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

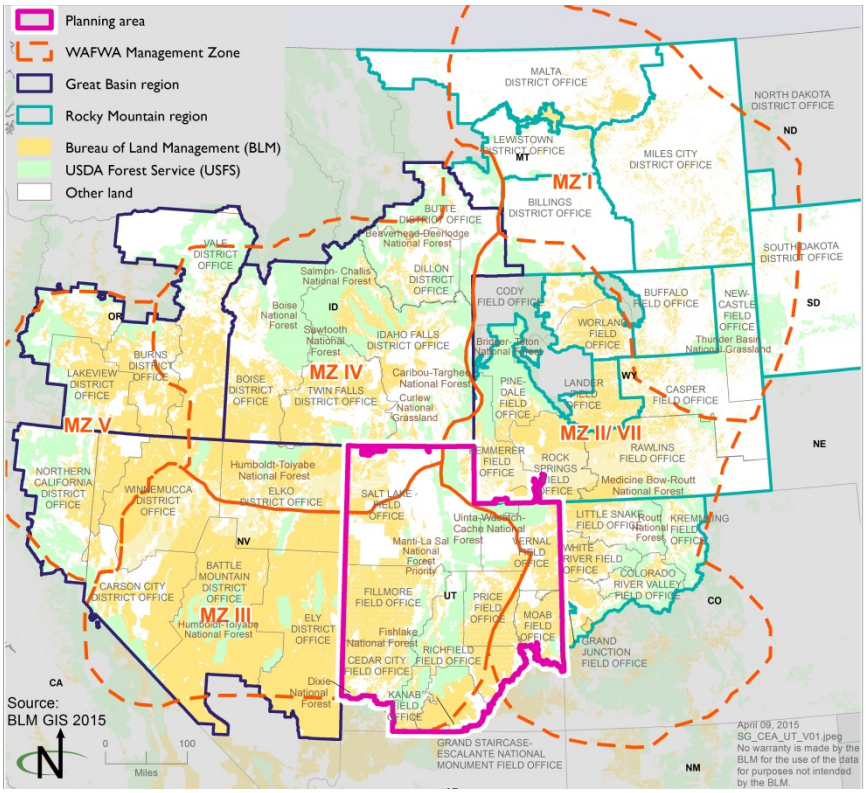
	PHMA in Sub-Region (Acres)	PHMA in MZ (Acres)	GHMA in Sub-Region (Acres)	GHMA in MZ (Acres)
MZ III	2,989,000	9,280,000	965,500	4,774,200
MZ IV	1,138,000	~22,000,000	0	~10,000,000
MZ II/VII	1,425,500	~14,000,000	831,400	~17,000,000

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=13011000000000&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 anticipate d 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.	Implementation 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.