Water	9
Vegetation-Riparian	8
Wilderness Areas/WSAs	5
Air	4
Cultural Resources	4
Climate Change	3
Locatable Minerals	3
Weeds	3
ACECs	2
Fish and Wildlife	2
Soil Resources	2
Tribal Interest	2
National Trails	1
Visual Resources	1
Edits*	36
Out of scope*	298
Extension requests*	5
Total	**1,477**

*Comments in these categories were reviewed for their content, but not included in the comment response effort.

Table 6.6
Overview of Comments by Category

Topic	Overview
ACECs	Commenters noted that GRSG could be protected by administrative designations other than ACECs.
Climate change	Commenters claimed that the Draft LUPA/EIS did not adequately address the impacts of climate change in the southern part of the Panguitch Population area and the impacts of livestock grazing in conjunction with climate change on vegetation communities.
Fire and fuels	Commenters requested clarification on the potential impacts of the plan on fire conditions, suggested potential changes to alternatives or management actions, and provided additional references.
Fish and wildlife	Commenters requested that the USFWS Utah prairie dog focus area (under consideration) is excluded from GRSG population areas and GRSG management. They also noted that the Western banded gecko is not likely to occur in the Rich and Uintah population areas because its habitat is in the southwest part of Utah.
FLPMA	Commenters claimed that the Draft LUPA/EIS failed to comply with the multiple use mandate required under FLPMA and the Multiple Use Sustained Yield Act required under the Forest Service. They also noted that the plan is not consistent with state, local, and tribal plans and policies, and that there needs to be a consistency review with local plans in the document.
Greater Sage-Grouse	Commenters claimed the NTT report was inadequate to use as a primary source in the plan, claimed the COT report was flawed, the plan did not consider other existing guidance, requested clarification on the range of alternatives and habitat mapping, suggested additional literature to be used for best available information on GRSG, made recommendations on how to improve the impact analysis of various resources on GRSG, found the cumulative impacts to be deficient, and requested clarification or revisions to mitigation measures.
Lands and realty	Commenters requested clarification on or recommended specific changes to the alternatives, recommended additional references related to infrastructure and changes in land use, found the analysis of impacts between lands and realty management and renewable energy infrastructure to be lacking, recommended additional projects for consideration under cumulative impacts, and considered Appendix A to be inadequate.
Lands with wilderness characteristics	Commenters claimed that the Draft LUPA/EIS failed to meet the obligations in Manual 6320, undertaking the process required for the planning and management of lands with wilderness characteristics.
Leasable minerals	Commenters wanted certain aspects of the alternatives clarified, such as impacts on valid existing rights, the restrictions on leasable mineral development, and how the restrictions would protect the GRSG. Commenters also recommended additional literature, wanted a more complete analysis impacts and cumulative impacts, and voiced concerns over off-site mitigation.

Table 6.6
Overview of Comments by Category

Topic	Overview
Livestock grazing	Commenters argued that retiring grazing permits requires Congressional action, requested clarification on certain grazing terms and management actions, and requested that analysis include impacts of fencing specifically on checkerboard lands.
Locatable minerals	Commenters suggested that site specific conditions should be taken into account when prohibiting or allowing locatable mineral activities and argue that the Draft LUPA/EIS fails to analyze the cumulative impacts of locatable mineral withdrawals across the GRSG range.
NEPA	Commenters asserted that the plan does not comply with the requirements of NEPA, did not adequately notify the public about the Draft LUPA/EIS, did not coordinate with local agencies, did not provide a wide enough range of alternatives, did not use the best available data, and have not provided adequate cumulative impacts analysis or mitigation measures.
Noise	Commenters requested clarification on the methodology for measuring and determining the impacts of ambient noise levels.
Other Laws	Commenters argued that the plan does not comply with other federal laws.
Predation	Commenters questioned why the BLM and Forest Service did not include the threat of predation in the Draft LUPA/EIS.
Recreation	Commenters argued that various alternatives are inadequate to protect GRSG form the impacts of recreation, impacts of GRSG management on recreation were not adequately analyzed, and the Draft LUPA/EIS did not consider appropriate baseline recreation opportunities.
Socioeconomics	Commenters wanted the baseline data revised to include more current and relevant data, claimed the analysis used was at the wrong scale to make the information meaningful, and noted that the impacts analysis was inadequate in many ways.
Soil resources	Commenters stated that the impact analysis of livestock on soils is inadequate and request specific verification of the information and identification of any cropland within county boundaries.
Travel management	Commenters recommended that existing travel management plans and route networks are considered, restricted, or kept open, requested clarification about how this plan would apply to the pending Cedar City Field Office RMP revision, and suggest that the Draft LUPA/EIS fails to adequately identify specific or cumulative impacts from OHV uses.
Tribal interests	Commenters requested that populations of GRSG on tribal lands throughout the west be considered because they could impact anticipated USFWS action under the ESA.

Table 6.6
Overview of Comments by Category

Topic	Overview
Vegetation – riparian	Commenters claimed that the Draft LUPA/EIS failed to adequately address riparian conditions, analyze the impacts of water developments on riparian areas, and requested that the Final LUPA/EIS note that current proper functioning condition assessment methods would be modified to incorporate GRSG needs.
Vegetation – sagebrush	Commenters voiced concern about pinyon-juniper expansion and the spread of invasive species into sagebrush ecosystems; requested additional baseline information and more accurate mapping of habitat, and requested clarification for mitigation measures and monitoring programs.
Water resources	Commenters stated that BLM cannot violate Utah laws, requested more stringent and expanded assessment of rangeland health and proper functioning condition, requested that the impacts on water from eroding soil and manure be analyzed for each alternative. They also requested additional literature supporting that fluid mineral development can have adverse impacts on water quality, and a description of how pinyon-juniper encroachment affects water resources.
Wild horses and burros	Commenters noted that wild horses and burros were not adequately protected, that forage for livestock and wild horses and burros should not be combined, the impacts analysis was insufficient, and request additional analysis of the impacts GRSG management will have on wild horses and burros.

6.7.5 Future Public Involvement

Public participation efforts will be ongoing throughout the remainder of the LUPA process. One substantial part of this effort is the opportunity for members of the public to comment on the Draft LUPA/EIS during the comment period. This Proposed LUPA/Final EIS responds to all substantive comments received during the 90-day comment period. A Proposed LUPA and Final EIS will be provided for a 30-day period providing the public opportunity to protest proposals. A Governor's Consistency Review will occur concurrent with this protest period. Such protests will be addressed in the RODs and necessary adjustments may be made to the LUPA. RODs will then be issued by the BLM and the Forest Service after the release of the Proposed LUPA/Final EIS, the Governor's Consistency Review, and any resolution of protests received on the Proposed LUPA/Final EIS.

6.8 LIST OF PREPARERS

This LUPA/EIS was prepared by an interdisciplinary team of staff from the BLM, Forest Service, Environmental Management and Planning Solutions, Inc., and ICF International (see **Table 6.7**, Preparers). In addition, staff from numerous federal, state, and local agencies, and nonprofit organizations contributed to developing the LUPA/EIS.

Table 6.7
Preparers

Name	Role/Responsibility
BLM	
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Dave Jeppesen	Recreation and Visitor Services, Comprehensive Trails and Travel Management
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Table 6.7
Preparers

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Tim Metzger	Wildland Fire Ecology
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Table 6.7
Preparers

Name	Role/Responsibility
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References

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Glossary

GLOSSARY

2008 Western Association of Fish and Wildlife Agencies (WAFWA) Sage-grouse Memorandum of Understanding. A memorandum of understanding among WAFWA, Forest Service, BLM, USFWS, USGS, NRCS, and the US Department of Agriculture, Farm Service Agency. The purpose of the memorandum of understanding is to provide for cooperation among the participating state and federal land, wildlife management and science agencies in the conservation and management of sage-grouse (*Centrocercus urophasianus*) sagebrush (*Artemisia* spp.) habitats and other sagebrush-dependent wildlife throughout the western US and Canada and a commitment of all agencies to implement the 2006 WAFWA Conservation Strategy.

2011 Partnership Memorandum of Understanding. A partnership agreement among the NRCS, Forest Service, BLM, and USFWS in 2011. This memorandum of understanding is for range management – to implement NRCS practices on adjacent federal properties.

Acquisition. Acquisition of lands can be pursued to facilitate various resource management objectives. Acquisitions, including easements, can be completed through exchange, Land and Water Conservation Fund purchases, donations, or receipts from the Federal Land Transaction Facilitation Act sales or exchanges.

Activity plan. A type of implementation plan (see *Implementation plan*); an activity plan usually describes multiple projects and applies best management practices to meet land use plan objectives. Examples of activity plans include interdisciplinary management plans, habitat management plans, recreation area management plans, and grazing plans.

Actual use. The amount of animal unit months consumed by livestock based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks.

Adaptive management. A type of natural resource management in which decisions are made as part of an ongoing science-based process. Adaptive management involves testing, monitoring, and evaluating applied strategies, and incorporating new knowledge into management

approaches that are based on scientific findings and the needs of society. Results are used to modify management policy, strategies, and practices.

Administrative access. A term used to describe access for resource management and administrative purposes such as fire suppression, cadastral surveys, permit compliance, law enforcement and military in the performance of their official duty, or other access needed to administer BLM and National Forest System lands or uses.

Air basin. A land area with generally similar meteorological and geographic conditions throughout. To the extent possible, air basin boundaries are defined along political boundary lines and include both the source and receptor areas.

Air pollution. Degradation of air quality resulting from unwanted chemicals or other materials occurring in the air.

Allotment. An area of land in which one or more livestock operators graze their livestock. Allotments generally consist of BLM-administered or National Forest System lands but may include other federally managed, state-owned, and private lands. An allotment may include or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment management plan. A document prepared in consultation with the lessees or permittees involved. It documents a program developed as an activity plan that focuses on, and contains the necessary instructions for, the management of livestock grazing on specified public lands to meet resource condition, sustained yield, multiple use, economic, and other objectives. See FLPMA Section 103(k) and 43 CFR 4100.0-5.

Alluvial soil. A soil developing from recently deposited alluvium and exhibiting essentially no horizon development or modification of the recently deposited materials.

Alluvium. Clay, silt, sand, gravel, or other rock materials transported by moving water. Deposited in comparatively recent geologic time as sorted or semi-sorted sediment in rivers, floodplains, lakes, and shores, and in fans at the base of mountain slopes.

Ambient air quality. The state of the atmosphere at ground level as defined by the range of measured and/or predicted ambient concentrations of all significant pollutants for all averaging periods of interest.

Amendment. The process for considering or making changes in the terms, conditions, and decisions of approved land use plans.

Animal unit month (AUM). The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

Anthropogenic disturbances. Features include but are not limited to paved highways, graded gravel roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills, agricultural conversion, homes, and mines.

Aquatic. Living or growing in or on the water.

Area of Critical Environmental Concern (ACEC). Special area designation established through the BLM's land use planning process (43 CFR 1610.7-2). To be considered as an ACEC, the area must meet the relevance and importance criteria in 43 CFR 1610.7-2(a) and require special management (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. The level of allowable use within an ACEC is established through the collaborative planning process. Designation of an ACEC allows for resource use limitations in order to protect identified resources or values.

Atmospheric deposition. Air pollution produced when acid chemicals are incorporated into rain, snow, fog, or mist and fall to the earth. Sometimes referred to as "acid rain" and comes from sulfur oxides and nitrogen oxides, products of burning coal and other fuels and from certain industrial processes. If the acid chemicals in the air are blown into the area where the weather is wet, the acids can fall to earth in the rain, snow, fog, or mist. In areas where the weather is dry, the acid chemicals may become incorporated into dust or smoke.

Attainment area. A geographic area in which levels of a criteria air pollutant meet the health-based National Ambient Air Quality Standard for that specific pollutant.

Authorized /authorized use. An activity (i.e., resource use) occurring on public lands that is both explicitly or implicitly recognized and legalized by law or regulation. This term may refer to those activities occurring on the public lands for which the BLM, Forest Service, or other appropriate authority (e.g., Congress for RS 2477 rights-of-way, Federal Energy Regulatory Commission for major, interstate rights-of-way), has issued a formal authorization document (e.g., livestock grazing lease/permit; right-of-way grant; coal lease; oil and gas permit to drill; etc.). Formally authorized uses typically involve some type of commercial activity, facility placement, or event. These formally authorized uses are often spatially or temporally limited. Unless constrained or bounded by statute, regulation, or an approved land use plan decision, legal activities involving public enjoyment and use of the public lands (e.g., hiking, camping, hunting, etc.) require no formal BLM or Forest Service authorization.

Avoidance/avoidance area. These terms usually address mitigation of some activity (i.e., resource use). Paraphrasing the CEQ regulations (40 CFR 1508.20), avoidance means to circumvent, or bypass, an impact altogether by not taking a certain action, or parts of an action. Therefore, the term "avoidance" does not necessarily prohibit a proposed activity, but it may require the relocation of an action, or the total redesign of an action to eliminate any potential impacts resulting from it. Also see *"right-of-way avoidance area"* definition.

Baseline. The pre-existing condition of a defined area and/or resource that can be quantified by an appropriate metric(s). During environmental reviews, the baseline is considered the affected environment that exists at the time of the review's initiation, and is used to compare predictions of the effects of the proposed action or a range of reasonable alternatives.

Best management practices (BMPs). A suite of techniques that guide or may be applied to management actions to aide in achieving desired outcomes. BMPs are often developed in

conjunction with land use plans, but they are not considered a planning decision unless the plans specify that they are mandatory.

Big game. Indigenous, ungulate (hoofed) wildlife species that are hunted, such as elk, deer, bison, bighorn sheep, and pronghorn antelope.

Biodiversity (biological diversity). The variety of life and its processes, and the interrelationships within and among various levels of ecological organization. Conservation, protection, and restoration of biological species and genetic diversity are needed to sustain the health of existing biological systems. Federal resource management agencies must examine the implications of management actions and development decisions on regional and local biodiversity.

Biological soil crust. A complex association between soil particles and cyanobacteria, algae, microfungi, lichens, and bryophytes that live within or atop the uppermost millimeters of soil.

Biologically significant unit (BSU). A geographical/spatial area within GRSG habitat that contains the relevant habitats which are used by GRSG. Biologically significant units are PHMA within a geographic area in Utah identified as the population area. A biologically significant unit or subset of the unit is only used in the calculation of the anthropogenic disturbance threshold and in the adaptive management habitat trigger.

BLM Sensitive Species. Those species that are not federally listed as endangered, threatened, or proposed under the ESA, but that are designated by the BLM State Director under 16 USC 1536(a)(2) for special management consideration. By national policy, federally listed candidate species are automatically included as sensitive species. Sensitive species are managed so they will not need to be listed as proposed, threatened, or endangered under the ESA.

Candidate species. Taxa for which the USFWS has sufficient information on their status and threats to propose the species for listing as endangered or threatened under the ESA, but for which issuance of a proposed rule is currently precluded by higher priority listing actions. Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register (BLM Manual 6840, Special Status Species Manual).

Casual Use. Casual use means activities ordinarily resulting in no or negligible disturbance of the public lands, resources, or improvements. For examples for rights-of-ways, see 43 CFR 2801.5. For examples for locatable minerals, see 43 CFR 3809.5.

Categorical exclusion. A category of actions (identified in agency guidance) that do not individually or cumulatively have a significant effect on the human environment, and for which neither an environmental assessment nor an environmental impact statement is required (40 CFR 1508.4), but a limited form of NEPA analysis is performed.

Checkerboard. This term refers to a land ownership pattern of alternating sections of federally owned lands with private- or state-owned lands for 20 miles on either side of a land grant railroad (e.g., Union Pacific, Northern Pacific, etc.). On land status maps, this alternating

ownership is either delineated by color coding or alphabetic code resulting in a "checkerboard" visual pattern.

Chemical vegetation treatment. Application of herbicides to control invasive species/noxious weeds and/or unwanted vegetation. To meet resource objectives the preponderance of chemical treatments would be used in areas where cheatgrass or noxious weeds have invaded sagebrush steppe.

Clean Air Act of 1963 (as amended). Federal legislation governing air pollution control.

Clean Water Act of 1972 (as amended). Federal legislation governing water pollution control.

Climate change. Any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from:

- natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation); and
- human activities that change the atmosphere's composition (e.g., driving automobiles) and the land surface (e.g., deforestation, reforestation, urbanization, and desertification).

Closed area. An area where one or more uses are prohibited either temporarily or over the long term. Areas may be closed to uses such as, but not limited to, off-road vehicles, mineral leasing, mineral or vegetative material collection, or target shooting. In off-road vehicle use closed areas, motorized and mechanized off-road vehicle use is prohibited. Use of motorized and mechanized off-road vehicles in closed areas may be allowed for certain reasons; however, such use shall be made only with the approval of the authorized officer (43 CFR 8340.0-5).

Collocation (communication sites). The installation of new equipment/facilities on or within or adjacent to existing authorized equipment/facilities or within a communication site boundary as designated in the Communication Site Plan.

Collocation (electrical lines). Installation of new rights-of-way adjacent to current ROWs boundaries, not necessarily placed on the same power poles.

Collocation (designated corridors). The installation of new rights-of-way within the existing corridor or adjacent to the existing corridor.

Collocation (other rights-of-way). The installation of new rights-of-way within the existing footprint of an approved ROW boundary or adjacent to an approved ROW boundary.

Collaboration. A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other

lands. Collaboration may take place with any interested parties, whether or not they are a cooperating agency.

Communication site. Sites that include broadcast types of uses (e.g., television, AM/FM radio, cable television, broadcast translator) and non-broadcast uses (e.g., commercial or private mobile radio service, cellular telephone, microwave, local exchange network, passive reflector).

Compensatory mitigation. Compensating for the residual impact of a certain action or parts of an action by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects. The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g. chemical vegetation treatments, land acquisitions, conservation easements).

Comprehensive trails and travel management. The proactive interdisciplinary planning; on-the-ground management and administration of travel networks (both motorized and non-motorized) to ensure public access, natural resources, and regulatory needs are considered. It consists of inventory, planning, designation, implementation, education, enforcement, monitoring, easement acquisition, mapping and signing, and other measures necessary to provide access to public lands for a wide variety of uses (including uses for recreational, traditional, casual, agricultural, commercial, educational, landing strips, and other purposes).

Condition class (fire regimes). Fire regime condition classes are a measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects or disease, or other management activities.

Condition of approval. Conditions of approval are conditions or provisions (requirements) under which a permit is approved, after a lease is issued. Conditions of approval are based on site-specific analysis and are designed to minimize, mitigate, or prevent impacts on resource values or other uses of public lands.

Conformance. A proposed action shall be specifically provided for in the land use plan or, if not specifically mentioned, shall be clearly consistent with the goals, objectives, or standards of the approved land use plan.

Conservation measures. Measures to conserve, enhance, and/or restore Greater Sage-Grouse habitat by reducing, eliminating, or minimizing threats to that habitat.

Conservation plan. The recorded decisions of a landowner or operator, cooperating with a conservation district, on how the landowner or operator plans, within practical limits, to use his/her land according to its capability and to treat it according to its needs for maintenance or improvement of the soil, water, animal, plant, and air resources.

Conservation strategy. A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM sensitive species or that have been determined by the USFWS or National Oceanographic and Atmospheric Administration-Fisheries to be federal candidates under the Endangered Species Act.

Controlled surface use (CSU). CSU is a category of moderate constraint stipulations that allows some use and occupancy of public land while protecting identified resources or values and is applicable to fluid mineral leasing and all activities associated with fluid mineral leasing (e.g., truck-mounted drilling and geophysical exploration equipment off designated routes, construction of wells and/or pads). On BLM-administered lands, CSU areas are open to fluid mineral leasing but the stipulation allows the BLM to require special operational constraints, or the activity can be shifted more than 200 meters (656 feet) to protect the specified resource or value.

Cooperating agency. Assists the lead federal agency in developing an environmental assessment or environmental impact statement. These can be any agency with jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any tribe or Federal, State, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

Council on Environmental Quality. An advisory council to the President of the US established by the National Environmental Policy Act of 1969. It reviews federal programs to analyze and interpret environmental trends and information.

Criteria pollutant. The US Environmental Protection Agency uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards. The criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter and lead.

Crucial wildlife habitat. The environment essential to plant or animal biodiversity and conservation at the landscape level. Crucial habitats include, but are not limited to, biological core areas, severe winter range, winter concentration areas, reproduction areas, and movement corridors. These areas are often identified by the State Division of Wildlife Resources.

Cultural resources. Locations of human activity, occupation, or use. Cultural resources include archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and locations of traditional cultural or religious importance to specified social and/or cultural groups.

Cumulative effects. The direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action.

Decision area. The decision area includes lands within the planning area for which the BLM and Forest Service have authority to make management decisions. The BLM and Forest Service have jurisdiction over all BLM-administered and National Forest System lands. In addition the BLM has jurisdiction over federal minerals in some areas where the surface is owned by a non-federal entity. The decision area for this project includes all GRSG occupied habitat administered by BLM or Forest Service including non-federal lands where there are federal mineral interests.

Deferred/deferred use. To set-aside, or postpone, a particular resource use(s) or activity(ies) on the public lands to a later time. Generally when this term is used the period of the deferral is specified. Deferments sometimes follow the sequence timeframe of associated serial actions (e.g., action B will be deferred until action A is completed, etc.).

Degraded vegetation. Areas where the plant community is not complete or is under threat. Examples include missing components such as perennial forbs or cool season grasses, weed infestations, or lack of regeneration of key species such as sagebrush or cottonwoods trees.

Designated roads and trails. Specific roads and trails identified by the BLM (or other agency) where some type of motorized/nonmotorized use is appropriate and allowed, either seasonally or yearlong (H-1601-1, BLM Land Use Planning Handbook). The action of designating specific routes for specific uses is done during implementation-level planning. The action of designating areas where travel will be limited to designated routes is a land use plan-level decision.

Desired condition. A description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates.

Desired future condition. For rangeland vegetation, the condition of rangeland resources on a landscape scale that meet management objectives. It is based on ecological, social, and economic considerations during the land planning process. It is usually expressed as ecological status or management status of vegetation (species composition, habitat diversity, and age and size class of species) and desired soil qualities (soil cover, erosion, and compaction). In a general context, desired future condition is a portrayal of the land or resource conditions that are expected to result if goals and objectives are fully achieved.

Desired outcomes. A type of land use plan decision expressed as a goal or objective.

Direct impacts. Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place.

Directional drilling. A drilling technique whereby a well is deliberately deviated from the vertical in order to reach a particular part of the oil- or gas-bearing reservoir. Directional drilling technology enables the driller to steer the drill stem and bit to a desired bottom hole location. Directional wells initially are drilled straight down to a predetermined depth and then gradually curved at one or more different points to penetrate one or more given target

reservoirs. This specialized drilling usually is accomplished with the use of a fluid-driven downhole motor, which turns the drill bit. Directional drilling also allows multiple production and injection wells to be drilled from a single surface location such as a gravel pad, thus minimizing cost and the surface impact of oil and gas drilling, production, and transportation facilities. It can be used to reach a target located beneath an environmentally sensitive area (Alaska Department of Natural Resources, Division of Oil and Gas 2009).

Disposal lands. Transfer of public land out of federal ownership to another party through sale, exchange, Recreation and Public Purposes Act of 1926, Desert Land Entry or other land law statutes.

Disruptive activities. Those public land resource uses/activities that are likely to alter the behavior, displace, or cause excessive stress to existing animal or human populations occurring at a specific location and/or time. In this context, disruptive activity(ies) refers to those actions that alter behavior or cause the displacement of individuals such that reproductive success is negatively affected, or an individual's physiological ability to cope with environmental stress is compromised. This term does not apply to the physical disturbance of the land surface, vegetation, or features. When administered as a land use restriction (e.g., *No Disruptive Activities*), this term may prohibit or limit the physical presence of sound above ambient levels, light beyond background levels, and/or the nearness of people and their activities. The term is commonly used in conjunction with protecting wildlife during crucial life stages (e.g., breeding, nesting, birthing, etc.), although it could apply to any resource value on the public lands. The use of this land use restriction is not intended to prohibit all activity or authorized uses.

Diversity. The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

Easement. A right afforded a person or agency to make limited use of another's real property for access or other purposes.

Ecological site. A distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

Emergency stabilization. Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. Emergency stabilization actions must be taken within one year following containment of a wildfire.

Endangered species. Any species that is in danger of extinction throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Manual). Under the Endangered Species Act in the US, "endangered" is the more-protected of the two categories. Designation as endangered (or threatened) is determined by USFWS as directed by the Endangered Species Act.

Endangered Species Act of 1973 (as amended) (ESA). Designed to protect critically imperiled species from extinction because of economic growth and development untempered by

adequate concern and conservation. The ESA is administered by two federal agencies, USFWS and the National Oceanic and Atmospheric Administration. The purpose of the ESA is to protect species and the ecosystems upon which they depend (16 US Code 1531-1544).

Enhance. The improvement of habitat by increasing missing or modifying unsatisfactory components and/or attributes of the plant community to meet GRSG objectives.

Environmental assessment. A concise public document prepared to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. It includes a brief discussion of the need for the proposal, alternatives considered, environmental impact of the proposed action and alternatives, and a list of agencies and individuals consulted.

Environmental impact statement (EIS). A detailed statement prepared by the responsible official in which a major federal action that significantly affects the quality of the human environment is described, alternatives to the proposed action are provided, and effects are analyzed.

Evaluation (plan evaluation). The process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and National Environmental Policy Act of 1969 analysis are still valid and whether the plan is being implemented.

Exchange. A transaction whereby the federal government receives land or interests in land in exchange for other land or interests in land.

Exclusion areas. An area on the public lands where a certain activity(ies) is prohibited to insure protection of other resource values present on the site. The term is frequently used in reference to lands/realty actions and proposals (e.g., rights-of-way, etc.), but is not unique to lands and realty program activities. This restriction is functionally analogous to the phrase "no surface occupancy" used by the oil and gas program, and is applied as an absolute condition to those affected activities. The less restrictive analogous term is avoidance area. Also see *"right-of-way exclusion area"* definition.

Existing routes. The roads, trails, or ways that are used by motorized vehicles (jeeps, all-terrain vehicles, motorized dirt bikes, etc.), mechanized uses (mountain bikes, wheelbarrows, game carts), pedestrians (hikers), and/or equestrians (horseback riders) and are, to the best of BLM's knowledge, in existence at the time of RMP/EIS publication.

Exploration. Active drilling, geophysical operations, surface sampling and trenching, or small-scale mining or similar activities, to:

a. Determine the presence of the mineral resource; or

b. Determine the extent of the reservoir or mineral deposit.

Extensive recreation management area (ERMA). Administrative units that require specific management consideration in order to address recreation use, demand, or Recreation

and Visitor Services program investments. ERMAs are managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. ERMA management is commensurate and considered in context with the management of other resources and resource uses.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579, October 21, 1976, often referred to as the BLM's "Organic Act," which provides most of the BLM's legislated authority, direction policy, and basic management guidance.

Federal mineral estate. Subsurface mineral estate owned by the US and administered by the BLM. Federal mineral estate under BLM jurisdiction is composed of mineral estate underlying BLM lands, tribal lands, privately owned lands, and state-owned lands

Federal mineral interest. See *Federal mineral estate.*

Fire frequency. A general term referring to the recurrence of fire in a given area over time.

Fire management plan. A plan that identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire, prescribed fire, and wildland fire use). The plan is supplemented by operational plans including, but not limited to, preparedness plans, preplanned dispatch plans, and prevention plans. Fire management plans assure that wildland fire management goals and components are coordinated.

Fire Regime Condition Classification System. Measures the extent to which vegetation departs from reference conditions, or how the current vegetation differs from a particular reference condition.

Fire suppression. All work and activities connected with control and fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

Fluid minerals. Oil, gas, coal bed natural gas, and geothermal resources.

Forage. All browse and herbaceous foods that are available to grazing animals.

Forage base. The amount of vegetation available for wildlife and livestock use.

Forest Service sensitive species. Those plant and animal species identified by a regional forester for which population viability is a concern, as evidenced by (from Forest Service Manual 2600 Chapter 2670):

- Significant current or predicted downward trends in population numbers or density.
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Fragile soils. Soils having a shallow depth to bedrock, minimal surface layer of organic material, textures that are more easily detached and eroded, or are on slopes over 35 percent.

Fuelbreak. A natural or manmade change in fuel characteristics which effects fire behavior so that fires burning into them can be more readily controlled.

Fugitive dust. Significant atmospheric dust arises from the mechanical disturbance of granular material exposed to the air. Dust generated from these open sources is termed "fugitive" because it is not discharged to the atmosphere in a confined flow stream. Common sources of fugitive dust include unpaved roads, agricultural tilling operations, aggregate storage piles, and heavy construction operations.

General Greater Sage-Grouse habitat. GRSG habitat that is occupied (seasonal or year-round) habitat outside of priority habitat.

Geographic Information System (GIS). A system of computer hardware, software, data, people, and applications that capture, store, edit, analyze, and display a potentially wide array of geospatial information.

Geophysical exploration. Efforts to locate or better define mineral or oil and gas deposits, using geophysical methods such as seismic refraction, electrical resistivity, induced magnetism, or other methods.

Geothermal energy. Natural heat from within the Earth captured for production of electric power, space heating, or industrial steam.

Goal. A broad statement of a desired outcome; usually not quantifiable and may not have established timeframes for achievement.

Grandfathered right. The right to use in a non-conforming manner due to existence prior to the establishment of conforming terms and conditions.

Grazing preference. Grazing preference or preference means a superior or priority position against others for the purpose of receiving a grazing permit or lease. This priority is attached to base property owned or controlled by the permittee or lessee (43 CFR 4100.0-5).

Grazing system. Scheduled grazing use and non-use of an allotment to reach identified goals or objectives by improving the quality and quantity of vegetation. Include, but are not limited to, developing pastures, utilization levels, grazing rotations, timing and duration of use periods, and necessary range improvements.

Groundwater. Water held underground in soil or permeable rock, often feeding springs and wells.

Guidelines. Actions or management practices that may be used to achieve desired outcomes, sometimes expressed as BMPs. Guidelines may be identified during the land use planning process, but they are not considered a land use plan decision unless the plan specifies that they are mandatory. For the BLM, guidelines for grazing administration must conform to 43 CFR 4180.2.

Habitat. An environment that meets a specific set of physical, biological, temporal, or spatial characteristics that satisfy the requirements of a plant or animal species or group of species for part or all of their life cycle.

Hazardous material. A substance, pollutant, or contaminant that, due to its quantity, concentration, or physical or chemical characteristics, poses a potential hazard to human health and safety or to the environment if released into the workplace or the environment.

Impact. The effect, influence, alteration, or imprint caused by an action.

Implementation decisions. Decisions that take action to implement land use planning; generally appealable to Interior Board of Land Appeals under 43 CFR 4.410.

Implementation plan. An area or site-specific plan written to implement decisions made in a land use plan. Implementation plans include both activity plans and project plans.

Indicators. Factors that describe resource condition and change and can help determine trends over time.

Indirect impacts. Indirect impacts result from implementing an action or alternative but usually occur later in time or are removed in distance and are reasonably certain to occur.

Intermittent stream. An intermittent stream is a stream that flows only at certain times of the year when it receives water from springs or from some surface sources such as melting snow in mountainous areas. During the dry season and throughout minor drought periods, these streams will not exhibit flow. Geomorphological characteristics are not well defined and are often inconspicuous. In the absence of external limiting factors, such as pollution and thermal modifications, species are scarce and adapted to the wet and dry conditions of the fluctuating water level.

Invertebrate. An animal lacking a backbone or spinal column, such as insects, snails, and worms. The group includes 97 percent of all animal species.

Key wildlife ecosystems. Specific areas within the geographic area occupied by a species in which are found those physical and biological features 1) essential to the conservation of the species, and 2) which may require special management considerations or protection.

Land health condition. A classification for land health which includes these categories: "Meeting Land Health Standard(s)" and "Not Meeting Land Health Standard(s)".

- Meeting Land Health Standard(s): Lands for which health indicators are currently in acceptable condition such that basic levels of ecological processes and functions are in place. This rating includes the following subcategories:
  - Fully Meeting Standard(s): Lands for which there are no substantive concerns with health indicators
  - Exceeding Standard(s): Lands for which health indicators are in substantially better conditions than acceptable levels.

  - Meeting Standard(s) with Problems: Lands which have one or more concerns with health indicators to the degree that they are categorized as meeting the Land Health Standards, but have some issues which make them at risk of becoming "not meeting."
- Not Meeting Land Health Standard(s): Lands for which one or more health indicators are in unacceptable conditions such that basic levels of ecological processes and functions are no longer in place.

Land health trend is used to describe these classes further. It includes these categories: upward, static, and downward.

- Upward Trend: lands which have shown improving indicator conditions over time.
- Static Trend: lands which have shown no clear improvement or decline in indicator conditions over time.
- Downward Trend: lands which have shown declining indicator conditions over time.

Land and resource management plan (LRMP) (land management plan). A plan developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands of a given national forest. A Forest Service land use plan. See definition for *land use plan*.

Land tenure adjustments. Land ownership or jurisdictional changes. To improve the manageability of BLM-administered lands and their usefulness to the public, the BLM has numerous authorities for repositioning lands into a more consolidated pattern, disposing of lands, and entering into cooperative management agreements. These land pattern improvements are completed primarily through the use of land exchanges but also through land sales, through jurisdictional transfers to other agencies, and through the use of cooperative management agreements and leases. (BLM)

Landownership adjustments. Land adjustments to National Forest System lands by purchase, exchange, interchange, or conveyance under authority delegated by law to the Secretary of Agriculture. (Forest Service)

Land treatment. All methods of artificial range improvement arid soil stabilization such as reseeding, brush control (chemical and mechanical), pitting, furrowing, water spreading, etc.

Land use allocation. The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions (H-1601-1, BLM Land Use Planning Handbook).

Land use plan. A set of decisions that establish management direction for land within an administrative area. The generic term includes both BLM RMPs and Forest Service LRMPs.

Land use plan decision. Establishes desired outcomes and actions needed to achieve them. Decisions are reached using the planning process in 43 CFR 1600. When they are presented to

the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to Interior Board of Land Appeals.

Late brood-rearing area. Habitat includes mesic sagebrush and mixed shrub communities, wet meadows, and riparian habitats as well as some agricultural lands (e.g., alfalfa fields, etc.).

Leasable minerals. Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. These include energy-related mineral resources such as oil, natural gas, coal, and geothermal, and some nonenergy minerals, such as phosphate, sodium, potassium, and sulfur. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

Lease. Section 302 of the Federal Land Policy and Management Act of 1976 provides the BLM's authority to issue leases for the use, occupancy, and development of public lands. Leases are issued for purposes such as a commercial filming, advertising displays, commercial or noncommercial croplands, apiaries, livestock holding or feeding areas not related to grazing permits and leases, native or introduced species harvesting, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, ski resorts, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and nonirrigation facilities. The regulations establishing procedures for processing these leases and permits are found in 43 CFR 2920. (BLM)

Lease. A type of special use authorization (usually granted for uses other than linear rights-of-way) that is used when substantial capital investment is required and when conveyance of a conditional and transferable interest in National Forest System lands is necessary or desirable to serve or facilitate authorized long-term uses, and that may be revocable and compensable according to its terms. (Forest Service)

Lease stipulation. A modification of the terms and conditions on a standard mineral lease form established at the time of the lease sale.

Lessee. A person or entity authorized to use and occupy National Forest System land under a specific instrument identified as a lease. Forest special use leases are limited to authorize certain wireless communication uses. Leases are also used for certain mineral leasable activities.

Lek. A traditional courtship display area attended by male sage-grouse in or adjacent to sagebrush dominated habitat. A lek is designated based on observations of two or more male sage-grouse engaged in courtship displays. Sub-dominant males may display on itinerant strutting areas during population peaks. Such areas usually fail to become established leks. Therefore, a site where less than five males are observed strutting should be confirmed active for two years before meeting the definition of a lek (Connelly et al. 2000, 2003, 2004). Each state may have a slightly different definition of lek, active lek, inactive lek, occupied lek, and unoccupied leks. Regional planning will use the appropriate definition provided by the state of interest. Leks can be different shapes, may move, and may change size year to year. When specific information is available for lek edges that information would be used for determining management buffers.

When no specific information is available for lek edges and only lek point data are available, that information would be used for determining management buffers.

Lek Complex. A lek or group of leks within 2.5 kilometers (1.5 miles) of each other between which male sage-grouse may interchange from one day to the next. Fidelity to leks has been well documented. Visits to multiple leks are most common among yearlings and less frequent for adult males, suggesting an age-related period of establishment (Connelly et al. 2004).

Active Lek. Any lek that has been attended by male sage-grouse during the strutting season.

Inactive Lek. Any lek where sufficient data suggests that there was no strutting activity throughout a strutting season. Absence of strutting sage-grouse during a single visit is insufficient documentation to establish that a lek is inactive. This designation requires documentation of either: 1) an absence of sage-grouses on the lek during at least 2 ground surveys separated by at least seven days. These surveys must be conducted under ideal conditions (April 1-May 7 (or other appropriate date based on local conditions), no precipitation, light or no wind, half-hour before sunrise to one hour after sunrise) or 2) a ground check of the exact known lek site late in the strutting season (after April 15) that fails to find any sign (tracks, droppings, feathers) of strutting activity. Data collected by aerial surveys should not be used to designate inactive status as the aerial survey may actually disrupt activities.

Occupied Lek. A lek that has been active during at least one strutting season within the prior 10 years.

Unoccupied Lek. A lek that has either been "destroyed" or "abandoned."

Destroyed Lek. A formerly active lek site and surrounding sagebrush habitat that has been destroyed and is no longer suitable for sage-grouse breeding.

Abandoned Lek. A lek in otherwise suitable habitat that has not been active during a period of 10 consecutive years. To be designated abandoned, a lek must be "inactive" (see above criteria) in at least four non-consecutive strutting seasons spanning the 10 years. The site of an "abandoned" lek should be surveyed at least once every 10 years to determine whether it has been re-occupied by sage-grouse.

Lentic. Pertaining to standing water, such as lakes and ponds.

Limited area. Motorized vehicle travel within specified areas and/or on designated routes, roads, vehicle ways, or trails is subject to restrictions. The limited designation is used where OHV use must be restricted to meet specific resource management objectives. Examples of limitations include number or type of vehicles; time or season of use; permitted or licensed use only; use limited to designated roads and trails; or other limitations if restrictions are necessary to meet resource management objectives, including certain competitive or intensive use areas

that have special limitations (see 43 CFR 8340.0-5) (BLM Manual 1626, Travel and Transportation Manual).

Locatable minerals. Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Long-term effect. The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more.

Lotic. Pertaining to moving water, such as streams or rivers.

Management decision. A decision made by the BLM or Forest Service to manage public lands. Management decisions include both land use plan decisions and implementation decisions.

Management zone. *See Western Association of Fish and Wildlife Agencies (WAFWA) Management Zones.*

Master Development Plans. A set of information common to multiple planned wells, including drilling plans, Surface Use Plans of Operations, and plans for future production.

Mechanized transport. Any vehicle, device, or contrivance for moving people or material in or over land, water, snow, or air that has moving parts.

Mineral. Any naturally formed inorganic material, solid or fluid inorganic substance that can be extracted from the earth, any of various naturally occurring homogeneous substances (as stone, coal, salt, sulfur, sand, petroleum, water, or natural gas) obtained usually from the ground. Under federal laws, considered as locatable (subject to the general mining laws), leasable (subject to the Mineral Leasing Act of 1920), and salable (subject to the Materials Act of 1947).

Mineral entry. The filing of a claim on public land to obtain the right to any locatable minerals it may contain.

Mineral estate. The ownership of minerals, including rights necessary for access, exploration, development, mining, ore dressing, and transportation operations.

Mineralize. The process where a substance is converted from an organic substance to an inorganic substance.

Mineral materials. Common varieties of mineral materials such as soil, sand and gravel, stone, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be acquired under the Materials Act of 1947, as amended.

Minimization. Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Mining claim. A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A

mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, millsite, and tunnel site.

Mining Law of 1872, as amended. Provides for claiming and gaining title to locatable minerals on public lands. Also referred to as the "Mining Law."

Mitigation. Includes specific means, measures or practices that could reduce, avoid, or eliminate adverse impacts. Mitigation can include avoiding the impact altogether by not taking a certain action or parts of an action, minimizing the impact by limiting the degree of magnitude of the action and its implementation, rectifying the impact by repairing, rehabilitation, or restoring the affected environment, reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and compensating for the impact by replacing or providing substitute resources or environments.

Modification. A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Monitoring (plan monitoring). The process of tracking the implementation of land use plan decisions and collecting and assessing data necessary to evaluate the effectiveness of land use planning decisions.

Motorized vehicles or uses. Vehicles that are motorized, including but not limited to jeeps, all-terrain vehicles (all-terrain vehicles, such as four-wheelers and three-wheelers), trail motorcycles or dirt bikes, and aircrafts.

Multiple-use. The management of the public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (FLPMA) (BLM Manual 6840, Special Status Species Manual).

Municipal watershed. A watershed area that provides water for use by a municipality as defined by the community and accepted by the State.

National Environmental Policy Act of 1969 (NEPA). Public Law 91-190. Establishes environmental policy for the nation. Among other items, NEPA requires federal agencies to consider environmental values in decision-making processes.

National Register of Historic Places. A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance, established by the Historic Preservation Act of, 1966 and maintained by the National Park Service.

Native vegetation. Plant species which were found here prior to European settlement, and consequently are in balance with these ecosystems because they have well developed parasites, predators, and pollinators.

Natural processes. Fire, drought, insect and disease outbreaks, flooding, and other events which existed prior to European settlement, and shaped vegetation composition and structure.

Net conservation gain. The actual benefit or gain above baseline conditions. Actions which result in habitat loss and degradation include those identified as threats which contribute to GRSG disturbance as identified by the USFWS in its 2010 listing decision (75 *Federal Register* 13910) and shown in Table C.2 in the Greater Sage-Grouse Monitoring Framework (Appendix C of the Utah Greater Sage-Grouse Proposed LUPA/Final EIS). Exceptions to net conservation gain for GRSG may be made for vegetation treatments to benefit Utah prairie dog.

Nonenergy leasable minerals. Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. Nonenergy minerals include resources such as phosphate, sodium, potassium, and sulfur.

Nonfunctional condition. Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate energies associated with flow events, and thus are not reducing erosion, improving water quality, etc.

Non-habitat. Lands within management areas that do not contribute to the annual life-cycle of GRSG.

No surface occupancy (NSO). A major constraint where use or occupancy of the land surface for fluid mineral exploration or development and all activities associated with fluid mineral leasing (e.g., truck-mounted drilling and geophysical exploration equipment off designated routes, construction of wells and/or pads) are prohibited to protect identified resource values. Areas identified as NSO are open to fluid mineral leasing, but surface occupancy or surface-disturbing activities associated with fluid mineral leasing cannot be conducted on the surface of the land. Access to fluid mineral deposits would require horizontal drilling from outside the boundaries of the NSO area.

Noxious weeds. A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the US.

Objective. A description of a desired outcome for a resource. Objectives can be quantified and measured and, where possible, have established timeframes for achievement. (BLM)

Objective. A concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets. (Forest Service)

Off-highway vehicle (OHV) (off-road vehicle). Any motorized vehicle capable of, or designated for travel on or immediately over land, water or other natural terrain, excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense emergencies (43 CFR 8340.0-5).

Open. Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR 8340.0-5 defines the specific meaning of "open" as it relates to OHV use.

Opportunity areas/habitat. Those portions of a Sage-Grouse Management Areas that currently do not contribute to the life cycle of GRSG but are areas where restoration or rehabilitation efforts can provide additional habitat when linked to existing GRSG populations. This definition is applicable to Alternative E1 (based on the State of Utah's *Conservation Plan for Greater Sage-grouse in Utah*) and the Proposed Plans.

Ozone. A faint blue gas produced in the atmosphere from chemical reactions of burning coal, gasoline, and other fuels and chemicals found in products such as solvents, paints, and hairsprays.

Paleontological resources. The physical remains or other physical evidence of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are important for correlating and dating rock strata and for understanding past environments, environmental change, and the evolution of life.

Particulate matter (PM). One of the six "criteria" pollutants for which the US Environmental Protection Agency established National Ambient Air Quality Standards. Particulate matter is defined as two categories, fine particulates, with an aerodynamic diameter of 10 micrometers (PM_{10}) or less, and fine particulates with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$).

Perennial stream. A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

Permitted use. The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and expressed in AUMs (43 CFR 4100.0-5) (from H-4180-1, BLM Rangeland Health Standards Manual).

Permittee. A person or company permitted to graze livestock on public land.

Physiography. The study and classification of the surface features of the earth.

Plan of Operations. A Plan of Operations is required for all mining activity exploration greater than 5 acres or surface disturbance greater than casual use on certain special category lands. Special category lands are described under 43 CFR 3809.11(c) and include such lands as

designated Areas of Critical Environmental Concern, lands within the National Wilderness Preservation System, and areas closed to off-road vehicles, among others. In addition, a plan of operations is required for activity greater than casual use on lands patented under the Stock Raising Homestead Act with Federal minerals where the operator does not have the written consent of the surface owner (43 CFR 3814). The Plan of operations needs to be filed in the BLM field office with jurisdiction over the land involved. The Plan of Operations does not need to be on a particular form but must address the information required by 43 CFR 3809.401(b).

Planning area. The geographical area for which LUPs are developed and maintained. The Utah Sub-Region planning area includes all lands in the State of Utah, minus Washington, San Juan, Davis, and Salt Lake counties. These counties were not included in the planning area because they do not include GRSG habitat. In addition to lands in Utah, the Utah Sub-Region planning area also includes portions of the Ashley National Forest that extend into the State of Wyoming.

Planning criteria. The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision making, analysis, and data collection during planning. Planning criteria streamlines and simplifies the resource management planning actions.

Planning issues. Concerns, conflicts, and problems with the existing management of public lands. Frequently, issues are based on how land uses affect resources. Some issues are concerned with how land uses can affect other land uses, or how the protection of resources affects land uses.

Policy. This is a statement of guiding principles, or procedures, designed and intended to influence planning decisions, operating actions, or other affairs of the BLM or Forest Service. Policies are established interpretations of legislation, executive orders, regulations, or other presidential, secretarial, or management directives.

Population area. Within the planning area, there are numerous areas with GRSG habitat. These areas are non-contiguous, meaning they are often separated by natural geographic features/barriers or human development. Because of the disconnected nature of the habitat, for the purposes of this planning process, the BLM and Forest Service have placed all occupied GRSG habitat into one of 15 GRSG population areas (13 located in Utah, 2 located in Wyoming). The population area boundaries were drawn to include all occupied GRSG habitat in the State of Utah plus areas within 5 miles of all occupied leks. The boundaries are also large enough to include areas that are not considered GRSG habitat but have been identified as lands that could provide important connectivity or facilitate the movement of GRSG between habitats. Although the boundaries of population areas were drawn using some biological considerations it is important to note that they are not intended to reflect distinct populations.

Preliminary Priority Management Area (PPMA). BLM-administered and National Forest System lands identified to be managed as having the highest conservation value to maintaining sustainable GRSG populations. The PPMAs are derived from and generally follow the preliminary priority habitat boundaries but may be modified in extent based on the objectives of each alternative. Likewise, management strategies applied to the PPMAs may vary by alternative.

Preliminary General Management Area (PGMA). BLM-administered and National Forest System lands identified requiring special management to sustain GRSG populations, but that are not as important as PPMAs. The PGMAs are derived from and generally follow the preliminary general habitat boundaries but may be modified in extent based on the objectives of each alternative. Likewise, management strategies applied to the PGMAs may vary by alternative.

Prescribed fire. Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist and NEPA requirements, where applicable, must be met before ignition.

Primitive road. A linear route managed for use by four-wheel drive or high-clearance vehicles. These routes do not customarily meet any BLM road design standards. Unless specifically prohibited, primitive roads can also include other uses, such as hiking, biking, and horseback riding (BLM Manual 1626, Travel and Transportation Manual).

Primitive route. Any transportation linear feature located within areas that have been identified as having wilderness characteristics and not meeting the wilderness inventory road definition (BLM Manual 6310, Conducting Wilderness Characteristics Inventory on BLM Lands).

Priority Greater Sage-Grouse habitat. Areas that have been identified as having the highest conservation value to maintaining sustainable GRSG populations. These areas would include breeding, late brood-rearing, and winter concentration areas.

Proper functioning condition. A term describing stream health that is based on the presence of adequate vegetation, landform and debris to dissipate energy, reduce erosion and improve water quality.

Public domain. The term applied to any or all of those areas of land ceded to the Federal Government by the Original States and to such other lands as were later acquired by treaty, purchase or cession, and are disposed of only under the authority of Congress.

Public land. Land or interest in land owned by the US and administered by the Secretary of the Interior through the BLM without regard to how the US acquired ownership, except lands located on the Outer Continental Shelf and land held for the benefit of Indians, Aleuts, and Eskimos (H-1601-1, BLM Land Use Planning Handbook).

Range Improvement. The term range improvement means any activity, structure or program on or relating to rangelands which is designed to improve production of forage; change vegetative composition; control patterns of use; provide water; stabilize soil and water conditions; and provide habitat for livestock and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical means to accomplish the desired results.

Range improvement project. An authorized physical modification or treatment which is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and

wildlife. This definition includes, but is not limited to: structures, treatment projects and use of mechanical devices, or modifications achieved through mechanical means.

Raptor. Bird of prey with sharp talons and strongly curved beaks, such as hawks, owls, falcons, and eagles.

Reasonable foreseeable development scenario. The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

Reclamation. The suite of actions taken within an area affected by human disturbance, the outcome of which is intended to change the condition of the disturbed area to meet pre-determined objectives and/or make it acceptable for certain defined resources (e.g., wildlife habitat, grazing, ecosystem function, etc.).

Recreation management area. Includes special recreation management areas (SRMAs) and extensive recreation management areas (ERMAs); see SRMA and ERMA definitions.

Recreation experiences. Psychological outcomes realized either by recreation-tourism participants as a direct result of their on-site leisure engagements and recreation-tourism activity participation or by nonparticipating community residents as a result of their interaction with visitors and guests within their community or interaction with the BLM, Forest Service, and other public and private recreation-tourism providers and their actions.

Recreation opportunities. Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.

Recreation settings. The collective distinguishing attributes of landscapes that influence and sometimes actually determine what kinds of recreation opportunities are produced.

Reference State. The reference state is the state where the functional capacities represented by soil/site stability, hydrologic function, and biotic integrity are performing at an optimum level under the natural disturbance regime. This state usually includes, but is not limited to, what is often referred to as the potential natural plant community.

Rehabilitate. Returning disturbed lands as near to its predisturbed condition as is reasonably practical or as specified in approved permits.

Renewable energy. Energy resources that constantly renew themselves or that are regarded as practically inexhaustible. These include solar, wind, geothermal, hydro, and biomass. Although particular geothermal formations can be depleted, the natural heat in the Earth is a virtually inexhaustible reserve of potential energy.

Required design features (RDFs). RDFs are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully

assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat.
- A specific RDF will provide no additional protection to GRSG or its habitat.

Reserve common allotment. An area which is designated in the land use plan as available for livestock grazing but reserved as an area available for use as an alternative to grazing in another allotment in order to facilitate rangeland restoration treatments and recovery from natural disturbances such as drought or wildfire. The reserve common allotment would provide needed flexibility that would help the agency apply temporary rest from grazing where vegetation treatments and/or management would be most effective.

Resource management plan (RMP). A BLM land use plan as prescribed by the Federal Land Policy and Management Act that establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, objectives, and actions to be achieved.

Restore/restoration. Implementation of a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long term. The long-term goal is to create functional, high quality habitat that is occupied by sage-grouse. Short-term goal may be to restore the landform, soils and hydrology and increase the percentage of preferred vegetation, seeding of desired species, or treatment of undesired species.

Restriction/restricted use. A limitation or constraint on public land uses and operations. Restrictions can be of any kind, but most commonly apply to certain types of vehicle use, temporal and/or spatial constraints, or certain authorizations.

Revegetate/revegetation. The process of putting vegetation back in an area where vegetation previously existed, which may or may not simulate natural conditions.

Revision. The process of completely rewriting the land use plan due to changes in the planning area affecting major portions of the plan or the entire plan.

Right-of-way (ROW). Public lands authorized to be used or occupied for specific purposes pursuant to a right-of-way grant, which are in the public interest and which require ROWs over, on, under, or through such lands.

Right-of-way avoidance area. An area identified through resource management planning to be avoided but may be available for ROW location with special stipulations.

Right-of-way exclusion area. An area identified through resource management planning that is not available for ROW location under any conditions.

Riparian area. A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

Riparian zone. An area one-quarter mile wide encompassing riparian and adjacent vegetation.

Road. A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use. (BLM)

Road or trail. A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (Forest Service)

Rotation. Grazing rotation between pastures in the allotment for the permitted time.

Routes. Multiple roads, trails and primitive roads; a group or set of roads, trails, and primitive roads that represents less than 100 percent of the transportation system. Generically, components of the transportation system are described as "routes."

Sagebrush focal areas (SFA). Areas identified by the USFWS that represent recognized "strongholds" for GRSG that have been noted and referenced by the conservation community as having the highest densities of GRSG and other criteria important for the persistence of GRSG.

Sale (public land). A method of land disposal pursuant to Section 203 of FLPMA, whereby the US receives a fair-market payment for the transfer of land from federal ownership. Public lands determined suitable for sale are offered on the initiative of the BLM. Lands suitable for sale must be identified in the RMP. Any lands to be disposed of by sale that are not identified in the current RMP, or that meet the disposal criteria identified in the RMP, require a plan amendment before a sale can occur.

Saturated soils. Occur when the infiltration capacity of the soil is exceeded from above due to rainfall or snowmelt runoff. Soils can also become saturated from groundwater inputs.

Scenic byways. Highway routes that have roadsides or corridors of special aesthetic, cultural, or historical value. An essential part of the highway is its scenic corridor. The corridor may contain outstanding scenic vistas, unusual geologic features, or other natural elements.

Scoping process. An early and open public participation process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

Season of use. The time during which livestock grazing is permitted on a given range area, as specified in the grazing lease.

Seeding. Seeding is a vegetation treatment that includes the application of grass, forb, or shrub seed, either aerially or from the ground. In areas of gentle terrain, ground applications of seed are often accomplished with a rangeland drill. Seeding allows the establishment of native species or placeholder species and restoration of disturbed areas to a perennial-dominated cover type, thereby decreasing the risk of subsequent invasion by exotic plant species. Seeding would be used primarily as a follow-up treatment in areas where disturbance or the previously described treatments have removed exotic plant species and their residue.

Short-term effect. The effect occurs only during or immediately after implementation of the alternative.

Special recreation management area (SRMA). An administrative public lands unit identified in land use plans where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.

Special recreation permit (SRP). Authorization that allows for recreational uses of public lands and related waters. Issued as a means to control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors. Commercial SRPs are also issued as a mechanism to provide a fair return for the commercial use of public lands.

Special status species. BLM special status species are: (1) species listed, candidate, or proposed for listing under the Endangered Species Act; and (2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the Endangered Species Act that are designated as BLM sensitive by the BLM State Director(s). All federally listed candidate species, proposed species, and delisted species in the five years following delisting are conserved as BLM sensitive species.

Split estate. This is the circumstance where the surface of a particular parcel of land is owned by a different party than the minerals underlying the surface. Split estates may have any combination of surface/subsurface owners: federal/state; federal/private; state/private; or percentage ownerships. When referring to the split estate ownership on a particular parcel of land, it is generally necessary to describe the surface/subsurface ownership pattern of the parcel.

Stabilize. The process of stopping further damage from occurring.

Standard. A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (e.g., land health standards). To be expressed as a desired outcome (goal). (BLM)

Standard. A mandatory constraint on project and activity decisionmaking, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. (Forest Service)

Standard lease terms and conditions. Areas may be open to mineral leasing with no specific management decisions defined in a Resource Management Plan; however, these areas are subject to lease terms and conditions as defined on the lease form (Form 3100-11, Offer to Lease and Lease for Oil and Gas; and Form 3200-24, Offer to Lease and Lease for Geothermal Resources).

State. A state is comprised of an integrated soil and vegetation unit having one or more biological communities that occur on a particular ecological site and that are functionally similar with respect to the three attributes (soil/site stability, hydrologic function, and biotic integrity) under natural disturbance regimes.

Stipulation (general). A term or condition in an agreement or contract.

Stipulation (oil and gas). A provision that modifies standard oil and gas lease terms and conditions in order to protect other resource values or land uses and is attached to and made a part of individual lease requirements at the time the lease is issued. Once a mineral lease is issued, the applied stipulations cannot generally be changed or altered. Exceptions, modifications, or waivers may be granted under certain conditions outlined in the LUP. Typical lease stipulations include No Surface Occupancy (NSO), Timing Limitations (TL), and Controlled Surface Use (CSU). Lease stipulations are developed through the land use planning (RMP) process.

Surface disturbance. Suitable habitat is considered disturbed when it is removed and unavailable for immediate sage-grouse use.

a. Long-term removal occurs when habitat is physically removed through activities that replace suitable habitat with long term occupancy of unsuitable habitat such as a road, power line, well pad or active mine. Long-term removal may also result from any activities that cause soil mixing, soil removal, and exposure of the soil to erosive processes.
b. Short–term removal occurs when vegetation is removed in small areas, but restored to suitable habitat within 5 years of disturbance, such as a successfully reclaimed pipeline, or successfully reclaimed drill hole or pit.
c. Suitable habitat rendered unusable due to numerous anthropogenic disturbances
d. Anthropogenic surface disturbance are surface disturbances meeting the above definitions which result from human activities.

Surface-disturbing activities. An action that alters the vegetation, surface/near surface soil resources, and/or surface geologic features, beyond natural site conditions and on a scale that affects other public land values. Examples of surface disturbing activities may include: operation of heavy equipment to construct well pads, roads, pits and reservoirs; installation of pipelines

and power lines; and the conduct of several types of vegetation treatments (e.g., prescribed fire, etc.). Surface disturbing activities may be either authorized or prohibited.

Surface use(s). These are all the various activities that may be present on the surface or near-surface (e.g., pipelines), of the public lands. It does not refer to those subterranean activities (e.g., underground mining, etc.) occurring on the public lands or federal mineral estate. When administered as a use restriction (e.g., *No Surface Use*), this phrase prohibits all but specified resource uses and activities in a certain area to protect particular sensitive resource values and property. This designation typically applies to small acreage sensitive resource sites (e.g., plant community study exclosure, etc.), and/or administrative sites (e.g., government ware-yard, etc.) where only authorized, agency personnel are admitted.

Sustained yield. The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple uses.

Tall structure. As used in this document, a tall structure is any man-made structure that has the potential to disrupt lekking or nesting birds by creating new perching/nesting opportunities and/or decrease the use of an area. A determination as to whether something is considered a tall structure would be made based on local conditions such as vegetation or topography.

Technical/economically feasible. Actions that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. It is the BLM's and Forest Service's sole responsibility to determine what actions are technically and economically feasible. The BLM and the Forest Service will consider whether implementation of the proposed action is likely given past and current practice and technology; this consideration does not necessarily require a cost-benefit analysis or speculation about an applicant's costs and profit. (Modified from the CEQ's 40 Most Asked Questions and BLM NEPA Handbook, Section 6.6.3)

Temporary/temporary use. A relative term that must be considered in the context of the resource values affected and the nature of the resource use(s)/activity(ies) taking place. Generally, a temporary activity is considered to be one that is not fixed in place and is of short duration. (BLM)

Temporary special use permit. A type of permit that terminates within 1 year or less after the approval date. All other provisions applicable to permits apply fully to temporary permits. Temporary special use permits are issued for seasonal or short-duration uses involving minimal improvement and investment. (Forest Service)

Terrestrial. Living or growing in or on the land.

Threatened species. Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Management). Under the Endangered Species Act in the US, "threatened" is the lesser-protected of the two categories. Designation as threatened (or endangered) is determined by USFWS as directed by the Endangered Species Act.

Timber. Standing trees, downed trees, or logs which are capable of being measured in board feet.

Timing limitation (TL). The TL stipulation, a moderate constraint, is applicable to fluid mineral leasing, all activities associated with fluid mineral leasing (e.g., truck-mounted drilling and geophysical exploration equipment off designated routes, construction of wells and/or pads), and other surface-disturbing activities (i.e., those not related to fluid mineral leasing). Areas identified for TL are closed to fluid mineral exploration and development, surface-disturbing activities, and intensive human activity during identified time frames. This stipulation does not apply to operation and basic maintenance activities, including associated vehicle travel, unless otherwise specified. Construction, drilling, completions, and other operations considered to be intensive in nature are not allowed. Intensive maintenance, such as workovers on wells, is not permitted. TLs can overlap spatially with NSO and CSU, as well as with areas that have no other restrictions.

Total dissolved solids. Salt, or an aggregate of carbonates, bicarbonates, chlorides, sulfates, phosphates, and nitrates of calcium, magnesium, manganese, sodium, potassium, and other cations that form salts.

Total maximum daily load. An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Trail. A linear route managed for human-power (e.g., hiking or bicycling), stock (e.g., equestrian), or off-highway vehicle forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Transition. A shift between two states. Transitions are not reversible by simply altering the intensity or direction of factors that produced the change. Instead, they require new inputs such as revegetation or shrub removal. Practices, such as these, that accelerate succession are often expensive to apply.

Transmission. The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission line. An electrical utility line with a capacity greater than or equal to 100 kilovolts or a natural gas, hydrogen, or water pipeline greater than or equal to 24 inches in diameter.

Transportation system. The sum of the recognized inventory of linear features (roads, primitive roads, and trails) formally recognized, designated, and approved as part of the transportation system.

Travel management areas. Polygons or delineated areas where travel management (either motorized or nonmotorized) needs particular focus. These areas may be designated as open,

closed, or limited to motorized use and will typically have an identified or designated network of roads, trails, ways, and other routes that provide for public access and travel across the planning area. All designated travel routes within travel management areas should have a clearly identified need and purpose as well as clearly defined activity types, modes of travel, and seasons or times for allowable access or other limitations (BLM Manual 1626, Travel and Transportation Management). Refer to 43 CFR 8340.0-5 for definitions of open, closed, and limited areas. (BLM)

Travel management system. Planned and authorized roads, trails, and areas for motor vehicle use on National Forest System lands that are managed in a controlled, sustained manner. (Forest Service)

Trespass. Any unauthorized use of public land.

Tribal interests. Native American or Native Alaskan economic rights such as Indian trust assets, resource uses and access guaranteed by treaty rights, and subsistence uses.

Understory. That portion of a plant community growing underneath the taller plants on the site.

Unitization. A grouping of multiple adjacent mineral leases, in order to operate those leases as a single unit, under a single operator.

Utility corridor. Tract of land varying in width forming passageway through which various commodities such as oil, gas, and electricity are transported.

Valid existing rights. Documented, legal rights or interests in the land that allow a person or entity to use said land for a specific purpose and that are still in effect. Such rights include but are not limited to fee title ownership, mineral rights, rights-of-way, easements, permits, and licenses. Such rights may have been reserved, acquired, leased, granted, permitted, or otherwise authorized over time.

Vegetation manipulation. Planned alteration of vegetation communities through use of mechanical, chemical, seeding, and/or prescribed fire or managed fire to achieve desired resource objectives.

Vegetation treatments. Management practices which change the vegetation structure to a different stage of development. Vegetation treatment methods include managed fire, prescribed fire, chemical, mechanical, and seeding.

Vegetation type. A plant community with immediately distinguishable characteristics based upon and named after the apparent dominant plant species.

Visibility (air quality). A measure of the ability to see and identify objects at different distances.

Visitor day. Twelve visitor hours that may be aggregated by one or more persons in single or multiple visits.

Visual resources. The visible physical features on a landscape, (topography, water, vegetation, animals, structures, and other features) that comprise die scenery of the area.

Watershed. Topographical region or area delineated by water draining to a particular watercourse or body of water.

West Nile virus. A virus that is found in temperate and tropical regions of the world and most commonly transmitted by mosquitos. West Nile virus can cause flu-like symptoms in humans and can be lethal to birds, including sage-grouse.

Western Association of Fish and Wildlife Agencies (WAFWA) Management Zones (MZs). Seven GRSG management zones established based on populations across the entire range of the GRSG. GRSG habitat in the Utah Sub-region overlaps four WAFWA Management Zones including: MZ II – Wyoming Basins, MZ III – Southern Great Basin, MZ IV – Snake River Plain, and MZ VII – Colorado Plateau. WAFWA management zones are used in the cumulative effects analysis.

Wildcat well. An exploratory oil well drilled in land not known to be an oil field.

Wilderness. A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value. The definition is contained in Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).

Wilderness characteristics. Wilderness characteristics attributes include the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation. They may also include supplemental values. Lands with wilderness characteristics are those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in section 2(c) of the Wilderness Act.

Wilderness Study Area (WSA). An area inventoried, found to have wilderness characteristics, and managed to preserve those characteristics under authority of public lands required by section 603 of Federal Land Policy and Management Act (FLMPA) of 1976 or the land use planning direction found in section 202 of FLMPA.

Wildfire. Unplanned ignition or prescribed fire that is declared a wildfire. Wildfires may be managed to meet one or more objectives as specified in the RMP and these objectives can change as the fire spreads across the landscape. (BLM)

Wildfire suppression. An appropriate management response to wildfire, escaped wildland fire use or prescribed fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. (National Wildfire Coordinating Group)

Wildland fire. An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out. (National Wildfire Coordinating Group, October 2014, http://www.nwcg.gov/pms/pubs/glossary/w.htm; Forest Service)

Wildland fire use. *See "wildfire" definition.*

Wildland-urban interface (WUI). The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Withdrawal. An action that restricts the use of public land and segregates the land from the operation of some or all of the public land and mineral laws. Withdrawals are also used to transfer jurisdiction of management of public lands to other federal agencies.

Winter concentration areas. Sage-grouse winter habitats which are occupied annually by sage-grouse and provide sufficient sagebrush cover and food to support birds throughout the entire winter (especially periods with above average snow cover). Many of these areas support several different breeding populations of sage-grouse. Sage-grouse typically show high fidelity for these areas, and loss or fragmentation can result in significant population impacts.

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