Lewistown Field Office Greater Sage-Grouse

Proposed Resource Management Plan Amendment and Final Environmental Impact Statement

Volume II: Chapters 5-7, Glossary, Index, and Appendices

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BLM

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACEC	Area of Critical Environmental Concern
AMP	allotment management plan
APD	application for permit to drill
AQI	air quality index
AUM	animal unit month
BER	Baseline Environmental Report
BLM	Bureau of Land Management
BMP	best management practice
BSU	Biologically Significant Unit
CEA	cumulative effects analysis
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	centimeter
CO	carbon monoxide
COA	conditions of approval
COT	Conservation Objectives Team
CSGD	Cooperative State Grazing District
CSU	controlled surface use
CTTM	comprehensive travel and transportation management
DDCT	density and disturbance calculation tool
DOI	Department of the Interior
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act of 1973
ES&R	emergency stabilization and rehabilitation
ESD	ecological site descriptions
FACA	Federal Advisory Committee Act
FLPMA	Federal Land Policy and Management Act of 1976
FMU	Fire Management Unit
Forest Service	United States Department of Agriculture, Forest Service
FRCC	fire regime condition class
ft	foot
GHMA	general habitat management area
GHG	greenhouse gas
GIS	geographic information system
GRSG	Greater Sage-Grouse
HAF	Habitat Assessment Framework
IM	Instruction Memorandum

IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
km	kilometer
kV	kilovolt
LFO	Lewistown Field Office
m	meter
MCF	thousand cubic feet
MFWP	Montana Fish, Wildlife, and Parks
MOU	memorandum of understanding
MSGOT	Montana Sage Grouse Oversight Team
MTDEQ	Montana Department of Environmental Quality
MTNHP	Montana Natural Heritage Program
MZ	Management Zone
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969, as amended
NO_2	nitrogen dioxide
NOC	National Operations Center
NRCS	National Resource Conservation Service
NSHT	National Scenic/Historic Trails
NSO	no surface occupancy
NTT	National Technical Team
OHV	off-highway vehicle
PAC	Priority Area for Conservation
PCPI	per capita personal income
PFC	proper functioning condition
PGH	preliminary general habitat
PHMA	priority habitat management area
$PM_{2.5}$	particulate matter with a diameter less than or equal to 2.5 microns
PM_{10}	particulate matter with a diameter less than or equal to 10 microns
PPH	preliminary priority habitat
RDF	required design feature
ReGAP	Regional Gap Analysis Program
RMP	resource management plan
RMPA	resource plan amendment
ROD	record of decision
ROW	right-of-way
SAIPE	Small Area Income and Poverty Estimates
SFA	sagebrush focal area
SGI	NRCS Sage-Grouse Initiative
SO_2	sulfur dioxide
SRMA	Special Recreation Management Area
SRP	special recreation permit

TL	timing limitation
TPI	total personal income
US	United States
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAFWA	Western Association of Fish and Wildlife Agencies
WAPA	Western Area Power Administration
WSA	Wilderness Study Area

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Chapter 5
Cumulative Impacts

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CHAPTER 5
CUMULATIVE IMPACTS

5.1 CHANGES BETWEEN DRAFT AND FINAL EIS

- Cumulative effects analysis in **Section 5.3,** Greater Sage-Grouse, was revised to include a cumulative effects analysis on GRSG at the WAFWA Management Zone level. 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 Management Zone. The Draft RMPA/EIS, in **Chapter 5**, included a qualitative analysis and identified that a quantitative analysis would be completed for the Proposed RMPA/Final EIS at the WAFWA Management Zone.
- The likely direct and indirect impacts on the human and natural environment that could occur from implementing the Proposed Plan Amendment presented in **Chapter 2** were incorporated into **Chapter 5**.

5.2 INTRODUCTION

This chapter presents the likely cumulative impacts on the human and natural environment that could occur from implementing the alternatives presented in **Chapter 2**. This chapter is organized by topic, similar to **Chapter 3** and **Chapter 4**.

Cumulative impacts are effects on the environment that result from the impact of implementing any one of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS alternatives in combination with other actions outside the scope of this plan, 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 non-public 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.

5.2.1 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. Cumulative impact analysis is limited to important issues of national, regional, or local significance.

Because of the programmatic nature of the RMPA and cumulative assessment, the analysis tends to be broad and generalized to address potential impacts 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 a 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 impacts or synergistic interaction among or between impacts.
- Potential for impacts across political and administrative boundaries.
- Other spatial and temporal characteristics of each affected resource.
- Comparative scale of cumulative impacts across alternatives.

The geographic scope for the cumulative impact analysis extends to the planning area boundary. For **Section 5.3**, Greater Sage-Grouse, the cumulative impact analysis includes an analysis at the WAFWA MZ I (Great Plains) and MZ IV (Snake River Plains) levels, in addition to the planning area analysis. WAFWA management zones are biologically based delineations that were determined by GRSG populations and sub-populations identified within seven floristic

provinces. Analysis at this level enables the decision maker to understand the impacts on GRSG at a biologically meaningful scale.

5.2.2 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 on the basis of 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 through meetings held with cooperators and BLM employees with local knowledge of the area. Each was asked to provide information on the most influential past, present, or reasonably foreseeable future actions. Additional information was obtained through discussions with agency officials and review of publicly available materials and websites.

Effects of past actions and activities are manifested in the current condition of the resources, as described in the affected environment (see **Chapter 3**) and in **Table 5-1**. Reasonably foreseeable future actions are actions that have been committed to or known proposals that would take place within a 10-year planning period. **Table 5-1** provides a list of future actions considered in the cumulative effects analysis.

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 plan or because so little is known about the potential action that formulating an analysis of impacts is premature and/or speculative. 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 BLM 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.

Table 5-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Comprise the Cumulative Impact Scenario

National Greater Sage-Grouse planning strategy	The BLM and Forest Service are preparing several EISs with associated plan amendments to address a range of alternatives focused on specific conservation measures across the range of the GRSG. Several on-going RMP revisions will also be addressing specific conservation measures. The amendments will be coordinated under two administrative planning regions across the entire range of the GRSG; Rocky Mountain Region and the Great Basin Region. The Rocky Mountain Region consists of land use plans in North Dakota, South Dakota, Wyoming, and Colorado and in portions of Montana and Utah. The Great Basin Region consists of land use plans in California, Nevada, Oregon, and Idaho and in portions of Utah and Montana.
Other land use plans	The Judith Resource Area Resource Management Plan (BLM 1994) and Headwaters Resource Management Plan (BLM 1984) set management, protection, and use goals and guidelines for the Lewistown and Butte Field Offices and are currently being revised in a new RMP planning effort. The expected decision date for the revised LFO Resource Management Plan is 2017. The Billings, Miles City, and South Dakota Field Offices and Hi-Line District Office are also currently revising their RMPs. Those three plans are expected to be completed in 2015.
Greater Sage-Grouse Habitat Conservation Strategy	The Governor of the State of Montana issued Executive Order 10-2014 which created the MSGOT and the Montana Sage Grouse Habitat Conservation Program. The executive order outlines a number of conservation strategies for state agencies to follow for land uses and activities in GRSG habitat in addition to establishing the MSGOT and habitat conservation program. The State conservation efforts are complementary to the conservation measures proposed in the BLM land use plans and when combined would provide conservation efforts across land ownership boundaries.
Energy and minerals development	Oil and Gas Leasing. The BLM routinely offers land parcels for competitive oil and gas leasing to allow exploration and development of oil and gas resources for public sale. Continued leasing is necessary for oil and gas companies to seek new areas for oil and gas production, or to develop previously inaccessible/uneconomical reserves. Since 1988, the LFO has been deferring nominated oil and gas lease parcels that require a special lease stipulation to protect important wildlife values. These deferrals are based on a protest resolution decision associated with existing RMPs in place for the field office. There are currently 55,880 acres of existing BLM surface/federal minerals and 33,881 acres of private state, or other surface/federal mineral leases within the RMPA planning area.
Vegetation Management	17, 437 acres of vegetation treatments were recorded in the LFO from 2002-2012. Treatments include prescribed fire, weed control and mechanical treatments such as thinning, mastication, twist-spiking, and restoration of non-native fields.
	Hazardous fuels reduction. Fuels treatments, including prescribed fires, chemical and mechanical treatment, and seeding, would likely continue and potentially increase in the future. Approximately 1,000 acres of crested wheatgrass restoration, clubmoss and mechanical treatments have been proposed. Approximately 129,000 acres of prescribed fire and maintenance burning have been proposed and could potentially be implemented within the life of this plan.

Table 5-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Comprise the Cumulative Impact Scenario

	Conifer removal. Approximately 1,000 acres of conifer removal was approved in PH within the Yellowstone Watershed GRSG population approximately 30 miles north of Winnett in 2014, with additional acres planned annually. The North Fork project proposes to remove approximately 300 acres of conifers, mostly Douglas-fir in GH within the Belt Mountains GRSG population.
Livestock grazing	Livestock grazing has a long history in the region. Generally, livestock use has decreased over the past 100 years. Grazing in portions of the RMPA planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable between 2002 and 2012. Grazing on private lands within the RMPA planning area is expected to remain stable or slightly decrease as residential and recreational development increases. Drought and water availability in the planning has a significant impact on livestock grazing. Infrastructure constructed on BLM-administered lands to support livestock grazing within the 5-county planning area from 2002-2012 is as follows: • 26 miles of stockwater pipeline • 42 watering sites which may include reservoirs, reservoir reconstructions, pits, or stocktanks • eight cattleguards • 58 fences which may include 3-wire, 4-wire, woven or electric fence totaling 97.4 miles. The following range improvement projects have been proposed within the planning area: • 21 fences totaling 65 miles; three miles are proposed for removal • 84 miles of stockwater pipeline (estimated) • 87 stockwatering sites
Recreation and visitor use	The primary recreational activities in the LFO are hunting, fishing, hiking, horseback riding, sight-seeing, and target shooting. Recreation-based visitor use in the LFO is expected to maintain or increase on BLM- and non-BLM-administered lands. <u>Unauthorized travel</u>. Travel off of designated or existing routes as well as the creation of social trails has occurred and would likely continue to occur within the decision area.
Lands and realty	Applications for ROW authorizations may increase to accommodate development, such as residential development and communication site usage for public safety and homeland security. In the project planning area (5 counties), the number of ROW actions (based on authorizations) has steadily increased since 2006 (7) to a high of 13 in 2008. The average between 2008 and 2012 was approximately 10 actions per year. The FY2013 actions included: • Three temporary use (film) permits for 5,600 acres of temporary occupancy; • Two power line ROWs (1 overhead and 1 buried) for 28.7 acres; • Three road ROWs for 5 acres of disturbance; and

Table 5-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Comprise the Cumulative Impact Scenario

	• Two overhead telecommunication ROWs for 2 acres of disturbance. Total 2013 surface disturbance was approximately 5,635.6 acres (5,600.3 of which is temporary surface occupancy). There is one pending land exchange in Petroleum County for 240 acres. **All data for this ROW section is for the project planning area only – (five counties) and does not include all eight counties covered by the LFO.** *Some ROWs will encumber land in more than one county. When more than one county is involved in a ROW, it may physically cover more than one county, or a township/range may be split among two counties and the computer system will note all counties rather than one or the other. In order to accurately record acres, acreage is reported total for the ROW, not for all counties involved.* *ROWs have specific size or geographic locations. For instance, a ROW may cover a two-track road which physically covers approximately 15 feet wide by a certain length. However, the ROW may authorize a width of 20 feet in width in order for maintenance to be completed. Therefore, the ROW acreage calculation will be based on the 20 feet rather than the 15 feet, which will appear to be a higher number of acres disturbed than what is actually disturbed on the ground. This is truer with utility services. While a power line may only physically occupy a 5-foot strip, but have a 30-foot wide ROW. Using this example, a five 5-foot ROW for five miles would actually only have approximately 3.03 acres of acres disturbed, yet the authorization document (and calculations above) would reflect the 30-foot wide strip or 18.18 acres.*
Spread of noxious/invasive weeds	Noxious weeds have invaded and would continue to invade many locations in the planning area. Noxious weeds are carried by wind, humans, machinery, and animals. The LFO currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, manual, and educational methods, primarily through the implementation of Weed Control Cooperative Range Improvement Agreements. The 1991 and 2007 RODs for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991), and the 2007 Programmatic Environmental Report (BLM 2007a), guide the management of noxious weeds in western states.
Wildland fires	From 2002-2012, there have been 324 wildfires documented on all lands within the LFO. 40,782 acres of human caused fires and 91, 702 acres of naturally occurring wildfires were reported during this time.
	Wildfires have been widely distributed in terms of frequency and severity. Increasing recurrence and severity of drought conditions have been predicted for this area as a result of climate change. This could, in turn, increase the occurrence and severity of wildfires on BLM-administered land.
Spread of forest insects and diseases	Several years of drought in western states have resulted in severe stress on forests. This stress has made trees less able to fend off attacks by insects such as mountain pine beetles. In recent years, forest diseases and infestations have been widespread throughout Montana.
Drought	For much of the last decade, most of the western US has experienced drought. Crop production, rangeland, riparian and forest health are all impacted by drought.
Climate change	Increased concern over GHG emissions and global warming issues may lead to future federal and state regulations limiting the emission of associated pollutants.

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 Judith Resource Area Resource Management Plan and Headwaters Resource Management Plan.

Projects and activities identified as having the greatest likelihood to generate potential cumulative impacts when added to the Lewistown Field Office Greater Sage-Grouse RMPA/EIS alternatives are displayed in **Table 5-1**.

5.3 GREATER SAGE-GROUSE

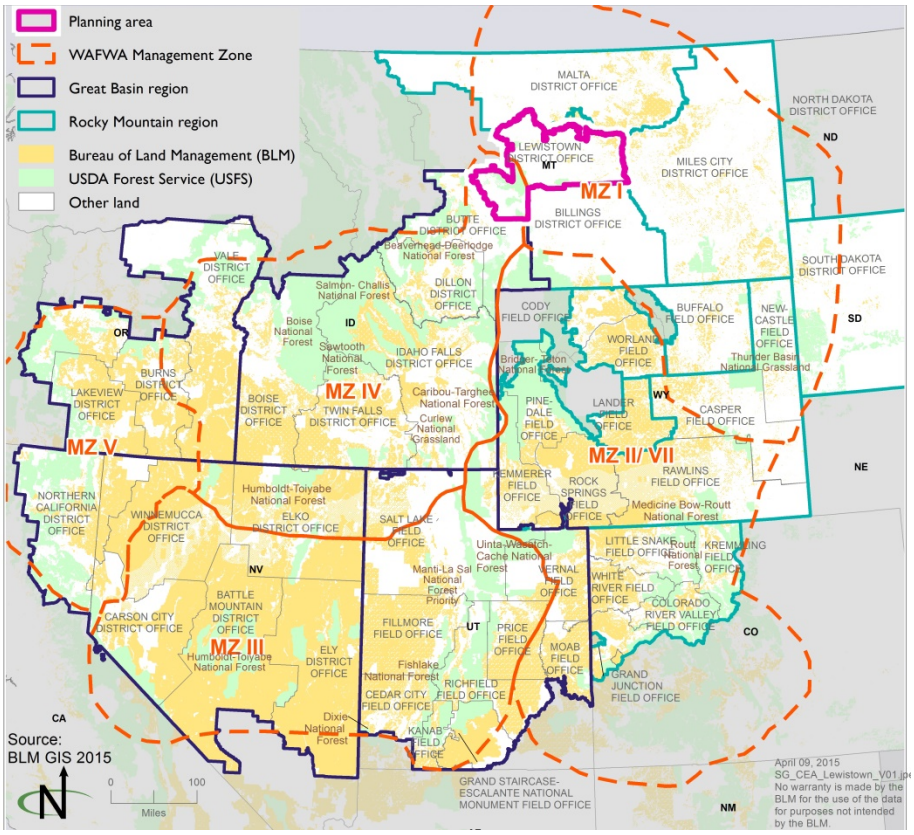
This cumulative effects analysis (CEA) discloses the long-term effects on GRSG from implementation of each of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS alternative in conjunction with other past, present, and reasonably foreseeable future actions. In accordance with CEQ guidance, cumulative effects need to be analyzed in terms of the specific resource and ecosystem being affected (Council on Environmental Quality 1997). As discussed in **Chapter 1**, 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 management zones based on populations within floristic provinces (Stiver et al. 2006). Therefore, the cumulative effects analysis study area extends beyond the LFO planning area boundary and consists of WAFWA MZ I.

The analysis of BLM actions in MZ I is primarily based on MZ-wide datasets developed by the BLM National Operations Center (NOC). Where quantitative data are not available, analysis is qualitative. This analysis includes past, present and reasonably foreseeable future actions are for all land ownerships in the MZ, and evaluates the impacts of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS, by alternative, when added to those. The analysis of nonfederal lands and actions includes the following:

- State plans
- Coordination with states and agencies during consistency reviews
- Additional data from non-BLM-administered lands

The following diagram shows the boundaries of the WAFWA Management Zones and the BLM and National Forest System planning areas. The LFO planning area has a small influence in the context of MZ I because it contains a small fraction of the PHMA (1,208,000 acres out of 12,506,500 total acres in MZ I; and GHMA (711,200 acres out of 28,417,600 total acres in MZ I). Of these acres in the LFO planning area, the BLM administers just over 233,000 acres of

PHMA and 112,000 acres of GHMA in MZ I. Thus, actions in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS are likely to have a smaller cumulative impact on GRSG in MZ I, compared to larger planning areas.



In addition to MZ I, LFO contains 303.800 acres of GHMA in MZ IV (The Belt Mountains area). However, BLM administers only 400 of these acres and no leks are present on BLM-administered land, the closest approximately 2.5 miles away. The MZ IV acreage is not discussed in detail in this CEA.

Section 5.3.2, Assumptions, lists assumptions used in the analysis. **Section 5.1.3**, Existing Conditions in WAFWA Management Zone I and the LFO Planning Area, describes existing conditions in Management Zone I and in the LFO planning area. **Section 5.3.4**, Regional Efforts to Manage Threats to GRSG, discusses existing federal, state, tribal and private efforts to conserve GRSG in Management Zone I. **Section 5.3.5**, Relevant Cumulative Actions, describes relevant cumulative actions for GRSG from the reasonably foreseeable future actions in GRSG habitat across MZ I. **Section 5.3.6**, Threats to GRSG in Management Zone I, analyzes threats to GRSG in MZ I and discusses the potential cumulative effects resulting from each threat for each alternative. **Section 5.3.7**, Conclusions, analyzes the cumulative effects on GRSG as a result of implementing each alternative in combination with other past, present, and reasonably foreseeable future actions in MZ I.

5.3.1 Methods

The CEA 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 baseline environmental 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 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 2013) were reviewed to identify the primary threats facing GRSG in each WAFWA Management Zone. Table 2 of the COT report lists threats to GRSG that are present and widespread in each population in the Management Zone.
- For MZ I the list of threats that are directly or indirectly affected by BLM actions are energy development/mining, infrastructure, grazing, conversion to agriculture, fire, spread of weeds, and recreation (USFWS 2013). Two other threats listed in the COT report, sagebrush eradication and isolation/small population size, affect GRSG populations in MZ I.
- 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 Management Zone, 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 CEA in the context of these other threats.
- Each threat is analyzed, and a brief conclusion for each threat is provided.

  - The BLM NOC compiled MZ-wide datasets for quantifiable actions in all proposed BLM RMP/EISs in MZ I. These datasets provide a means by which to quantify cumulative effects of direct impacts of the threats identified in the COT report.
  - 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.
  - 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 MZ I. The tables in this cumulative analysis display the number of acres across the entire MZ and the percentage of those acres that are located within the LFO planning area. To calculate the total number of acres in the MZ, the number of acres in the other BLM and Forest Service proposed plans across MZ I are added to the number of acres in the applicable LFO RMPA alternative. For example, the total number of acres for Alternative A includes all of the other proposed plans in MZ I plus LFO RMPA Alternative A. Likewise, Alternative B acreage includes all of the other proposed plans in MZ I plus LFO RMPA Alternative B.

- A discussion is provided for each alternative in **Section 5.3.7**, Conclusions. 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 actions in MZ I.
- The list of relevant cumulative actions in **Section 5.3.5** was derived from each proposed BLM RMP in MZ I 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 No Action Alternative and Proposed Plan Amendment, are used in this analysis.
- This analysis uses the most recent information available. For purposes of this analysis, the BLM has determined that the Proposed Plans for the other ongoing GRSG planning efforts in MZ I are reasonably foreseeable future actions.

The analysis begins with a broad-scale description of current federal, state, local, and private actions influencing GRSG in MZ I. A discussion of the major threats to GRSG in MZ I follows and a brief conclusion is provided for each major threat. Finally, in the **Conclusions** section, the cumulative effects on GRSG as a result of implementing each alternative are weighed when added to other past, present, and reasonably foreseeable future actions within MZ I.

5.3.2 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**. In addition, the following assumptions have been made:

- The timeframe for this analysis is 20 years.
- The CEA area extends beyond the planning area and encompasses all of WAFWA MZ I; the quantitative impact analysis focuses on impacts across the 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 of the review's initiation, and is used to compare predictions of the effects of the proposed action or a reasonable range of alternatives.
- The CEA quantitatively analyzes impacts on GRSG and their habitat in the MZ. Impacts on habitat are likely to correspond to impacts on populations within the management zone (MZ I), since reductions or alterations in habitat could affect reproductive success through reductions in available forage or nest sites. Human activity could cause disturbance to the birds, preventing them from mating or successfully rearing offspring. Human activities also could increase opportunities for predation, disease, or other stressors (Connelly et al. 2004; USFWS 2010; Manier et al. 2013).

5.3.3 Existing Conditions in WAFWA Management Zone 1 and the LFO Planning Area

This section summarizes existing conditions and past and present actions for the LFO planning area (discussed in more detail in **Chapter 3**) and for MZ I as a whole. Reasonably foreseeable future actions are discussed in **Section 5.3.5**.

GRSG Habitat and Populations

The LFO planning area is part of the Yellowstone Watershed GRSG population. MZ I contains some of the highest-connected networks of GRSG leks in the range (Knick and Hanser 2011); however, it also contains less productive sagebrush, similar to areas where GRSG have been extirpated (Wisdom et al. 2011). Sagebrush cover is naturally limited due to the dominant presence of grassland ecosystems. In combination with agricultural pressure and energy production in the Powder River Basin and extensive infrastructure, including power lines, fences, and roads (USFWS 2010), this results in substantial habitat limitations for GRSG populations.

In MZ I, state and private lands account for approximately 35 million acres of GRSG habitat (approximately 75 percent of habitat), with BLM-administered and other federal land accounting for only 25 percent of surface estate (Manier et al. 2013, p. 118). **Table 5-2** provides a breakdown of landownership and acres of GRSG habitat in MZ I. As the table shows, approximately 26 percent of PHMA and 13 percent of GHMA is on BLM-administered lands. In the LFO RMPA/EIS planning area, there are approximately 2 million acres of GRSG habitat, including approximately 350,000 acres (18 percent) on BLM-administered lands. The remaining 1.65 million acres (82 percent) of GRSG habitat comprise private, local, state, and other federal and tribal lands.

Table 5-2
Management Jurisdiction in MZ I by Acres of Priority and General Habitats

	Total Surface Area (Acres)	Priority (Acres)	General (Acres)	Non-habitat (Acres)
MZ I	84,110,800 (100%)	11,636,400 (14%)	34,663,000 (41%)	37,811,400 (45%)
BLM	8,325,300 (10%)	2,994,300 (26%)	4,524,900 (13%)	806,100 (10%)
Forest Service	4,532,500 (5%)	292,400 (3%)	515,300 (1%)	3,724,800 (82%)
Tribal and other federal	5,458,500 (6%)	219,700 (2%)	2,427,700 (7%)	2,811,100 (51%)
Private	54,998,900 (65%)	7,132,500 (61%)	24,682,800 (71%)	23,183,600 (42%)
State	5,421,400 (6%)	995,600 (9%)	2,498,400 (7%)	1,927,400 (36%)
Other	5,374,100 (6%)	1,900 (<1%)	13,900 (<1%)	5,358,300 (99%)

Source: Manier et al. 2013, p. 118

Due to the patchwork distribution of land ownership, BLM actions the conservation results obtained on any ownership are limited unless conservation actions are enacted across ownership boundaries.

Planning Area Habitat Conditions and Management

Sagebrush, primarily Wyoming big sagebrush, is the most dominant shrubland type in the planning area, but mountain big sagebrush also occurs. Wyoming big sagebrush tends to grow in the low to mid elevations on the drier sites, while mountain big sagebrush occurs in upper elevations in moister conditions. Vegetation communities in the planning area are naturally patchy because they represent a transition between the intermountain basin sagebrush communities to the west and the prairie communities to the east. The grasslands of the planning area are substantially threatened by conversion to agriculture, or tillage (see **Chapter 3**).

In Montana, the GRSG population declined sharply from 1991 to 1996 before increasing in the early 2000s. In LFO, lek data have been collected since 1952. The number of males per lek has declined from approximately 30 to 10 males per lek over this period; however, not all leks were consistently counted during this period. In 2012-13 82 leks were active with an average of 10 males each (see **Chapter 3**). The highest recent male count for LFO leks in priority habitat was 2103 males in 2003 on 81 active leks (of 120 total surveyed). The overall trend in LFO lek counts appears stable (Beyer et al. 2010), though average lek size is declining. In portions of MZ 1, GRSG populations have declined through wholesale loss of habitat and through impacts of disturbance and direct mortality to birds on the remaining habitat. The most pervasive and extensive change to the sagebrush ecosystems in MZ 1 is the conversion of nearly 60 percent of native habitats to agriculture (Samson et al. 2004). The COT report considers the Yellowstone Watershed population potentially at risk of extirpation (USFWS 2013).

LFO RMPA Alternatives

The LFO RMPA/EIS evaluated the following alternatives:

- Alternative A, current management (the No Action Alternative)
- Alternative B, which emphasizes conservation of physical, biological, cultural, and visual resources, with constraints on resource uses on BLM-administered lands in PHMA,
- Alternative C, which emphasizes conservation of resources, with constraints on resource uses on BLM-administered lands in both PHMA and GHMA,
- Alternative D seeks to balance competing human interests and resource uses with the conservation of natural resource values.
- Proposed Plan Amendment provides consistent GRSG habitat management across the range, prioritizes development outside of

GRSG habitat, and focuses on a landscape-scale approach to conserving GRSG habitat.

Though currently GRSG are not managed using PHMA and GHMA designations, for comparison purposes in the data tables in **Section 5.3.5** below, delineates acreages by PHMA and GHMA for both the planning area and for MZ I as a whole.

Population Trends in Management Zone I

GRSG has been extirpated from almost half of its original range in MZ I; populations continue to decline by 2 to 4 percent annually (Manier et al. 2013). The MZ I GRSG population was estimated to be 14,814 males in 2007, having declined 17 percent in the number of males per lek since 1965. The number of leks declined by 22 percent over the same period (Manier et al. 2013). Lek counts indicate a 67 percent drop in MZ I from 2007 to 2013 (Garton et al. 2015).

Wyoming data suggest a cyclical pattern, with population lows in 1995, 2002, and 2013, and peaks in 2000 and 2006. Actual trends are difficult to discern due to the smaller survey before 2007, meaning the number and proportion of active to inactive leks is unknown. Since 2007, the number of active leks has remained stable (approximately 1,100 active leks), but the number of males per active lek has declined by more than half, from 42 to 17. In northeast Wyoming, the decreasing number of active leks since 2007 suggests a population decline in that area that is greater than that indicated by the average lek size. Similar population trends are suggested at both state and local scales (Christiansen 2013). Northern Montana population dropped 54 percent to 1,667 males in 2013, while the Yellowstone Watershed population dropped 65 percent to 3,045 males (Garton et al. 2015).

Similarly, in Montana, the GRSG population changes cyclically. The GRSG population declined sharply from 1991 to 1996, before increasing through 2000 (Montana Sage Grouse Work Group 2005). The population is thought to be down 33 percent from historic levels. Between 2004 and 2013, the average number of displaying males per lek in a given year in Montana ranged from 7 to 19 (Greater Sage-Grouse Habitat Conservation Strategy 2014). The Powder River Basin population dropped 76 percent from 2007 to 2013, to 1,651 males (Garton et al. 2015).

In the Dakotas, GRSG numbered approximately 300 male birds on leks in 2013, a drop of 72 percent from 2007 (Garton et al. 2015). Although North and South Dakota populations remain connected to populations in Montana, their small size, situation on the edge of GRSG range, and ongoing threats place them at high risk (Manier et al. 2013, p. 127; USFWS 2013).

5.3.4 Regional Efforts to Manage Threats to GRSG

Across the GRSG range, other BLM and Forest Service sub-regions are undergoing RMP revision or amendment processes similar to this one for the Lewistown Field Office. The Proposed RMP or RMPA/Final EIS associated with each of these efforts has identified a Proposed Plan or Proposed Plan Amendment 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 or Proposed Plan Amendments would cumulatively decrease the threat of GRSG habitat loss and would 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 protective management actions in priority and general habitat areas.

The BLM has incorporated management of SFAs into its proposed management approach for GRSG. SFAs are a subset of PHMA and represent recognized "strongholds" for the species that have been noted and referenced by the conservation community as having the highest densities of the species and other criteria important for the persistence of the species. Those portions of SFAs on BLM-administered lands would be petitioned for withdrawal from mineral entry, subject to an NSO stipulation with no exceptions, modifications, or waivers, and are prioritized for management and conservation actions, including, but not limited to, review of livestock grazing permits/leases. The LFO planning area contains a portion of the 1,807,600-acre North Central Montana SFA. In addition, there are several regional efforts to manage threats to GRSG in MZ I. These efforts may have a greater ability to alleviate threats to GRSG than BLM actions. This is because state and private lands account for approximately 35 million acres (approximately 75 percent) of GRSG habitat in MZ I (Manier et al. 2013, p. 118).

The WAFWA Sage-Grouse Strategy (Stiver et al. 2006) outlines a plan for monitoring, research, outreach, and funding for 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.

South and North Dakota Statewide Efforts

The South Dakota Department of Game, Fish and Parks published its Sage-Grouse Management Plan in 2014 (South Dakota Wildlife Division 2014). While the plan does not address disturbance caps or impose restrictions that are required, it is designed to provide biological information about sage-grouse, identifies factors that influence sage-grouse in South Dakota, and guides future management direction and actions by establishing objectives to:

- Maintain or increase/improve the existing status and range of sagebrush steppe habitat in South Dakota
- Use results from lek counts and inference from past hunting seasons to guide recommendations for the annual hunting season
- Annually monitor GRSG population status and distribution
- Develop a public outreach and educational plan that informs the public, landowners, stakeholders, and wildlife conservation agencies on GRSG management and the issues of highest concern in South Dakota
- Support local, interstate and interagency GRSG research projects and collaborative conservation planning efforts
- Document disease outbreaks and develop management responses

The NDGFD has developed its Management Plan and Conservation Strategies for Greater Sage-Grouse in North Dakota (Robinson 2014). The purpose of the plan is in part to meet the objectives outlined in the COT report (USFWS 2013), which include:

- Stop population declines and habitat loss
- Implement targeted habitat management and restoration
- Develop and implement GRSG conservation strategies and associated actions and regulatory mechanisms
- Develop and implement proactive, voluntary conservation actions
- Develop and implement monitoring plans to track success of conservation strategies
- Prioritize, fund, and implement research to address existing uncertainties

Similar to the South Dakota plan, the North Dakota plan does not address disturbance caps or impose required restrictions but instead is intended to provide biological information on GRSG in North Dakota and be used as the conservation framework to minimize impacts to GRSG in North Dakota across all land ownerships.

Wyoming Statewide Efforts

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 (WSGWG) was formed to develop a statewide strategy for GRSG conservation. This group prepared the Wyoming GRSG Conservation Plan (WSGWG 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. The Northeast Wyoming Sage-Grouse Conservation Plan was completed in 2006 and was updated in 2014 (Northeast Wyoming Sage-grouse Working Group 2014). The local and regional working group plans would assist in GRSG conservation through monitoring, public awareness, and voluntary conservation actions on private land.

Wyoming Executive Order. 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 the State's Core Population Area Strategy (Core Area Strategy) as an approach to balancing GRSG conservation and development. It also provides an approach to mitigating human disturbances to GRSG.

The Wyoming executive order applies to state trust lands starting in 2008. These trust lands cover almost 23 percent of GRSG habitat and benefit approximately 80 percent of the estimated breeding population in the state (USFWS 2010). All proposed activities are evaluated through a density/disturbance calculation tool to determine if the project would exceed recommended density/disturbance thresholds. Additionally, the order has stipulations to be included in such permits, with varying restrictions, depending on whether the proposed development activity occurs within or outside delineated Core Population Areas (Wyoming Executive Order, June 2, 2011).

In Core Areas, there is a 0.6-mile no NSO buffer around occupied leks and restrictions on activities in breeding and winter concentration habitat. Wyoming's Industrial Siting Council, which permits large development projects on all lands in the state, is subject to the terms of the executive order. This buffer provides protection for males during lekking season and acts in coordination with the density disturbance cap. The combination of protections could offer GRSG considerable regulatory protection when large wind energy and 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 75 percent of their current populations could increase from 20 to 25 under long-term scenarios (Copeland et al. 2013). Combining the Core Area Strategy with $250 million in target

conservation easements (provided willing landowners and funding are available) could reduce population declines by another 9 to 11 percent (Copeland et al. 2013).

In BLM planning areas in Wyoming, however, the Core Area Strategy may be less protective than in other areas, because much development in GRSG habitat has already occurred and populations are already in decline. As stated in the Viability Analysis for Conservation of Greater Sage-Grouse Populations for the Buffalo Field Office (Taylor et al. 2012), Core Areas in northeastern Wyoming were delineated only after widespread development had already occurred in GRSG habitat, leaving few options for conserving populations in this region.

Core Population Areas in Wyoming also incorporate connectivity corridors (Wyoming Executive Order 2011). These are areas GRSG use to maintain connectivity between habitat areas (Manier et al. 2013). Connectivity reduces isolation, thereby also reducing a population's vulnerability to disease, drought, or other events that may result in extirpation.

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 to 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).

Montana Statewide Efforts

The MFWP is tasked with implementing the range-wide WAFWA Sage-Grouse Strategy (Stiver et al. 2006) in Montana.

In addition, the MFWP's 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 active leks in Core areas (0.25 mile in GHMA) for new activities;
- A minimum 0.6-mile avoidance zone for power lines and towers;
- A minimum 2.0 mile buffer from lek perimeter for main roads and a 0.6 mile buffer for facility site access roads
- A 5 percent limit on anthropogenic surface disturbance.
- Limits on activity during nesting season in Core population areas

The approach of the Montana executive order and conservation strategy 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 timing limitations. The 0.6-mile buffer would protect males in the vicinity of 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.

Powder River Basin Restoration Program

The Powder River Basin Restoration Program is a collaborative partnership to restore and enhance GRSG habitat on a landscape level in the Powder River Basin. The basin encompasses 13,493,840 acres in northeast Wyoming and southeast Montana. Surface ownership is comprised of approximately 70 percent private lands, 14 percent BLM-administered lands (including 8 percent in Wyoming and 6 percent in Montana), 8 percent National Forest System lands, and 8 percent States of Wyoming and Montana lands. Subsurface mineral ownership is 50 to 60 percent federal (BLM 2015).

The Powder River Basin Restoration Program is focusing on areas affected by the federal oil and gas development that has occurred over the past decade in the Powder River Basin in northeastern Wyoming. Its objectives are restoring or enhancing disturbed previously suitable habitat to suitable habitat for sagebrush obligate species, primarily GRSG. This includes multiple sites affected by coal bed natural gas abandonment reclamation efforts, wildfires, and noxious

and invasive plants. Priority will be given to those areas recognized as priority habitats (e.g., Core Population Areas and connectivity corridors).

Habitat objectives are meeting the needs for nesting, brood-rearing, and late brood-rearing. The program would contribute to efforts focused on the management and control of mosquitoes carrying West Nile virus and would include funding, labor, treatment locations, and other needs as determined.

Additionally, efforts would be coordinated to reduce fuels in and near GRSG habitat, in order to enhance sagebrush stands, support restoration efforts, and reduce the risk of high severity wildfire. Pine stands and juniper woodlands would be managed for structural diversity and to reduce fuels, especially near PHMA, human developments, and recreation areas.

Natural Resource Conservation Service Sage Grouse Initiative

The NRCS SGI 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), and over 65 percent in MZ 1 (Manier et al. 2013, p. 118), a unique opportunity exists for the NRCS to benefit GRSG and ensure the persistence of large and intact rangelands by implementing long term contracts and conservation easements.

Participation in the SGI program is voluntary, but willing participants enter into binding contracts to ensure that conservation practices that enhance GRSG habitat 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 SGI. 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 SGI generally require reauthorization from Congress under subsequent farm bills, meaning future funding is not guaranteed.

As of 2015, SGI 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). In MZ 1, SGI has thus far secured conservation easements on 65,881 acres that maintain intact sagebrush-grassland habitat. SGI has also accomplished the following in MZ 1:

- Established grazing management programs on 1,370,000 acres to enhance GRSG habitat and sustainable ranching
- Removed conifers encroaching on 181 acres of GRSG habitat

- Seeded over 7,500 acres with native plants
- Marked over 350 miles of fences

Other Regional Efforts

The Forest Service is preparing a plan to manage nearly 96,000 acres of GRSG habitat in the Dakota Prairie National Grassland. The plan is not yet available for review but is likely to propose similar protections for GRSG on its lands as are included in the BLM Proposed RMPs or RMPAs/Final EISs.

A programmatic EIS by the Western Area Power Administration (WAPA) and the USFWS for the entire upper Great Plains will focus future wind energy developments in specific corridors outside of GRSG core habitat (WAPA 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.

In addition, tribes, counties, and local working groups are playing a critical role in promoting GRSG conservation at the local level. 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 on 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.

Some local working group conservation plans recommend restricting resource uses as well. For example, the Bates Hole/Shirley Basin Conservation Plan (Bates Hole/Shirley Basin Sage-grouse Working Group 2007) recommends that areas within 3.4 miles of an occupied GRSG lek not be leased for oil and gas development unless mitigation plans have been developed, approved, and funded. In North and South Dakota, local working groups use each state's respective conservation plan, as described under South and North Dakota Statewide Efforts above. Local working group GRSG conservation plans in MZ I include the following:

- Bates Hole/Shirley Basin (Bates Hole/Shirley Basin Sage-grouse Conservation Plan (2007)
- Big Horn Basin (Sage-Grouse Conservation Plan for the Big Horn Basin, Wyoming (2007)

- Northeast Wyoming (Powder River Basin) (Northeast Wyoming Sage-grouse Conservation Plan (2014)
- Glasgow (A Summary of Conservation Activities of the Glasgow, MT Sage-Grouse Local Working Group (2011)
- Miles City/Forsyth (Miles City Sage-Grouse Local Working Group Action Plan 2011-2014)
- Central Montana Organized Conservation District (no local conservation plan)
- North Dakota (no local conservation plan)
- South Dakota (no local conservation plan)

5.3.5 Relevant Cumulative Actions

This CEA considers the incremental impact of the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS alternatives in combination with other past, present, and reasonably foreseeable future federal and non-federal actions on all lands in MZ I. Where these actions occur within GRSG habitat, they would cumulatively add to the impacts of BLM-authorized activities set forth in the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS. In addition to the conservation efforts described above, relevant reasonably foreseeable future actions occurring on federal, private, or mixed landownership in MZ I are described in the South Dakota, Buffalo, Miles City, HiLine, Billings, and Wyoming GRSG Planning Area RMPs, and North Dakota RMPA.

The following list includes past, present, and reasonably foreseeable future actions in MZ I that when added to the Proposed Plan Amendment and alternatives for the LFO planning area could cumulatively affect GRSG (see **Table 5-11** for more detail):

- Powder River Basin oil and gas leases in Campbell, Johnson, and Sheridan Counties, Wyoming
- Surface coal mining and coal leasing in Powder River Basin, Wyoming
- Carter Master Leasing Plan for Oil and Gas, Carter County, Montana
- Increased oil and gas production surrounding the established fields in the southern Williston Basin
- Greater Crossbow Oil and Gas Exploration and Development Project in Campbell and Converse Counties, Wyoming
- Converse County Oil and Gas Development, Converse County, Wyoming
- Nichols Ranch/Hank Unit Uranium In-situ Recovery Mining Project, Johnson and Campbell Counties, Wyoming

- Proposed uranium mining in Newcastle, Wyoming and in South Dakota
- Western Area Power Administration Upper Great Plains Wind Energy Programmatic Draft EIS
- Bentonite mining in northeast Wyoming and in Carter County, Montana
- Keystone XL Pipeline, Montana and South Dakota
- Conversion of lands to agricultural and urban development
- Conifer removal projects in MZ I (and in Belt Mountains, MZ IV)

5.3.6 Threats to GRSG in Management Zone I

The COT report identifies the present and widespread threats facing GRSG in MZ I as energy development, infrastructure, grazing, conversion to agriculture, fire, spread of weeds, and recreation (USFWS 2013). 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 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 as a result of climate change.

Each COT report threat considered present and widespread in at least one population in MZ I is discussed below. For more detail on the nature and type of effects and the direct and indirect impacts on GRSG in the planning area, see **Chapter 4** of the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS. The quantitative impact analysis focuses on impacts in MZ I, with planning area acres provided for context.

Energy Development

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 2013). In the energy development areas of MZ I, population trends are not stable or increasing; for this reason, objectives in the planning area are intended to reduce losses and sustain a viable GRSG population, albeit at a lower level than historically (Taylor et al. 2012).

There are approximately 1,004,400 acres of GRSG habitat in MZ I where energy and mineral development (including oil and gas, coal leasing, mineral materials, and locatable minerals) is presently occurring. There are 33,264,000 acres indirectly influenced by energy development (Manier et al. 2013, pp. 55-71). No geothermal energy development or nonenergy leasable mineral development is presently occurring in MZ I. Impacts from these activities would be similar to other types of mining and energy development. However, since these resources are not present in the MZ, restrictions related to the development of these resources have no impact on GRSG populations.

Oil and Gas

Nature and Type of Effects. Oil and gas development has emerged as a range-wide issue in conservation because areas being developed contain large GRSG populations (Connelly et al. 2004) and other sagebrush obligate species (Knick et al. 2003). As discussed in **Chapter 4**, 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 well as direct mortality from vehicle strikes and disturbance from noise. Oil and gas development also indirectly impacts GRSG through the species' avoidance of infrastructure and disturbance from increased noise and vehicle traffic associated with development. This development can also impact GRSG survival or reproductive success. Other indirect effects include habitat quality changes, predator communities, and disease dynamics (Naugle et al. 2011).

Several studies from the Great Plains and Wyoming Basin have shown that breeding GRSG populations are affected at oil and gas well densities commonly permitted in Montana and Wyoming in the past (Naugle et al. 2011). Doherty et al. (2010) found that, although impacts were indiscernible at densities of less than one well per square mile, lek losses in parts of MZ I were two to five times greater in areas with development above this threshold. They also found that the abundance (number) of males per lek at the remaining leks declined by approximately 30 to 80 percent. These and other studies demonstrate that both direct and indirect impacts result from the impacts of energy development and geophysical exploration in GRSG habitat.

Several studies have quantified the distance from leks at which impacts of development become negligible. The studies also assessed the efficacy of BLM NSO stipulations for leasing and development within 0.25 mile of a lek (Holloran 2005; Walker et al. 2007a). Walker et al. (2007a) found that in the

Powder River Basin buffer sizes of 0.25, 0.5, 0.6, and 1.0 mile resulted in an estimated lek persistence (the ability of leks to remain on the landscape) of approximately 5, 10, 15, and 30 percent; conversely lek persistence in areas without oil and gas development averaged approximately 85 percent.

Naugle et al. (2011) reported that impacts of energy development had been documented at distances greater than 3.5 miles from the lek in MZ I. Holloran (2005) found impacts on abundance at a distance between 3 and 4 miles in western Wyoming. However, Naugle et al. (2011) also stated that impacts on leks caused by energy development were most severe near the lek.

Naugle et al. (2011) also found that impacts from energy development often extirpate leks in gas fields. Doherty (2008) documented that lek losses increased and male abundance decreased as well density increased in the Powder River Basin. Lek extirpation in areas with 8 wells per section (40 to 100 wells total) within 2 miles of the lek was 5 times more likely to occur than in areas with no wells within 2 miles. Male attendance at the remaining leks in these areas declined approximately 20 to 60 percent (Doherty 2008).

Much oil and gas development previously occurred on private lands with minimal mitigation efforts, but restrictions are now in place to protect GRSG habitat under the Wyoming and Montana executive orders (though the Montana executive order still requires funding for implementation). Earlier research had demonstrated that 0.25-mile NSO lease stipulations were insufficient to conserve breeding GRSG populations in a typical landscape in portions of the planning area (Walker et al. 2007a), when nearly 80 percent of the area within approximately 2 miles of leks remained open to full-scale development.

Lyon and Anderson (2003) reported that oil and gas development influenced the rate of nest initiation of GRSG in excess of approximately 2 miles of construction activities. GRSG numbers on leks within approximately 1 mile of natural gas compressor stations in Campbell County, Wyoming, were consistently lower than numbers on leks unaffected by this noise disturbance (Braun et al. 2002). Holloran and Anderson (2005) reported that lek activity decreased downwind of drilling activities, suggesting that noise caused measurable impacts.

In addition to activities directly associated with oil and gas development, road traffic also generates noise. Knick et al. (2003) indicated that there were no active GRSG leks within approximately 1 mile of Interstate 80 across southern Wyoming; only 9 leks were known to occur between approximately 1 and 2.5 miles of Interstate 80.

Conditions in the Planning Area and in MZ I. The Dakotas population in MZ I is heavily influenced by oil and gas development; oil and gas developments are scattered throughout the Yellowstone watershed (USFWS 2013, p. 63). Energy development is a widespread threat to GRSG in MZ I. The patchwork

landownership pattern means that many energy extraction facilities are near property boundaries and may affect GRSG and their habitat on adjacent lands. Nearly 16 percent of GRSG habitat in MZ I is within 1.8 miles of oil and gas wells, a distance at which ecological impacts are likely to occur (Knick et al. 2011). Oil and natural gas development-related wells indirectly influence 60 percent of PHMA and GHMA across MZ I, occurring to a distance of 12 miles from the development. Private surface lands account for 65 percent of wells in PHMA and 72 percent in GHMA in MZ I (Manier et al. 2013). Thus, conservation actions on private land are likely to have a greater potential to reduce the adverse impacts of oil and gas development on GRSG habitat than any other single land management entity.

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 I are influential. Federal actions on split-estate lands with federal subsurface minerals will require mitigation for impacts on GRSG habitat occurring on private surface lands that would not be required on lands with both privately held surface and subsurface.

From 2001 to 2005, GRSG populations declined by 82 percent within the expansive coal bed natural gas fields (Walker et al. 2007a) in northeast Wyoming. Within the Lewistown planning area, energy development is less widespread than in Wyoming.

Oil and gas development has emerged as a range-wide issue in conservation because areas being developed contain large GRSG populations (Connelly et al. 2004) and other sagebrush obligate species (Knick et al. 2003). The Powder River Basin has had extensive development of coalbed natural gas in the last 10 to 15 years, fragmenting GRSG habitat throughout that area. With a well life of approximately 12 years, many of the coal bed natural gas wells that were originally drilled are depleted and ready for abandonment. Native vegetation over most buried pipelines has reclaimed its predisturbance composition. Utility roads and overhead power lines continue to degrade thousands of acres of GRSG habitat on private, federal, and state lands resulting in avoidance of otherwise suitable habitat (BLM 2013b).

The intermingled land ownership pattern in MZ I means that many oil and gas facilities are near property boundaries and may have adverse effects on GRS and their habitat on adjacent lands. As a result, coordination of GRSG conservation efforts among federal, state and private entities is especially critical.

Though the BLM may restrict future leasing for oil and gas on Federal fluid mineral estate that it administers in GRSG habitat, existing leases remain valid unless they have already been developed, at which point they are valid for the life of the producing well. Any new development of wells on existing leases is subject to COAs to avoid other resource damage, including GRSG.

Oil and gas drilling is less prevalent in LFO than in other parts of MZ I, such as that portion in Wyoming (e.g., the Powder River Basin, the Bowdoin Field, and the Williston Basin). See **Chapter 3** for acres of existing BLM-administered surface minerals and federal subsurface mineral leases within the planning area. Since 1988, because of a protest resolution, the LFO has been deferring nominated oil and gas lease parcels that require a special lease stipulation to protect important wildlife values.

The Dakotas population in MZ I is heavily influenced by oil and gas development; oil and gas developments are scattered throughout the Yellowstone watershed (USFWS 2013, p. 63). The Powder River Basin contains substantial energy resources, including oil, natural gas, and coal bed natural gas (USFWS 2013, pp. 64-65); conversely, the northern Montana population has less energy development. Coal bed methane wells typically last 12 to 18 years, while oil and gas wells may last 20 to 100 years in production (Connelly et al. 2004). Most coal bed natural gas drilling in the Powder River Basin has concluded, and current and future oil and gas development is anticipated to impact GRSG less due to horizontal drilling technology.

Impact Analysis. No quantitative data are presented for fluid mineral leasing within LFO because there is an existing protest resolution decision affecting lands managed within the LFO. The protest resolution does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PHMA and GHMA. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS. Under all alternatives, future leasing is being deferred in this RMPA.

Alternative A does not describe future oil or gas projects in the planning area but does state that in unleased areas, federal leases would be deferred to protect wildlife habitat. Under Alternatives B, C, and D leased mineral estate drilling is limited in PHMA to valid existing rights or new exploration intended to provide information on resources located outside PHMA. For valid existing leasing rights, RDFs (see **Appendix C** and **Appendix D**) would be applied to the permits to drill as COAs to protect GRSG. Management under Alternative C further stipulates that exploration would be subject to seasonal restrictions precluding activities in GRSG breeding, nesting, and brood-rearing habitat. Management under Alternative C provides the strictest limits on leased fluid minerals and would be most protective of GRSG habitat on BLM-administered lands.

In the event of future new leasing for fluid minerals, the Proposed Plan Amendment would apply NSO stipulations to all PHMA.

Despite deferment of BLM-administered lands for oil and gas leasing, the RDFs in **Appendices C** and **D**, would help protect unfragmented habitats, minimize habitat loss and fragmentation, and maintain conditions that meet GRSG life history needs when applied to new drilling activities on parcels already leased. 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. Given the extent of oil and gas resources present in MZ I, development pressure is likely to continue in areas inhabited by the Yellowstone Watershed population, and oil and gas development is expected to remain a threat to GRSG populations in MZ I because restrictions on other lands are less stringent.

Implementing any alternative under the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS would not affect pending or future oil and gas development projects outside of the planning area. For example, the Converse County Oil and Gas Project proposes to drill approximately 5,000 oil and natural gas wells in an area encompassing 1.5 million acres (including GRSG core habitat) in MZ I. However, the NSO buffer and the disturbance caps under the Wyoming and Montana Executive Orders would reduce the threat to GRSG from oil and gas development on non-federal lands in those states in MZ I.

The effect of the alternatives and other conservation actions in the MZ (most notably the Montana 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.

Development pressure for fluid mineral resources in the Dakotas, Powder River Basin, and Yellowstone Watershed is likely to continue; however, future drilling technologies are expected to impact GRSG less than coal bed natural gas development has in the past decade. The application of major stipulations and closing areas to leasing would greatly reduce impacts to GRSG on federal mineral estate and the application of lek buffers and disturbance limitations would further reduce impacts on GRSG populations.

The Proposed Plan Amendment in the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS would continue the current protest resolution deferring new leasing. Thus, under all alternatives the effects on GRSG from the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS would be the same. However, continuation of the deferral approach in conjunction with actions, including implementation of NSO stipulations, anthropogenic disturbance caps, and adaptive management in other

planning areas, under other BLM RMP proposed plans, and past, present, and reasonably foreseeable future actions in MZ I would provide a net conservation gain to GRSG.

Coal

Nature and Type of Effects. Past and current coal extraction has been and continues to be a major mining activity in MZ I. Approximately 3 percent of BLM-administered PHMA in MZ I and 8 percent of GHMA is influenced by coal mining (Manier et al. 2013). Surface mining accounts for about 67 percent of production in the United States; large mines can cover many square miles. Coal mining and the use of coal to produce electricity has environmental impacts. These are soil erosion, dust, noise, water pollution, acid-mine drainage, and air emissions, in addition to impacts on wildlife in the area, and contributions to climate change.

Conditions in the Planning Area and in MZ I. The Powder River Basin in Wyoming and Montana contains some of the largest accumulations of low-sulfur sub-bituminous coal in the world. It is the nation's largest coal-producing region, and coal from the region is shipped nationwide. Coal forecasts for the Powder River Basin through 2020 indicate total production is expected to grow at an annual rate of 2 to 3 percent. This is consistent with electric power demand. Interest and demand for new leasing is expected to continue through 2020, based on forecasting. The preliminary work for the 2030 forecast indicates a slower rate of increase in the Powder River Basin, 0.25 to 2 percent. This is based on reduced coal demand, new natural gas discoveries, and possible regulation of greenhouse gases. By 2030 the BLM expects Powder River Basin coal production to be between 500 and 700 million tons annually, though more recent projections indicate lower coal demand because of increased supply of natural gas.

Coal surface leases indirectly influence 3 percent of PHMA and 8 percent of GHMA across MZ I. Coal is estimated to impact habitat to a distance of 12 miles from the direct impact area (Manier et al. 2013). Approximately 68 percent of coal leases in PHMA and 82 percent in GHMA occur on private lands in MZ I but may contain federal mineral estate (Manier et al. 2013). Protective stipulations would be of particular benefit on privately owned surface and subsurface lands where the BLM's protective regulatory mechanisms would not apply.

Impact Analysis. Major coal leasing and development areas lie outside the planning area. Areas proposed for coal exploration would be evaluated for their suitability for leasing through application of unsuitability criteria. With the emphasis of GRSG and their habitat, it is probable that GRSG habitat would be designated as unsuitable with or without exception. It is unlikely that existing mines, including adjacent areas proposed for mine expansion, would be designated as unsuitable without exception. Although coal companies have

repeatedly demonstrated that disturbed lands can be restored to a point that supports a diversity of vegetative species, including big sagebrush, there is little evidence in Montana that GRSG populations have reoccupied habitat disturbed by coal mining, at least in terms of lek establishment. Presently there is low coal potential in GRSG habitat in the planning area.

Coal development that requires state agency review or approval would be subject to the permitting process and stipulations for development in GRSG Core areas under the Wyoming and Montana executive orders, as well as BLM review under the Proposed Plan Amendment. There are no coal leases in WY Core Areas; however there are Core areas in the Miles City planning area with active and pending coal leases and mines.

New coal lease applications on federal mineral estate would be subject to 43 CFR, Part 3461.5(o)(1), Criterion 15. This criterion states that a lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining would not have a significant long-term impact on a "resident species of fish, wildlife, and plants of high interest to the state" such as GRSG. Special conditions would be required, as identified during the leasing process, to protect GRSG habitat. The requirements of 43 CFR, Part 3461.5, Criterion 15, in combination with BLM planning efforts and state plans, and other past, present, and reasonably foreseeable future actions, would help reduce the threat from coal extraction and provide a net conservation gain to GRSG in MZ I.

Mineral Materials

Nature and Type of Effects. Development of surface mines (for sand, gravel and other common mineral materials found in MZ I) 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).

Conditions in the Planning Area and in MZ I. Salable mineral materials disposal sites in PHMA and GHMA are widespread throughout MZ I. They are primarily located in northeast Wyoming, as well as in southeast Montana. There are 65,000 acres of mining and mineral materials disposal sites (not including minerals mined as energy sources) on BLM-administered surface land in MZ I. There are 122,900 acres across all landownership types. Indirect effects are estimated to 1.5 miles out from the direct effects area (Manier et al. 2013). Mineral materials currently being developed for commercial purposes in the LFO planning area consist primarily of aggregate (sand and gravel).

Across MZ I, PHMA and GHMA are most affected by mining and mineral materials disposal sites on private land surface. 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, 53 percent of PHMA and 80 percent of GHMA influenced by the indirect impact of mining and mineral materials disposal sites are on private land. This does not include minerals mined as

energy sources. Mining and mineral materials disposal sites on BLM-administered surface land, by comparison, indirectly affect 38 percent of PHMA and 11 percent of GHMA (Manier et al. 2013).

Impact Analysis. Closures or restrictions on mineral material development in the planning area would reduce adverse effects on GRSG from mineral material development on BLM-administered surface and split-estate lands. However, these actions may shift development onto non-federal lands, with potentially greater impacts on GRSG because protective stipulations and permit requirements would not apply. **Table 5-3** shows areas open and closed to mineral material disposal in GRSG habitat.

Table 5-3
Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Open to Mineral Material Disposal				
Alternative A	1,845,000	0	8,260,000	0
Alternative B	1,845,000	0	8,260,000	0
Alternative C	1,845,000	0	8,260,000	0
Alternative D	2,124,000	13	8,421,000	2
Proposed Plan Amendment	1,845,000	0	8,421,000	2
Closed to Mineral Material Disposal				
Alternative A	3,586,000	0	700,000	<1
Alternative B	3,971,000	10	700,000	<1
Alternative C	3,865,000	7	977,000	17
Alternative D	3,586,000	0	700,000	<1
Proposed Plan Amendment	3,865,000	7	700,000	<1

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to mineral material disposal in MZ I; it also displays the percentage of those acres that are found within the planning area.

Acres of PHMA and GHMA open to mineral material disposal in MZ I would be less under the Proposed Plan Amendment than under Alternative D. It is unclear if this represents an increase compared to current management.

Alternative B or the Proposed Plan Amendment provides the most protection to GRSG from mineral material disposal, especially by closing habitat to mineral materials disposal in the planning area except for free use permits. Because the Proposed Plan Amendment closes both PHMA and GHMA, it would reduce impacts more than any other alternative and would provide the greatest conservation gain to GRSG.

Under the Wyoming and Montana Executive Orders, authorizations of new mineral material disposal sites that require state agency review or approval would be subject to the GRSG permitting process. They also would be subject to stipulations for development in GRSG Core areas. These stipulations would be of particular benefit on privately owned surface and subsurface lands, where BLM protective regulatory mechanisms do not apply.

Overall, the combination of BLM management actions for mineral materials development in the Proposed Plan Amendment for the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS, the Wyoming and Montana state actions, and other planned restoration activities would preserve more habitat from disturbance than current management, reduce disturbance to birds, and in combination with other past, present and reasonably foreseeable future actions, provide the greatest net conservation gain to GRSG in MZ I.

Locatable Minerals

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 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 Planning Area and in MZ I .The LFO planning area has been mined for gold, zinc, sapphires, and other locatable minerals. However, none of the areas currently identified having locatable mineral development potential in the planning area is within PHMA or GHMA. In other parts of MZ I most current and forecasted extraction activities are for bentonite, but uranium is also being actively mined in GRSG habitat.

Impact Analysis. As shown in **Table 5-4** quantitative data on the number of acres of GRSG habitat recommended for withdrawal in MZ I are limited. However, the data represent a relatively small influence, compared to the broader MZ.

The Proposed Plan Amendment has fewer acres open to locatable mineral entry than Alternative D. Under the Proposed Plan Amendment, acreage in SFAs would be recommended for withdrawal from locatable mineral entry. Under Alternative B, PHMA would be recommended for withdrawal from locatable

Table 5-4
Acres Open and Recommended for Withdrawal from Mineral Entry in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Open to Mineral Entry				
Alternative A	3,854,000	0	7,029,000	0
Alternative B	3,854,000	0	7,029,000	0
Alternative C	3,854,000	0	7,029,000	0
Alternative D	4,133,000	7	7,190,000	2
Proposed Plan Amendment	4,080,000	6	7,190,000	2
Recommended for Withdrawal from Locatable Mineral Entry				
Alternative A	1,032,000	0	118,000	0
Alternative B	1,422,000	26	118,000	0
Alternative C	1,311,000	20	281,000	58
Alternative D	1,032,000	0	118,000	0
Proposed Plan Amendment	1,085,000	5	118,000	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 I; it also displays the percentage of those acres that are found within the planning area.

mineral entry, and, under Alternative C, both PHMA and GHMA would be recommended for withdrawal. Alternative D does not recommend withdrawal of any additional acres of GRSG habitat from locatable mineral development, and impacts from BLM management would be the same as Alternative A. Because Alternative B, C and the Proposed Plan Amendment would restrict future locatable mineral operations on GRSG habitat more than other alternatives, they would provide more protections to GRSG habitat from locatable mineral development.

No locatable mineral development is anticipated in the next 20 years and areas with potential are outside GRSG habitat, so these changes would not impact GRSG in LFO.

In other parts of MZ I, the Montana and Wyoming state plans will count locatable mineral development against their disturbance caps, meaning future development on private lands may trigger adaptive management protections for GRSG.

Under all alternatives, required design features outlined in **Appendix C** and **Appendix D** would help minimize the impacts on GRSG from locatable mineral development on federal land. Clustering operations and facilities as closely as

possible and placing new infrastructure in already disturbed locations would reduce impacts on sagebrush habitats.

The disturbance cap in the Proposed Plan Amendment would not block locatable mineral entry projects, but any locatable mineral entry would be considered as disturbance under the cap and could trigger adaptive management and associated benefits for GRSG. Overall, the measures in the Proposed Plan Amendment would help alleviate the threat, and in light of state plans, other BLM planning efforts, and other past, present, and reasonably foreseeable future actions, provide a net conservation gain to GRSG throughout MZ I.

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 Planning Area and in MZ I. Existing leases for nonenergy leasable minerals represent a relatively small threat spatially (Manier et al. 2013). Nonenergy leasable minerals occur in the planning area but not in commercially viable quantities. Therefore, implementing any of the alternatives would not reduce the threat in MZ I.

Impact Analysis. **Table 5-5** shows the results by alternative.

Table 5-5
Acres Open and Closed to Nonenergy Leasable Mineral Leasing in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Open to Nonenergy Leasing				
Alternative A	2,049,000	0	6,330,000	0
Alternative B	2,049,000	0	6,330,000	0
Alternative C	2,049,000	0	6,330,000	0
Alternative D	2,328,000	12	6,491,000	
Proposed Plan Amendment	2,049,000	0	6,491,000	2
Closed to Nonenergy Leasing				
Alternative A	2,285,000	0	670,000	<1
Alternative B	2,670,000	14	670,000	<1
Alternative C	2,564,000	11	830,000	20
Alternative D	2,285,000	0	670,000	<1
Proposed Plan Amendment	2,564,000	11	670,000	<1

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to nonenergy leasing in MZ I; it also displays the percentage of those acres that are found within the planning area.

The Proposed Plan Amendment would reduce the acreage open to nonenergy leasable minerals relative to Alternative D. Alternative D would have the same acreage closed in PHMA and GHMA as Alternative A, while Alternatives B, C and the Proposed Plan Amendment would reduce the acreage of PHMA and GHMA open to nonenergy leasing, compared to current management (Alternative A). The highest closed acreage would be under Alternative C, which also closes GHMA.

Precluding nonenergy leasable development in more acres of PHMA or GHMA would reduce habitat disturbance and fragmentation as well as direct disturbance to GRSG, if nonenergy leasable development were to occur in GRSG habitat in the future. The Proposed Plan Amendment would also apply a disturbance cap and lek buffers, in accordance with the USGS report, and mitigate for any damage in GRSG habitat. In combination with the disturbance cap applied under state plans and BLM actions in other RMP planning areas in MZ I, the Proposed Plan Amendment represents an improvement in GRSG habitat protections in MZ I, and in combination with other past, present, and reasonably foreseeable future actions, would provide a net conservation gain to GRSG if nonenergy leasable mineral development occurs in GRSG habitat.

Infrastructure

The USFWS (2013) considers energy development and associated infrastructure the largest threats to GRSG in MZ I. The COT report objective is to avoid development of infrastructure in GRSG priority areas for conservation. However, in the Powder River Basin, considerable infrastructure has already been constructed in GRSG habitat, making it necessary to focus GRSG management on minimizing impacts of infrastructure.

Rights-of-Way

Nature and Type of Effects. As discussed in **Chapter 4**, 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 facilitate predator movements, spread invasive plants, and increase human disturbance from noise and traffic (Forman and Alexander 1998).

Conditions in the Planning Area and in MZ I. Infrastructure, such as ROWs and associated facilities and urbanization, is widespread throughout MZ I. 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 I. The best available estimates suggest about 16 percent of the MZ I is within approximately 4 miles of urban development (Knick et al. 2011). Impacts of infrastructure development in MZ I are primarily related to highways, roads, power lines, and communication towers, with nearly 90 percent of MZ I within 4 miles of a road, 30 percent within 4 miles of a power line, and 4 percent within 4 miles of a communication tower (Knick et al. 2011). In the planning area most ROWs on BLM-administered lands are associated with oil and gas development, electrical transmission, irrigation ditches, and communications.

Although not representative of all infrastructure ROWs, transmission lines greater than 115 kilovolts indirectly influence 29 percent of PHMA and 46 percent of GHMA across MZ I. Indirect effects are assumed to occur to a radius of 4 miles (Manier et al. 2013). Approximately 68 percent of transmission lines in PHMA and 73 percent in GHMA are on private lands across GRSG habitats in MZ I (Manier et al. 2013). Therefore, actions on private lands are likely to have 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 lands could reduce the threat on these lands; however, the scattered federal landownership encourages routing infrastructure around federal lands, often increasing its length and impact. ROW avoidance and exclusion areas on BLM-administered lands could increase this tendency.

Applications for ROW authorizations may increase to accommodate development, such as residential development and increased use at communication sites, and some permits that do not require surface disturbance (e.g., film productions). In the planning area, ROW actions have increased from seven in 2006 to a high of 17 in 2009. In 2013, the LFO approved authorizations for fifteen actions for a total of over 35,000 acres of temporary surface disturbance, including approximately 50 acres of permanent disturbance from powerline and road ROWs.

Impact Analysis. **Table 5-6** lists the areas of ROW avoidance and exclusion in GRSG habitat by alternative.

Alternative A (current management) has the most acres open to ROWs in PHMA. The other alternatives all substantially reduce the number of open acres in PHMA, compared to Alternative A. In GHMA, Alternative D has the same open acreage as Alternative A, while the other alternatives represent a small reduction. For ROW exclusion, Alternative B excludes ROWs in PHMA while Alternative C excludes in PHMA and GHMA.

Alternative D and the Proposed Plan Amendment rely more on ROW avoidance than exclusion to protect GRSG habitat, with acreages comparable to those under current management. The avoidance approach preserves

Table 5-6
Acres of Rights-of-Way Designations in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Open to Rights-of-Way				
Alternative A	235,000	98	1,036,000	10
Alternative B	5,000	0	932,000	0
Alternative C	5,000	0	932,000	0
Alternative D	5,000	0	1,036,000	10
Proposed Plan Amendment	5,000	0	932,000	0
Right-of-Way Exclusion				
Alternative A	119,000	0	148,000	0
Alternative B	119,000	0	148,000	0
Alternative C	231,000	48	260,000	43
Alternative D	119,000	0	148,000	0
Proposed Plan Amendment	119,000	0	148,000	0
Right-of-Way Avoidance				
Alternative A	3,218,000	<1	2,258,000	<1
Alternative B	3,216,000	0	2,363,000	5
Alternative C	3,216,000	0	2,251,000	0
Alternative D	3,449,000		2,258,000	<1
Proposed Plan Amendment	3,449,000	7	2,363,000	5

Source: BLM 2015
This table displays the acres of PHMA and GHMA within rights-of-way designations in MZ I; it also displays the percentage of those acres that are found within the planning area.

management flexibility in situations where landownership is mixed. Flexibility is especially beneficial to GRSG leks and habitat in areas where rerouting ROWs across nonfederal land may result in more impacts on GRSG than direct routing across federal land.

The numbers of ROW authorizations are anticipated to grow across the MZ. Increasing populations, continued energy development, and new communication sites drive the need for new ROWs on BLM-administered lands and those lands not under BLM administration. There would be fewer potential ROWs under the Proposed Plan Amendment because of the anthropogenic disturbance cap that would limit development over the long-term. This would provide the greatest net conservation gain to GRSG.

New ROW authorizations that require state agency review or approval would be subject to the permitting process and development restrictions, including the disturbance cap, in GRSG Core Areas under the Proposed Plan Amendment, and also under the Wyoming and Montana executive orders, as discussed in **Section 5.3.4**. These stipulations would benefit GRSG in Core Areas by encouraging ROW development outside of Core Habitat Areas, enforcing lek buffers which restrict surface occupancy within 0.6 mile of occupied leks, prohibiting power lines greater than 115 kV outside of designated corridors, and locating new roads used to transport products or waste over 1.9 miles from occupied leks. These provisions would reduce disturbance to GRSG populations from human traffic, noise, and increased predation associated with tall structures.

As with fluid mineral development, reclamation practices may hold greater promise for ameliorating long-term impacts on GRSG and their habitat. If overhead power lines were removed; and roads reclaimed to mimic pre-disturbance conditions, GRSG populations would likely remain. However, recent research indicates that restored habitats lack many of the features sought by GRSG in their habitat areas, and may not support GRSG for long periods following restoration activities. In order to conserve GRSG populations on the landscape, protection of existing habitat through minimizing development, would provide the best hope for GRSG persistence (Arkle et al., 2014).

The effect of the alternatives and other conservation actions in the MZ (most notably the Montana and Wyoming executive orders) could be synergistic. 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.

In combination with these past, present, and reasonably foreseeable future actions and other BLM proposed plans in MZ I, the Proposed Plan Amendment would provide the greatest net conservation gain to GRSG in MZ I. It would accomplish this by providing the flexibility to work in concert with policies on state and private lands to site ROWs in areas with the least impact on GRSG habitat, thereby preserving larger blocks of unfragmented habitat for GRSG populations.

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 Planning Area and in MZ I. Solar energy has very low potential, while wind energy development is a growing presence in MZ I, though currently no applications have been submitted in the planning area. Wind turbines currently indirectly influence 1 percent of PHMA and GHMA across MZ I (Manier et al. 2013), but the American Wind Energy Association ranks Montana fifth in the nation for wind-energy potential and the planning area has wind resources consistent with utility-scale production. Projects continue to be proposed all across Montana. The LFO planning area has three wind sites on private lands with a total of 42 turbines, none located in PHMA or GHMA.

Impact Analysis. **Table 5-7** lists areas of wind energy ROW by alternative.

Table 5-7
Acres of Wind Energy Management Designations in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Open to Wind Rights-of-Way				
Alternative A	231,000	100	759,000	14
Alternative B	2,000	0	655,000	0
Alternative C	2,000	0	655,000	0
Alternative D	2,000	0	655,000	0
Proposed Plan Amendment	2,000	0	655,000	0
Wind Right-of-Way Exclusion				
Alternative A	2,560,000	0	479,000	0
Alternative B	2,793,000	8	479,000	0
Alternative C	2,793,000	8	591,000	1
Alternative D	2,793,000	8	479,000	0
Proposed Plan Amendment	2,793,000	8	479,000	0
Wind Right-of-Way Avoidance				
Alternative A	776,000	0	2,173,000	0
Alternative B	776,000	0	2,285,000	5
Alternative C	776,000	0	2,173,000	0
Alternative D	776,000	0	2,285,000	5
Proposed Plan Amendment	776,000	0	2,285,000	5

Source: BLM 2015
This table displays the acres of PHMA and GHMA within wind energy management designations in MZ I; it also displays the percentage of those acres that are found within the planning area.

In the planning area Alternative A maintains by far the most acreage in PHMA open to wind energy development. Alternatives B, C D, and the Proposed Plan Amendment, in conjunction with other BLM RMP proposed plans, are relatively similar in terms of their acreage allocations; resulting impacts would likewise be similar. Alternative C would have the largest exclusion acreage, and may push development onto adjacent lands.

The Proposed Plan Amendment and other action alternatives would close PHMA to wind energy development and would avoid wind energy in GHMA. Lek buffers would apply in GHMA if development were allowed. Across the MZ, acres of ROW avoidance and exclusion in GHMA and PHMA would increase compared to current management, reducing impacts from wind development, including disturbance and habitat degradation. Protecting GRSG habitat areas would protect existing populations of GRSG.

Wind energy development is a growing presence in MZ I, but a programmatic EIS by the WAPA and the Department of Energy for the entire upper Great Plains will focus future wind developments in specific corridors outside of GRSG Core habitat (WAPA 2013).

Private lands account for 72 percent of wind turbines affecting GRSG in PHMA and 87 percent in GHMA in MZ I (Manier et al. 2013). Therefore, conservation actions on private land are likely to have a greater potential to reduce the effects of wind energy development than federal actions. Projects that require state agency review or approval would be subject to the Wyoming executive order permitting process. This would encourage wind energy development outside of Core habitat areas and reduce impacts on GRSG in these important areas in Wyoming. The WAPA Programmatic EIS will also steer wind development outside GRSG Core habitat.

Impacts would be minimized on BLM-administered land across all alternatives by adhering to the wildlife protection provisions of the Wind Energy Development Programmatic EIS (BLM 2005). Implementation of wind energy closure in PHMA in the RMPA Proposed Plan Amendment, in combination with the disturbance caps under the WY state plan, exclusion zones in other BLM planning areas, the protections in the WAPA EIS, and other past, present, and reasonably foreseeable future actions, would provide a net conservation gain to GRSG in MZ I.

Grazing

Nature and Type of Effects. The remaining sagebrush habitats in MZ1 are mostly managed as grazing lands for domestic livestock. Domestic livestock function similarly to the native keystone species bison in the MZ through grazing and management actions related to grazing, by serving as the predominant large herbivore in the ecosystem. Grazing actions do not preclude wildlife and vegetation, but they do influence ecological pathways and species persistence (Bock et al. 1993).

In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. Changes in plant composition could also 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. Improper cattle and sheep grazing can also 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). Excessive 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. Excessive grazing can eliminate perennial grasses and lead to expansion of invasive species such as cheatgrass or Japanese brome (Reisner et al. 2013). The degree to which grazing affects habitat depends on several factors, such as the types of grasses being grazed, the amount of moisture in any given year, the number of animals grazing in an area, the time 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).

Much of the landscape in MZ I is adapted to withstand grazing disturbance, having been grazed by bison before the West was settled (Knick et al. 2011). Since the passage of the 1934 Taylor Grazing Act, range conditions on BLM-administered lands have generally improved due to improved grazing management practices, decreased livestock numbers, and decreased duration of grazing.

In addition, the BLM has applied Standards for Rangeland Health since 1997. The purpose of this practice 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.

Livestock grazing could reduce the suitability of breeding and brood-rearing habitat for GRSG populations (USFWS 2010). Reducing grass height in GRSG nesting and brood-rearing areas may negatively impact nesting success. Studies have showed such impacts when residual herbaceous cover was reduced below the approximately 7 inches needed for predator avoidance (Gregg et al. 1994, Doherty et al. 2014). However, grazing is only one component of grass height, which is also influenced by soil and weather conditions. 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.

Improperly designed or located 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 may rise in prevalence.

Allowing spring developments along ephemeral streams and wetlands 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 Planning Area and in MZ I. Livestock grazing is the dominant agricultural use in the Great Plains. It is widespread on many land ownerships, including federal and private, across MZ I. Remaining sagebrush habitats in MZ I are mostly managed as grazing lands for domestic livestock. Much of the landscape in MZ I is adapted to withstand grazing disturbance, having been grazed by bison before the West was settled. The effects of grazing on sagebrush habitats in this management zone are much different than effects noted in the Great Basin since the landscape throughout MZ1 is adapted to withstand grazing disturbance (Knick et al. 2011). Literature suggests that moderate grazing is compatible with GRSG habitat (Strand and Launchbaugh 2013); thus, closing acres to grazing may not itself benefit or harm GRSG, but the fences needed to separate BLM lands from other ownerships and close them to grazing would have direct impacts through increased mortality of GRSG. Possibly equally or more beneficial is restricting range improvements in GRSG habitat, limiting fencing, and effectively implementing range health standards on grazing allotments in GRSG habitat.

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.

In the LFO planning area, the BLM manages livestock grazing, primarily for cattle, on 230,700 acres in PHMA and 106,500 acres in GHMA, on 314 allotments in comprising nearly 70,000 AUMs in GRSG habitat (see **Chapter 3**).

Livestock grazing is not considered a substantial threat to GRSG in the LFO because grazing systems have been implemented on most allotments to provide for GRSG habitat needs throughout the year. Grazing in portions of the planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable between 2002 and 2012. Grazing on private lands within the planning area is expected to remain stable or slightly decrease as residential and recreational development increases.

Impact Analysis. **Table 5-8** lists the acres of PHMA and GHMA available and unavailable for grazing in MZ I, by alternative.

Table 5-8
Acres Available and Unavailable to Livestock Grazing in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Available to Livestock Grazing				
Alternative A	3,485,000	4	3,399,000	3
Alternative B	3,485,000	4	3,399,000	3
Alternative C	3,342,000	0<1	3,301,000	<1
Alternative D	3,485,000	4	3,399,000	3
Proposed Plan Amendment	3,573,000	7	3,407,000	3
Unavailable to Livestock Grazing				
Alternative A	3,000	0	8,000	0
Alternative B	3,000	0	8,000	0
Alternative C	236,000	99	119,000	94
Alternative D	3,000	0	8,000	0
Proposed Plan Amendment	3,000	0	8,000	0

Source: BLM 2015
This table displays the acres of PHMA and GHMA available and unavailable to livestock grazing in MZ I; it also displays the percentage of those acres that are found within the planning area.

Alternative A would implement land health assessments when completing grazing permit renewals to incorporate management changes when livestock grazing is a causal factor for not meeting standards on all lands. Under Alternatives B, and D and the Proposed Plan Amendment, acreage open to grazing and AUMs would remain the same as under Alternative A, but AMPs, integrated ranch planning, and land health assessments would be used to incorporate GRSG habitat objectives for LFO into grazing permit renewals. Using land health assessments, changes are made to permit conditions, including changes in condition, timing or season of grazing or reductions in grazing numbers, as needed to achieve land health standards. Management under Alternative C would remove livestock grazing from all allotments in PHMA and GHMA. Removing grazing could limit the loss of herbaceous cover, potential for trampling, and other effects on GRSG. However, removal of grazing could contribute to the occurrence of large-scale wildfire, and reduce noxious weed control efforts. In addition, no-grazing areas on BLM-administered land could require many miles of additional fencing to separate these areas from adjacent grazing lands, which would increase the adverse effects of fencing on GRSG, such as raptor predation, collision and habitat fragmentation.

The no-grazing areas on BLM-administered land would result in the most restrictive grazing conditions. This would benefit GRSG by maintaining nesting cover for protection and forage; however, closing acreage to grazing could result in fuels buildup or in increased fencing to exclude grazing animals, which could harm nesting GRSG by increasing the likelihood of predation and collision. In addition, it could increase indirect adverse effects on GRSG, including the potential conversion of adjacent private grazing lands to agriculture, if loss of federal grazing rights makes ranching less profitable.

In addition, because most grazed land in GRSG habitat in MZ I is privately owned, restrictions on grazing on BLM-administered land may have a limited direct effect on population areas. However, the construction of fences to enforce the closure of BLM-administered lands to grazing could have a substantial direct effect on GRSG survival. As literature suggests that moderate grazing is compatible with GRSG habitat (Strand and Launchbaugh 2013), closing acres to grazing may not benefit or harm GRSG. Possibly equally or more beneficial is restricting range improvements in GRSG habitat, limiting fencing, and effectively implementing range health standards on grazing allotments in GRSG habitat.

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. The NRCS's Sage-Grouse

Initiative is protecting privately held ranchlands for GRSG habitat using conservation easements. This program's influence across the MZ is expected to grow, but is currently limited compared to the total number of acres of GRSG habitat.

Although the acres closed to livestock grazing are similar under Alternatives A and the Proposed Plan Amendment, management and monitoring under the Proposed Plan Amendment would place greater emphasis on protective cover of vegetation and litter. The Proposed Plan Amendment also includes guidelines on placing salt or mineral supplements near leks, which would limit trampling damage to habitat, in accordance with the COT report objectives. In combination with NRCS actions under the Sage-Grouse Initiative, including fence marking and conservation easements, state efforts to maintain ranchland, and other past, present, and reasonably foreseeable future actions, BLM management actions in the Proposed Plan Amendment would provide a net conservation gain to GRSG.

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.

Conditions in the Planning Area and in MZ I. Human activity, such as surface disturbance, motorized transportation, and animal and human activity, increase the chance for establishment and spread of invasive plants via seeds carried by wind, humans, machinery, and animals. However, spread of invasive plants is less prevalent in MZ I and in the planning area due to its cooler, wetter climate. Drier, hotter summers promote the spread of cheatgrass and other invasives which establish more slowly in MZ I.

Although cheatgrass does occur, past fire history and research has repeatedly demonstrated a healthy northern mixed-grass prairie plant community is resilient to cheatgrass expansion. Haferkamp (2001) studying annual bromes, including cheatgrass in eastern Montana, concluded there would be no

ecological shift of northern mixed-grass prairies toward annual grass dominance. Instead, he concluded the amount and abundance of annual bromes occurring on Northern Great Plains rangeland is cyclic, depending on seedbank, temperature, amount and distribution of precipitation. Expansion of annual bromes in mixed–grass prairie communities is buffered by two long-lived perennial grasses (western wheatgrass and blue grama), where grazing management maintains healthy native mixed-grass prairie vegetation (Haferkamp 2001). Vermiere et al. (2011) studied effects of fire on perennial and annual grasses (including cheatgrass) and found increased production of western wheatgrass and decreased annual grass production following summer fire in the northern mixed-grass prairie. Climate Change research also suggests there would not be a cheatgrass invasion into the Northern Great Plains. Modeling illustrates the median precipitation change scenario (used to identify the most likely future climate change) depicts no increase in cheatgrass climatic habitat within the planning area (Bradley 2009).

The BLM currently manages weed infestations through integrated weed management: biological, chemical, mechanical, manual, and educational methods. It 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.

From 2002 to 2012, 17,437 acres of vegetation treatments were recorded in the planning area, including prescribed fire, weed control and mechanical treatments such as thinning, mastication, twist-spiking, and restoration of non-native fields. Future projects would continue these activities, including conifer removal activates to protect GRSG habitat.

Impact Analysis. Invasive species on BLM-administered lands would be controlled under all alternatives. Under Alternative A, the BLM would 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 is accomplished primarily through the implementation of Weed Control Cooperative Range Improvement Agreements with affected permittees/lessees. Weed control is intimately tied to protecting land from the threat of fire, and fuels management actions can also reduce weeds and create fire breaks.

The COT report objective for invasive species is to maintain and restore healthy native sagebrush plant communities. Under all alternatives, integrated vegetation management would be used to control, suppress, and eradicate noxious and invasive species to help restore native plant communities. Under Alternatives B, C, D, and the Proposed Plan Amendment, vegetation management and restoration would prioritize sagebrush re-establishment and

weed control as part of habitat management. Apart from the grazing reductions in Alternative C, methods, approaches, and resources for weed control would be similar under all alternatives.

The planning area is much different than the Great Basin, where most annual grass research and problems occurs. Although cheatgrass and other introduced brome occur in this region, they are typically not dominant and do not currently appear to pose a risk of large-scale invasion as long as management of habitat areas is maintained. Short-term, surface disturbing activities, overgrazing and drought can increase annual grasses. Proper management and typical precipitation patterns (wetter May and June, with nearly an inch of rain monthly through the fall) allows desirable native plants to remain, reestablish, and/or thrive in the presence of annual grasses.

Climate change is expected to increase temperatures in the area and annual precipitation is expected to increase during winter and spring, decrease slightly in summer and remain relatively unchanged in fall. Future conditions for annual grasses in the planning area are expected to be similar to existing conditions given the anticipated temperature and precipitation changes.

Projects subject to the general stipulations outlined in the Wyoming 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 by limiting the spread or establishment of invasive species, particularly on lands that lack BLM protective regulatory mechanisms.

These stipulations, in combination with other state and county noxious weed regulations, and other past, present and reasonably foreseeable future actions would provide a net conservation gain to GRSG in MZ I under all of the RMPA alternatives.

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 likely to exacerbate the effects of other naturally occurring and anthropogenic disturbances and could directly and indirectly increase the likelihood of certain disturbances on the landscape.

Conversion of native habitats to 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.

Biofuel production and high prices for small grains has increased the conversion to cropland of native grasslands or lands formerly enrolled in the Conservation Reserve Program. Converting native grasslands to agricultural lands not only resulted in a direct loss of habitats for native wildlife, it began a process of habitat fragmentation. Habitat loss is exacerbated when fragmentation reduces the size or isolates remaining habitat patches below the size thresholds necessary to support a species or when it blocks the movement of animals between habitat patches. GRSG have large spatial requirements and eventually disappear from landscapes that no longer contain large enough patches of habitat.

Surface-disturbing and disruptive activities allowed under Management Common to All Alternatives would contribute to impacts on wildlife habitat and likely result in some loss of habitat. The loss of sagebrush steppe across the western states approaches or even exceeds 50 percent in some areas, and is considered to be a primary factor in long-term declines in GRSG abundance across their historical range (USFWS 2010). Although sagebrush habitat losses in Montana may not have been as high as losses in other states, it has been significant enough in portions of the state to influence population trends (Walker et al. 2007). The best available information for Montana suggests breeding populations have declined by as much as 30 percent (USFWS 2010). It is predicted that this trend of sagebrush loss would continue under stressors such as urbanization and habitat conversion and result in habitat losses (although not to the same level as the past 50 years).

Conditions in the Planning Area and in MZ I. Across the Great Plains nearly 60 percent of native habitats have been lost to agricultural conversion (Samson et al. 2004) and conversion of sagebrush habitats is the most pervasive and extensive change to the sagebrush ecosystems in MZ I. Cropland currently covers nearly 19 percent of MZ I and influences approximately 50 to 80 percent of sagebrush in MZ I (Knick et al. 2011).

Regional assessments estimate that 7.2 percent of PHMA and GHMA in MZ I are directly affected by agricultural development, while over 99 percent of PHMA and GHMA in MZ I are within approximately 4 miles of agricultural land (Manier et al. 2013). Much of the direct habitat loss from conversion to agriculture has occurred in the northwestern and northeastern portions of MZ I, in Montana and the Dakotas (Knick et al. 2011).

According to the COT report, the Yellowstone watershed population in MZI faces a widespread threat of habitat loss due to agricultural conversion, and within the LFO planning area, this may be the most substantial threat to GRSG habitat. Habitat loss 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 spread of invasive plants.

Much of the direct habitat loss from conversion to agriculture has occurred in the far northwestern and northeastern portions of MZ I (Knick et al. 2011). Conversion to cropland has eliminated or fragmented sagebrush on private lands in areas with deep fertile soils or irrigation potential, and sagebrush remaining in these areas has been limited to agricultural edge or relatively unproductive environments.

An estimated 7.2 percent of priority habitat (PHMA) in MZ I has been influenced by agriculture (Manier et al. 2013). Conversion to agriculture is especially a concern in areas like LFO with a mosaic of ownership boundaries, which would decrease available habitat for GRSG that inhabit rangeland outside of BLM-administered lands. Temperature increases resulting from climate change may also increase crop yields, encouraging lands not previously used for agriculture to be converted for that purpose (NRC 2010).

Impact Analysis. The BLM does not convert public lands to agriculture; lands retained under BLM management would not be converted to agriculture. As such, the only direct authority the agency has over conversion to agriculture is through retaining or disposing of lands in the realty program. Disposing of lands could increase the likelihood they would be converted to agriculture, depending on their location and new management authority.

Table 5-9 shows acreages identified for retention in MZ I by alternative.

The table shows the same acreage would be identified for retention in Alternative D and the Proposed Plan Amendment. No alternative in LFO would dispose of land with important wildlife values.

Thus, BLM land tenure adjustments would not result in GRSG habitat in the planning area being converted to agriculture. Under all alternatives, land tenure adjustments require site-specific NEPA analysis and land sales must meet the disposal criteria under applicable law. BLM land tenure adjustments are not anticipated to be a significant contributing element to the threat of agriculture conversion.

Lands identified for disposal in MZ I 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 benefit GRSG.

Table 5-9
Acres Identified for Retention and Disposal in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Acres Identified for Retention				
Alternative A	3,339,000	0	3,167,000	0
Alternative B	3,339,000	0	3,167,000	0
Alternative C	3,339,000	0	3,167,000	0
Alternative D	3,572,000	7	3,279,000	3
Proposed Plan Amendment	3,572,000	7	3,279,000	3
Acres Identified for Disposal				
Alternative A	0	0	165,000	0
Alternative B	0	0	165,000	0
Alternative C	0	0	165,000	0
Alternative D	0	0	165,000	0
Proposed Plan Amendment	0	0	165,000	0

Source: BLM 2015
This table displays the acres of PHMA and GHMA identified for retention and disposal in MZ I; it also displays the percentage of those acres that are found within the planning area.

Under Alternative C, BLM would exclude grazing from GRSG habitat areas. This action would have the indirect effect of increasing grazing pressure on adjacent non-federal lands, and may also lead to conversion of adjacent private grazing lands to agriculture or other land uses, if the loss of federal grazing rights made ranching less profitable. This is especially a concern in areas such as Lewistown, with a mosaic of ownership boundaries, where GRSG populations rely on a mix of habitats susceptible to fragmentation and loss if private rangeland habitats are not sustained in concert with BLM-administered lands.

Studies of agricultural conversion risk on grasslands have shown a high probability of grassland plots being converted to cropland under current economic and climatic conditions (Rashford et al. 2013). The recent federal Farm Bill tried to discourage converting prairie to cropland by denying crop insurance for such conversions. Nevertheless, if crop prices remain high, the economic incentive to convert parcels to cropland in GRSG habitat areas would continue and would potentially increase. Once converted to cropland, acreage is permanently lost as habitat for GRSG. Fragmentation of habitat from piecemeal conversions of ranchland to tilled cropland can increase disturbance over a large area and cause adjacent areas to become unusable or poor-quality GRSG habitat.

The BLM has no management authority over private land conversions, but management actions on BLM lands may influence the potential for conversion on adjacent private lands (see grazing section above). The loss of habitat on private lands may reduce the effectiveness of conservation actions on adjacent BLM-administered lands because the effects of conversion extend onto adjacent lands and this effect increases as a greater percentage of a landscape is converted from sagebrush habitats to other land uses. Current levels of tillage result in localized impacts that alone, are unlikely to greatly impact a GRSG population, but acting in combination with other stressors, could result in localized extirpations (Taylor et al. 2010).

As a result, cumulative impacts vary relatively little across alternatives, and BLM 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 leases makes ranching economically unviable, the potential conversion of private grazing lands to agriculture would increase. However, the Proposed Plan Amendment does not substantially increase acreage unavailable to grazing.

Conversion to agriculture is a major concern in the eastern GRSG range in MZ I, the Dakotas, and Montana. In these areas agricultural conversion is profitable, and patchwork ownership boundaries increase the likelihood of habitat fragmentation. While BLM management may preserve habitat on federal lands, if interspersed private lands are tilled, the entire landscape may be lost as GRSG habitat regardless of BLM conservation actions.

In the future, temperature increases resulting from climate change may increase crop yields, encouraging lands not previously used for agriculture to be converted. Thus, the most protective grazing management the BLM can implement for GRSG habitat is to work to minimize habitat fragmentation and improve quality, by maintaining Rangeland Health Standards on current allotments and encouraging ranchers to maintain herds and adopt conservation enhancements.

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 2013). In accordance with this objective, the NRCS's SGI program focuses on maintaining ranchland that provides habitat for GRSG. As of 2014, SGI has secured conservation easements on 65,881 acres within MZ I and marked or removed 350 miles of fence (NRCS 2015).

This voluntary program provides private landowners with monetary incentives to protect GRSG habitat, often through altered grazing systems designed to increase grass height and improve nest success. Another more permanent

incentive that is used less often includes 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 lands with mixed ownerships to support GRSG. These efforts, in conjunction with BLM management and other past, present and reasonably foreseeable actions in MZ I, would provide a net conservation gain to GRSG in MZ I.

Fire

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. 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, fire has been identified as a primary factor associated with GRSG population declines, particularly in the Great Basin. 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. However, cheatgrass establishment after fires in MZ I is not currently a concern because resistance to widespread conversion to cheatgrass after fire is generally high throughout MZ I.

BLM management to prevent or control wildfires can also affect GRSG and habitat. Increased human activity and noise associated with fire suppression 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 Planning Area and in MZ I. Fire risk is generally low across MZ I compared to the Great Basin, with 17 percent of PHMA and GHMA having high risk for fire; however, isolated areas, especially in central Montana, South Dakota, the border between Montana and Wyoming, and eastern Wyoming are identified as having high fire risk (Manier et al. 2013).

There have been 324 wildfires documented on all lands within the LFO between 2002 and 2012. Wildfires have been widely distributed in terms of frequency and severity. An increasing trend of wildland fire recurrence and an increased

severity of drought conditions have been predicted for this area and are linked to climate change. These conditions are likely to continue, which could, in turn, increase the occurrence and severity of wildfires on BLM-administered land.

Impact Analysis. Management actions in the LFO RMPA that emphasize wildfire suppression in GRSG habitat would benefit the species by limiting habitat loss in the event of wildfire. Alternative D would continue the use of prescribed fire along with current management (Alternative A). Alternative B and C would restrict the use of prescribed fire in GRSG habitat, while the Proposed Plan Amendment would allow its use if it provided a benefit to 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 Montana executive orders emphasize fire suppression in Core population areas, 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.

The Interagency Standards for Fire and Fire Aviation Operations "Red Book" includes a BMP for GRSG habitat conservation for wildlife and fuels management (BLM 2013a). 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. The Proposed Plan Amendment would adhere to the COT report objective to retain and restore healthy native sagebrush plant communities within the range of GRSG. The coordination of federal, state, and local fire prevention actions and changes in fire management, in addition to other past, present and reasonably foreseeable actions in MZ I, would provide a net conservation gain to GRSG.

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 BLM Special Recreation Permit. 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). 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 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. However, access restriction will not eliminate other impacts, such as invasive plant spread, predator movements, cover loss, and erosion (Manier et al. 2013).

Conditions in the Planning Area and in MZ I. Historically low in the Great Plains, human population densities have increased 666 percent since 1920 (Knick et al. 2011). With expanding population comes greater human impacts (Leu et al. 2008), with many people moving to the Great Plains region because of access to public lands (Hansen et al. 2005).

Relatively few developed recreation sites are located in the planning area. The scattered distribution of BLM-administered land limits the extent of public recreation opportunities throughout the planning area. Big game hunting, fishing, dispersed camping, hiking, horseback riding, and target-shooting occur within the area. Recreation-based visitor use in the planning area is expected to continue at current levels or increase on BLM-administered and non-BLM-administered lands.

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 2013). Limits on road use under the action alternatives and limits on OHVs would help meet these objectives.

Cross-country motorized travel is not allowed on BLM-administered or National Forest lands in the planning area (BLM 2003), but in the absence of regional travel planning, this policy has not been rigorously enforced. Travel off of designated or existing routes as well as the creation of social trails has occurred and would likely continue to occur within the decision area.

In the LFO planning area, travel management planning is underway to determine specific routes available for closure.

Impact Analysis. **Table 5-10** shows Acres of Travel Management Designations in GRSG Habitat in MZ I.

Table 5-10
Acres of Travel Management Designations in GRSG Habitat in MZ I

	PHMA		GHMA	
	MZ I	***Percent Within Planning Area***	**MZ I**	***Percent Within Planning Area***
Open				
Alternative A	0	0	0	0
Alternative B	0	0	0	0
Alternative C	0	0	0	0
Alternative D	0	0	0	0
Proposed Plan Amendment	0	0	0	0
Limited				
Alternative A	3,563,000	7	3,394,000	3
Alternative B	3,563,000	7	3,394,000	3
Alternative C	3,563,000	7	3,394,000	3
Alternative D	3,563,000	7	3,394,000	3
Proposed Plan Amendment	3,563,000	7	3,394,000	3
Closed				
Alternative A	5,000	0	40,000	0
Alternative B	5,000	0	40,000	0
Alternative C	5,000	0	40,000	0
Alternative D	5,000	0	40,000	0
Proposed Plan Amendment	5,000	0	40,000	0

Source: BLM 2015
This table displays the acres of PHMA and GHMA within travel management designations of open, limited and closed in MZ I; it also displays the percentage of those acres that are found within the planning area.

Table 5-10, acres in MZ I indicates that under the LFO alternatives, acreage limited to existing routes would be the same under all alternatives. As a result of travel management planning, impacts on GRSG from motorized vehicle use would likely be greatest under Alternative A, and reduced under the action alternatives. Lek buffers applied under the Proposed Plan Amendment, and the anthropogenic disturbance cap would provide additional long-term protection for GRSG on BLM-administered land, and a disturbance cap would also apply across Wyoming and Montana, per the state plans. These caps would limit

future route development in GRSG habitat, helping reduce future impacts on GRSG on state and private lands.

Implementation of the Proposed Plan Amendment, in concert with travel management planning on BLM-administered lands within MZ I, the disturbance caps applied under state plans, and other past, present and reasonably foreseeable future actions, would help reduce the threats from recreation and travel on GRSG habitats and would provide a net conservation gain to GRSG in MZ I.

5.3.7 Conclusions

In addition to BLM management in the LFO planning area and other RMP planning areas in MZ I—North Dakota, South Dakota, Buffalo, Miles City, HiLine, and parts of Billings and WY—GRSG in MZ I would also be impacted by management and conservation at state, regional, tribal and local levels. This analysis takes into account each alternative in the LFO RMPA 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 RMP planning areas in MZ I.

Some of the most important past and present actions benefitting GRSG on private land in MZ I are the conservation easements coordinated by the NRCS SGI with private ranchers. SGI has so far preserved hundreds of thousands of acres of GRSG habitat in Wyoming and tens of thousands of acres in Montana. SGI 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 SGI is expected to provide further benefits to GRSG habitat. MFWP also makes agreements with ranchers to maintain sagebrush on private property. Ranchers are also beginning to use 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 would not be subject to additional regulations should the species become listed. While ranchers have used these agreements across GRSG range, thus far the agreements have been applied to only a small number of ranches in Wyoming and Montana. This coordination with private landowners enhances conservation in addition to what BLM management can accomplish on federal lands.

As discussed in **Section 5.1.4**, both Wyoming and Montana have adopted regulatory statewide plans to promote GRSG conservation. Wyoming's plan implements a Core Population Area Strategy with well density limitations, timing restrictions and a uniform 5 percent disturbance cap across all landownership types. These measures would improve GRSG population levels if effectively enforced (Copeland et al. 2013). The limitations on timing and density of energy development along with the disturbance cap, lek buffers and BLM management

on lands with federal mineral estate, would act in concert to promote GRSG conservation and reduce the impacts from energy development. Montana's plan, published in September 2014, promotes a statewide conservation strategy on private and state lands. It also calls for a 5 percent disturbance cap for GRSG habitat, limits well density, and imposes timing restrictions, similar to the approach in Wyoming. This combined management has the potential to act synergistically in enhancing protection for GRSG across state boundaries and on adjacent BLM-administered lands. In Montana, a five percent limit on anthropogenic disturbance is applied within the Density and Disturbance Calculation Tool examination area (based upon occupied leks within any given Core population area). North Dakota and South Dakota have non-regulatory plans in place to assist with GRSG conservation. These plans would not regulate activities permitted by the state, but these states contain smaller populations of GRSG on the edge of the range reducing the overall impact on GRSG in MZ I of not having state regulatory plans in the Dakotas.

Habitat restoration is also important for sustaining GRSG populations. For example, the Powder River Basin GRSG population has declined due to widespread energy development. The Powder River Basin Restoration Program envisions large-scale habitat restoration; as drill sites go out of production, they would be reclaimed and restored to pre-disturbance conditions. While not all restored habitat is successfully re-occupied by GRSG, the Powder River Basin Restoration Program anticipates that, as energy development ceases and locations are restored to habitat, GRSG in nearby habitats may recolonize restored areas successively. GRSG are not anticipated to return to the area in pre-disturbance numbers. However, restoration in areas next to Core habitat and extant populations and connectivity habitat would expand the available breeding and wintering habitat for GRSG and provide a net conservation gain to the species. It is not possible to accurately predict the impact of other local conservation plans in portions of MZ I that are voluntary in nature.

The COT report states that the Yellowstone Watershed population is at potential risk of extirpation from development of the vast energy resources in the region. Energy development acts in conjunction with other threats in MZ I, notably conversion to agriculture (tillage) and West Nile virus. West Nile virus heavily impacts GRSG and is particularly dangerous in populations already stressed by habitat fragmentation and loss (Taylor et al. 2010; USFWS 2013). The viability analysis for GRSG in the Miles City field office found that declines in populations when faced with combinations of these stressors were more rapid and less recoverable (Taylor et al. 2010). The population viability analysis for Powder River Basin reached similar conclusions (Taylor et al. 2012). However the viability analyses also noted habitat restoration opportunities, including the use of properly managed grazing as a tool to maintain viable GRSG habitat.

Because a majority of the GRSG habitats within MZ I are privately owned, current options for habitat conservation—for example, conservation easements and farm bill programs for private lands such as those directed by the NRCS Sage Grouse Initiative—are a viable option for effective conservation. Cover and productivity of native rangelands are essential for effective conservation of GRSG in this region. Naturally limited sagebrush cover coupled with historic agricultural uses and current energy production infrastructure make natural and induced habitat limitations a fundamental, limiting factor for local GRSG populations in this region (Manier et al. 2013).

As described in this analysis, the threat from energy development can be managed by coordinated action from BLM RMP amendments and revisions, and state actions, including disturbance caps to limit loss of GRSG habitat. BLM restrictions on energy development and associated infrastructure in GRSG habitat, and permit requirements for development of federal mineral estate, would help reduce loss and disturbance of GRSG populations. For lands that are already leased, BLM can apply COAs as provisions of drilling permit issuance or renewal to minimize impacts on GRSG habitat

The threat to GRSG in MZ I from conversion of private ranchlands to agriculture is particularly challenging. As described above, these conversions are attractive to ranchers as crop prices increase and climate conditions support more crops. Once tilled, GRSG habitat is not only lost on the tilled land, but surrounding habitat areas become fragmented and less hospitable to birds. Neither BLM management nor the state government can restrict tillage on private lands; it can only be influenced indirectly by promoting sustainable grazing and voluntary efforts for conservation, such as NRCS SGI program's conservation easements.

Alternative A: Current Management

Under Alternative A, current management would continue on BLM-administered lands. There would be no PHMA or GHMA established but management in important wildlife habitat would continue to protect GRSG. Additional ROW authorizations may not directly increase disturbance but could increase the activity or indirect effects on non-BLM-administered lands. Within MZ I as a whole, oil and gas development and associated infrastructure including ROWs would be harmful to populations in the Powder River Basin and the Dakotas, where energy resources are plentiful and GRSG at risk of decline from habitat loss and fragmentation (USFWS 2013). In LFO, existing restrictions on leasing fluid minerals in important wildlife habitat would continue to protect GRSG. Additional ROW authorizations may not directly increase disturbance but could increase the activity or indirect effects on non-BLM-administered lands. Within MZI as a whole, oil and gas development and associated infrastructure would be harmful to populations in the Powder River Basin and the Dakotas, where energy resources are plentiful and GRSG at risk of decline from habitat loss and fragmentation (USFWS 2013).

Grazing management would continue to promote rangeland health, and vegetation management would not prioritize sagebrush; however, current management, which does consider wildlife habitat value in decision-making, would continue, resulting in limited protection for GRSG through habitat management. Prescribed burns may reduce sagebrush habitat and fire suppression would not specifically protect these areas. Planned conifer encroachment reduction on BLM-administered lands would benefit GRSG under all the alternatives by improving habitat, and planned NRCS projects on private lands would improve cover and nesting habitat, and create beneficial range improvements.

In the rest of MZ I, other BLM RMP planning efforts would implement their Proposed Plans to improve protection of GRSG and their habitat. In addition GRSG conservation strategies would be implemented on state and private lands, including disturbance caps in Montana and Wyoming to reduce projects in GRSG habitat to a sustainable level. As a result, the lack of protections under the LFO RMPA Alternative A would be offset to an extent by more protective management elsewhere in MZ I. In the planning area, though, continuation of current management would do little to reduce the threats from mining, and infrastructure on GRSG wintering and breeding grounds. Current management provides a limited number and extent of regulatory mechanisms to avoid continued degradation of GRSG habitat in MZ I, but it would not meet the COT report objectives for conservation of GRSG.

Alternative B

Alternative B emphasizes protecting natural resources. Under Alternative B, PHMA would be exclusion and GHMA would be avoidance areas, and fires would be suppressed in sagebrush areas. Alternative B would site transmission lines in a location that minimizes impacts on GRSG, compared to Alternative A. These actions would benefit GRSG conservation on BLM-administered lands. Planned vegetation management, weed control, and restoration projects would also benefit BLM-administered lands in the planning area. These approaches would reduce the impacts on GRSG from energy development and associated infrastructure on BLM-administered land, and provide more protection to GRSG from land disposals that could lead to loss of habitat. Implementing protective measures on BLM-administered lands within the planning area would help preserve GRSG habitat, but risks pushing development onto adjacent lands with less restrictive management.

Several aspects of BLM management under Alternative B would benefit GRSG conservation at a landscape level, in conjunction with NRCS and state initiatives on private land. These include increasing lek buffers, imposing winter timing limitations and winter habitat restrictions, and protection of brood-rearing habitat. GRSG in MZ I would benefit most in states where nonfederal lands have similarly restrictive measures such as in Core areas in Wyoming and Montana. North and South Dakota do not have similar orders protecting GRSG on

nonfederal lands; thus, controls on BLM-administered land may not reduce overall impacts on GRSG.

Alternative B would meet the objectives laid out in the COT report for fire, invasive plants, range management, recreation, energy development, mining and infrastructure. Alternative B would minimize agricultural conversion by retaining lands providing GRSG habitat. It may result in more indirect impacts from potential conversions of private land providing GRSG habitat. However, this loss may be limited by the NRCS SGI program, which is helping landowners obtain conservation easements for ranchland providing GRSG habitat.

Alternative C

Under Alternative C, the BLM would provide more protection to GRSG on BLM-administered land but with reduced management flexibility. The alternative would identify both PHMA and GHMA as ROW exclusion areas, potentially pushing future transmission line construction onto non-BLM-administered land. Under Alternative C, the BLM would establish an ACEC on PHMA in MZ I, and development of leased fluid minerals would be restricted. Fires would be suppressed in sagebrush habitat and grazing would be removed in PHMA and GHMA. The vegetation management, weed control, and restoration projects described under this alternative would benefit GRSG habitat in at-risk areas such as the Dakotas, Belt Mountain, and the Powder River Basin.

Grazing would be removed in GRSG habitat areas under Alternative C, which would increase fine-fuel load. Though lessening over-grazing would reduce disturbance to GRSG, exclusion of livestock from BLM-administered land could require hundreds of miles of additional fencing, which would increase predation and collision risk, and contribute to fragmentation. It may also increase grazing pressure on adjacent private lands. Disturbance on lands adjacent to BLM-administered lands may indirectly impact GRSG populations on BLM-administered lands.

An additional indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for GRSG that inhabit rangeland outside of BLM-administered lands. Alternative C provisions would protect GRSG habitat from loss and fragmentation and limit human disturbance on BLM-administered land. However, due to the checkerboard pattern of land ownership in MZ I, these provisions could result in pushing developments onto non-BLM-administered lands, increasing impacts on GRSG over the long term.

Alternative C's management approach for GRSG in the planning area has more GRSG protections than current management (Alternative A). BLM actions in conjunction with NRCS and state plans would help to achieve COT report objectives for energy development, mining, recreation, and infrastructure. COT

objectives for range management, fire, invasive plants and conversion to agriculture might not be met within the planning area because of limitations on BLM's management tools. This could put GRSG populations in the Yellowstone Watershed at risk of further decline.

Alternative D

Under Alternative D, the BLM would improve GRSG habitat protection over current management, but with less restrictive actions than Alternatives B or C. The BLM would restrict leased fluid mineral development, similarly to Alternative B, and would establish ROW avoidance rather than exclusion areas. GRSG habitat objectives would be considered in grazing management in PHMA. Fires would be suppressed on sagebrush land, but prescribed burns may still be used. These provisions would protect GRSG on BLM-administered lands more than current management. The provisions would also maintain flexibility for land managers in areas with mixed public and private ownership, where ROW exclusion areas could result in more widespread development on private lands, and not reduce overall impacts on sagebrush habitat.

BLM actions would be in conjunction with NRCS and state initiatives on private land. These include increasing lek buffers, imposing winter timing limitations and winter habitat restrictions, and protection of brood-rearing habitat. GRSG in MZ I would benefit most in states where nonfederal lands have restrictive measures such as in Core areas in Wyoming and Montana. In states lacking disturbance limits on nonfederal land, conservation gains may be reduced.

Alternative D's management approach for GRSG is more protective than current management (Alternative A), but not as protective as Alternative B, C or the Proposed Plan Amendment. COT objectives for energy development, infrastructure, mining, range management, fire and invasive plants would likely be met in the planning area and in MZ I.

Proposed Plan Amendment

The Proposed Plan Amendment emphasizes sustainable development with moderate constraints on resource uses to protect GRSG and other natural resources. GRSG in SFA would receive the most protection. Priority habitat outside SFAs would also be protected by ROW avoidance and protective stipulations. BLM restrictions on ROWs and renewable energy in GRSG habitat would help reduce loss and disturbance of GRSG populations. The Proposed Plan Amendment includes 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, lek buffers, mitigation, and RDFs and BMPs.

Under the Proposed Plan Amendment, the BLM would improve GRSG habitat protection over current management. The Proposed Plan Amendment would increase protective buffers around leks and increase constraints on resource uses in GRSG priority habitat. It would impose a three percent disturbance cap

and use adaptive management, monitoring and mitigation to improve the effectiveness of GRSG protection over time. These provisions would protect GRSG more than current management and would complement protections on other lands. The Proposed Plan Amendment would maintain flexibility for land managers in areas with mixed public and private ownership. In such a case, strict restrictions on development on federal lands could result in more widespread development on private lands, without reducing overall impacts on sagebrush habitat. However, the population in the planning area is not stable or increasing due to prior disturbances, and it would be difficult for new management policies to offset these existing impacts over the 10-year analysis period.

The Proposed Plan Amendment would minimize agricultural conversion by retaining lands providing GRSG habitat and by working in conjunction with NRCS efforts to retain private ranchland providing GRSG habitat. However, converting private lands to agriculture would remain a risk to GRSG in MZ I under all alternatives.

In conjunction with state and regional planning efforts, implementation of disturbance caps, conservation easements on private lands, and implementation of the Proposed Plans for other BLM field offices in MZ I, and other past, present and reasonably foreseeable future actions, the Proposed Plan Amendment would best meet the objectives laid out in the COT report for energy, mining, fire, invasive plants, range management, recreation, and infrastructure.

Specifically, the following measures which would be implemented under the Proposed Plan, 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 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 oil and gas stipulations would limit development in PHMA and GHMA, except where pre-existing valid rights apply. In these areas COAs would limit disturbance.
- Implementation of state conservation plans and/or state executive orders would help meet COT report objectives 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 threats including energy, mining, and infrastructure.

- Removal of encroaching trees near occupied leks and important habitats (e.g., nesting, wintering, and brood-rearing) would reduce conifer incursion and help to maintain healthy native sagebrush plant communities.
- Continued implementation of the SGZI would help meet the COT objective for 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 livestock grazing and invasive plant species.

Summary

Overall, GRSG populations across MZ I face pressures from energy development, conversion to agriculture, and such stressors as disease, drought, and fire. These threats are magnified under the stress of habitat fragmentation and the isolation of small populations in the Dakotas, on the eastern edge of the species' range.

While implementation of the action alternatives would reduce threats faced by GRSG, overall trends toward habitat loss and fragmentation are likely to continue, primarily due to energy and infrastructure development pressures in GRSG habitat, notably in the Dakotas and Powder River Basin. The isolation of smaller populations makes them particularly vulnerable to disease and other stressors. The Yellowstone watershed population also faces habitat loss pressure from energy and infrastructure development, and fragmentation risk due to the low percentage of land in public management.

GRSG populations respond to a variety of stressors acting in concert. If BLM effectively restricted energy development infrastructure, but adjacent lands were disturbed through tillage, poor grazing practices, or other surface-disturbing activities, the effectiveness of BLM actions would be limited and decreases in GRSG populations in the planning area would be expected. Private lands being converted to cropland is a particularly worrisome threat in this region, because of the economic incentive of high crop prices and the patchwork pattern of landownership between federal and private lands. Widespread habitat fragmentation and degradation have already occurred in MZ I, GRSG would depend on a combination of Federal conservation actions, such as the removal of crop insurance protections for converted lands, and the NRCS SGI, state development restrictions and disturbance limits and private landowner actions to maintain viable habitat in PHMA and GHMA for the Yellowstone Watershed population. Alternatives B, D and the Proposed Plan Amendment would best promote these goals in the planning area. These alternatives would be most likely to stabilize GRSG populations throughout MZ I.

Reasonably foreseeable management efforts for control of energy development, mining, infrastructure, grazing, conversion to agriculture, fire, spread of weeds,

and recreation are projected to increase through increased coordination of federal, state, and local actions and the implementation of other BLM and Forest Service RMPs or amendments in MZ I. When the impacts of the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS are added to these actions, this would result in a net conservation gain to GRSG habitats and populations in MZ I.

Though small fringe populations may continue to decline across MZ I, implementing Alternative B, D or the Proposed Plan Amendment, in combination with the Proposed Plans for other field offices, development restrictions in the Wyoming and Montana state plans, increased land protections via the NRSC SGI, local and regional habitat restoration efforts, in conjunction with other past, present and reasonably foreseeable future actions, would conserve the region-wide population of GRSG in MZ I.

5.3.8 MZ-Wide Reasonably Foreseeable Future Actions Summary Table

Table 5-11 includes a selection of some of the larger projects from the reasonably foreseeable future actions tables in the RMPAs/LUPAs for MZ I. The full tables can be found in each EIS within the MZ.

Table 5-11
Reasonably Foreseeable Future Actions in Management Zone I 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						
I	Buffalo	Powder River Basin, Wyoming Basin	Greater Crossbow Oil and Gas Exploration and Development Project	Campbell and Converse Counties, Wyoming	Proposed development of 1,500 new oil and gas wells over 110,000 acres of split estate mixed surface ownership lands. There are no BLM surface lands within the proposed development area; however, approximately 62 percent of the mineral estate is managed by the BLM.[1]	Proposed
I	Wyoming Greater Sage-Grouse	Powder River Basin, Wyoming Basin	Converse County Oil and Gas	Converse County, Wyoming	Proposed development of up to 5,000 new oil and gas wells in northern Converse County, Wyoming. The proposed development area encompasses roughly 1.5 million acres of split estate mixed surface ownership lands, and includes all or parts of three different GRSG Core Areas.[2]	Proposed

Table 5-11
Reasonably Foreseeable Future Actions in Management Zone I Likely to Impact GRSG Habitat

MZ	Planning Area	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
I	Buffalo	Powder River Basin	Buffalo Oil and Gas Leases	Campbell, Johnson, Sheridan Counties, Wyoming	As of 2008, federal oil and gas leases covered approximately 2,533,975 acres in the Buffalo planning area.[3]	Ongoing
I	Miles City	Dakotas	Carter Master Leasing Plan (MLP)	Carter County, Montana	Proposed development of up to 119 oil and gas wells and associated infrastructure. 71 percent of oil and gas estate in MLP Area is comprised of federal mineral estate.[4]	Proposed
I	Miles City	Northern Montana, Yellowstone Watershed	Big Dry RMP Area	13 counties, northeast Montana	Surface coal leasing in the Fort Union Coal Region. 1,674,500 acres of high and moderate development potential (847,379 federal acres) in the RMP area.[5]	Ongoing
I	Miles City	Dakotas, Yellowstone Watershed, Powder River Basin	Surface coal leasing	Southeast Montana	Surface coal leasing in the Powder River Resource area. Lease proposals pending with the BLM comprise 2,242 acres and include the following mines: Spring Creek (1,772 acres), Rosebud (160) acres, Decker (310 acres).[3,6,7,8]	Ongoing and proposed
I	Buffalo	Powder River Basin	Powder River Basin Coal Mines	Campbell County, Wyoming	13 operating mines in planning area, and two proposed mines; all are surface coal mines, covering 162,336 federal acres in the Buffalo planning area[6]	Ongoing and proposed
I	Miles City	Dakotas	Pending Bentonite expansion	Carter County, Montana	Increase in permitted area by 2,050 acres, of which, 1,649 acres would be federal (BLM-administered) and 401 acres would represent private ownership[5]	Proposed
I	Buffalo	Powder River Basin	Black Hills Bentonite (Mayoworth Area Mine and Peterson Draw/Willow Creek-Posey Creek/Tisdale -Wall Creek Areas Mine)	Johnson County, Wyoming	Currently, there are 2 authorized active open-pit bentonite mines, 1 mine pending authorization, and 47 active bentonite mining claims in the Buffalo planning area on federal lands (both federal surface/federal minerals and split estate)[8]	Ongoing and proposed

Table 5-11
Reasonably Foreseeable Future Actions in Management Zone I Likely to Impact GRSG Habitat

MZ	Planning Area	GRSG Population(s) Affected	Project Name	Project Location	Project Description, Estimated Footprint	Project Status
I	Buffalo	Powder River Basin	Nichols Ranch/Hank Unit Uranium in-situ Recovery Mining Project	Johnson County, and Campbell County, Wyoming	Pending authorization for a proposed 2,250-acre in-situ uranium recover mine, which includes 303 acres of BLM-administered surface lands. Seven occupied leks occur within 2 miles of the Hank Unit.[9]	Proposed
I	HiLine, Lewistown, Billings, Miles City, North Dakota, South Dakota	Northern Montana, Yellowstone Watershed, Belt Mountains, Powder River Basin, Dakotas	WAPA Upper Great Plains Wind Energy Programmatic EIS	Montana, North and South Dakota, other Great Plains states	Programmatic EIS will identify environmental impacts, mitigation strategies, and review procedures for future wind-energy proposals in the upper great plains region[10]	Proposed
Rights-of-Way						
I	HiLine, Miles City, South Dakota	Northern Montana, Yellowstone Watershed, Dakotas	Keystone XL Pipeline	Montana, South Dakota, other states	285-mile ROW in Montana and South Dakota, of which 45 miles may occur on BLM-administered lands[11]	Proposed
I	Miles City	Yellowstone Watershed	Tongue River Railroad Project	Colstrip to Decker, Montana	Construction and operation of a 42-mile railroad between Miles City and Colstrip, Montana[12]	Proposed

1. Greater Crossbow Oil and Gas EIS: http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA.Par.24843.File.dat/hot_sheet.pdf
2. Convers County Oil and Gas Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/cfo/Converse_County_Oil_and_Gas.html
3. Buffalo Oil and Gas Leases: http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo/docs.html
4. Carter Master Leasing Plan – Miles City RFD. Minerals Appendix of DEIS. P. MIN-164-165: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp/draft_rmp.html
5. Miles City RFD, Minerals Appendix of DEIS. P. MIN-165-173: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp/draft_rmp.html
6. Powder River RMP Area – Miles City RFD, Minerals Appendix of DEIS. P. MIN-173-188, and Powder River Resource Area RMP (BLM 1984) (http://www.blm.gov/mt/st/en/prog/planning/powder_river.html)
7. Spring Creek, Rosebud, Decker Mines – Miles City RFD, Minerals Appendix of DEIS. P. MIN-192
8. Buffalo Revised Final Mineral Report: http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/planning/rmps/buffalo/docs.Par.90169.File.dat/RevisedFinalMineralReport_Part1.pdf.
9. Nichols Ranch/Hank Unit Uranium in-situ Recovery Mining Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/bfo/nichols-ranch.html
10. Upper Great Plains Wind Energy PEIS: http://plainswindeis.anl.gov/documents/dpeis/index.cfm.
11. Keystone XL Pipeline: http://keystonepipeline-xl.state.gov/finalseis/index.htm
12. Tongue River Railroad EIS: http://www.tonguerivereis.com

5.4 LANDS AND REALTY

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 the lands and realty programs are lands and realty actions, including foreseeable demand for renewable energy ROWs in response to national and international policies to mitigate climate change.

Land use authorizations in the planning area place the largest demand on the BLM lands and realty program and result in the greatest impacts. Between 2008 and 2012, the BLM issued ROW authorizations that resulted in an average of 10 ROW actions per year. Past authorizations were primarily for linear features, such as roads, power lines, and telecommunication lines. In 2013, the BLM processed three road ROW applications in the planning area; two in Fergus County and one in Petroleum County (see **Table 5-1**). BLM also processed two power lines (one in Choteau County and one in Petroleum County) and two telecommunication lines (both in Fergus County). The BLM has also issued three temporary use permits in 2013 for filming. Under all alternatives, a steadily increasing demand for ROWs to accommodate new power, water, and telecommunication lines; roadways; communication sites; and other similar development is expected. Any BLM management prescriptions that limit the BLM's ability to accommodate ROW development would influence the level of cumulative impacts on lands and realty and could potentially increase development on non-BLM-administered land.

Land tenure adjustments allow the BLM to effectively manage BLM-administered lands over time. Withdrawals, for example, are used to preserve sensitive environmental values, protect major federal investments in facilities, support national security, and provide for public health and safety. Exchanges may consolidate BLM-administered lands and improve management efficiency. Management prescriptions that limit land tenure adjustments could result in cumulative impacts on lands and realty and other resources and uses.

Under Alternative A, the BLM would continue to authorize ROW development and temporary surface disturbance on a case-by-case basis. The Acid Shale-Pine Forest ACEC in PHMA and the portion of Judith River Canyon area in GHMA would continue to be the only ROW avoidance areas. Land tenure adjustments would be subject to current RMP criteria without further limitations. As a result, cumulative impacts on lands and realty would occur as new ROWs or land tenure adjustments are proposed. Alternative A would not affect the BLM's ability to accommodate new ROW development to improve management efficiency through land tenure decisions.

Under Alternatives B, C, D, and the Proposed Plan Amendment, BLM management would include varying levels of ROW restrictions. Designations of areas as ROW avoidance or exclusion would neither impact existing ROW authorizations, nor ROW applications already being processed. The restrictions

would, however, impact future ROW development. Alternative C would result in the greatest restriction on ROW development by designating PHMA and GHMA as a ROW exclusion area. Alternative B would prohibit ROW development in PHMA, while Alternative D would designate PHMA as ROW avoidance area. The Proposed Plan Amendment would avoid major ROWs in GRSG habitat; minor ROWs would continue to be allowed in GHMA. A prohibition on ROW development over a large area would prevent the BLM from accommodating the demand for new ROWs. Potential ROW applicants could choose to develop on non-BLM-administered land outside the planning area, which could increase environmental impacts on sensitive lands, increase permitting times, and decrease the overall effectiveness of the infrastructure system (e.g., power grid, telecommunication system, and roadway network).

National policies to mitigate climate change through the expansion of renewable energy production could also contribute direct and indirect long-term cumulative impacts on the lands and realty program in the planning area. There are 62,916 acres of viable wind resource areas (i.e., areas where the wind energy potential is greater than or equal to 400 watts per square meter) in the planning area, including nearly 7,000 acres of excellent (500 to 600 watts per square meter) or outstanding (greater than 600 watts per square meter) wind energy resource potential (BLM 2012a). As demand for renewable energy sources increases at the same time as wind energy technology, requests for ROWs to accommodate wind energy within the planning area are expected to increase. Wind energy development adjacent to BLM-administered lands would increase demand for transmission lines through the planning area. Any restrictions on ROW development would directly impact the lands and realty program, indirectly impact wind energy development in Montana, and when combined with other ROW demands, result in additional cumulative impacts on the BLM lands and realty program. The potential for future ROW infrastructure to support new wind energy ROW development in the planning area would be the least under Alternative C, which would exclude all ROW development, including wind energy ROWs in GRSG habitat. The Proposed Plan Amendment, which would exclude wind energy development in PHMA, would decrease future demand for associated ROWs to support that development. Overall, Alternatives B, C, D, and the Proposed Plan Amendment would eliminate or discourage wind energy ROWs in GRSG habitat and promote future development in areas with good wind resource potential outside GRSG habitat. New ROW development would be more likely in GHMA or in areas outside of GRSG habitat with a cumulative decrease in demand for ROWs through the planning area, particularly for Alternative C and the Proposed Plan Amendment.

5.5 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 would likely to continue to affect vegetation are vegetation management, noxious weed control, livestock grazing, energy development, and wildfire management.

Sagebrush-promoting vegetation treatments would protect native 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 remove or prevent encroachment of shrubs, non-native 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 reduces wildland fire frequency by suppressing natural ignitions, the indirect impact is that vegetation ages across the landscape and early successional vegetation communities are diminished. Fire suppression may preserve condition of some vegetation communities as well as habitat connectivity. This is particularly important in areas where fire frequency has increased as a result 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 aspects 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). Properly managed, grazing can be used as a tool to reduce fuel load, reduce spread of noxious weeds, and protect intact sagebrush habitat (Connelly et al. 2004, p.7 and pp. 28-30). In areas meeting Rangeland Health Standards, grazing practices co-exist 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.

Oil and gas energy development impacts sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors; 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).

Under Alternative A, current management would continue on BLM-administered lands in the planning area. There would be no PHMA or GHMA designated, no new ROW avoidance or exclusion areas established, and no restrictions on leased fluid mineral estate to protect GRSG habitat. Grazing management would not specifically consider GRSG habitat needs, and vegetation management would not prioritize sagebrush. Current management does consider wildlife habitat value in decision-making. Planned ROW construction could increase fragmentation of vegetation, and new oil and gas developments would increase loss of sagebrush vegetation, particularly in the Powder River Basin and the Dakotas, where energy resources are plentiful in sagebrush habitat (USFWS 2013, pp. 63-65). Vegetation management and noxious weed control projects would benefit sagebrush ecosystems by removing invasive plants and promoting healthy vegetation communities. Weed control efforts would continue to be driven by Weed Control Cooperative Range Improvement Agreements with affected permittees/lessees. Prescribed fire plans could be harmful to sagebrush, which are slow to re-grow.

Energy development and ROW construction impacts sagebrush habitats through direct disturbance and vegetation loss from well pads and associated infrastructure, including access roads, power lines, and pipeline corridors; and vehicle use. The interaction and intensity of effects could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005). Staging areas, roads, ROWs, and other infrastructure also disturb vegetation and contribute to the risk of wildfire and introduction of

noxious weeds. These trends would likely continue and increase given the energy and infrastructure development pressure in the planning area and the lack of specific management tools to mitigate them under Alternative A.

Under Alternative B, PHMA and GHMA would be designated and ROW exclusion and avoidance areas respectively. Grazing management would be improved. No ACECs would be established, but land disposals and acquisitions would focus on maintaining sagebrush acreage and connectivity. Future ROWs, access roads and associated infrastructure, as described in **Table 5-1**, would be sited outside PHMA under Alternatives B and C, and avoided in Alternative D and the Proposed Plan Amendment. Under Alternatives B and C, the ROW exclusion areas could push ROW development onto private lands that contain sagebrush and other vegetation types. The vegetation management and restoration projects mentioned above would benefit the planning area in discrete locations. Prescribed fires would be re-seeded and monitored to prevent invasive plants from establishing. Overall, the trend toward loss of sagebrush habitat would continue from infrastructure and energy, but restrictions on lands retained as PHMA and improvements on ranchlands in the planning area would improve habitat quality on remaining sagebrush acreage.

Alternative C would provide more protection to GRSG habitat on BLM-administered land but would reduce management flexibility. Alternative C would establish an ACEC in PHMA, and PHMA and GHMA would be ROW exclusion areas. These provisions would protect vegetation from loss, fragmentation, and disturbance. However, as described above, the ROW exclusion areas could push ROW development onto private lands that contain sagebrush. Grazing would be removed from PHMA and GHMA, which would allow for greater herbaceous growth but would increase fuel loading and risk of wildfire, and potentially degrade vegetation quality over the long term. An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease sagebrush and other vegetation outside of BLM-administered lands. As under the other alternatives, the vegetation management and weed prevention projects would benefit vegetation health. Alternative C would impose the most stringent restrictions on development of GRSG habitat, losing the benefits that properly managed grazing can provide, and preventing management flexibility in areas of checkerboard private and public landownership.

Alternative D and the Proposed Plan Amendment are intended to preserve management flexibility while protecting GRSG habitat. Both would improve vegetation protection compared to current management but with less limited actions than Alternatives B or C. Alternative D would establish ROW avoidance areas but not ROW exclusion areas, while the Proposed Plan Amendment would also establish ROW avoidance areas but not ROW exclusion areas, more

ROW avoidance in GHMA would be proposed. The Proposed Plan Amendment would also designate wind and solar ROW exclusion areas. Prescribed burning and fuels management would take sagebrush vegetation into account. These provisions would maintain flexibility for land managers in areas with mixed public and private ownership, such as in the Yellowstone watershed area, where ROW exclusion areas could result in more widespread development on private lands, and not reduce overall impacts on sagebrush ecosystems.

Vegetation management and weed control plans would benefit vegetation health. Weed control efforts would continue to be driven by Weed Control Cooperative Range Improvement Agreements with affected permittees/lessees. Development restrictions on PHMA and GHMA, and ranch improvements would improve vegetation quality on sagebrush acreage, though overall, the trend toward loss of sagebrush would continue from energy and infrastructure development.

In addition to establishing protective land use allocations, the Proposed Plan Amendment would implement a suite of management tools such as disturbance limits, GRSG habitat objectives, mitigation strategy, lek buffer-distances, and adaptive management throughout the range. These overlapping and reinforcing conservation measures would work in concert to improve GRSG habitat condition and would contribute to the overall improvement of vegetation conditions.

5.6 WILDLAND FIRE MANAGEMENT AND ECOLOGY

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect wildland fire management and ecology are: vegetation management projects, projects that impact ability to respond to wildland fire, projects that would increase ROW authorizations and energy and mineral development, and projects that would increase access to land and consequently increase the risk of human-caused ignitions.

Wildland fires in the LFO has been frequent in the past, with 324 wildfires documented between 2002 and 2012. Of those 324 wildfires, 40,782 acres burned were attributed to human-caused fires, and 91,702 acres were attributed to naturally occurring fires. Wildland fires are expected to increase in the future due to reoccurring and increasingly severe drought conditions that are caused by climate change. This could impact wildland fire management through increased personnel requirements, and increased need for fire-suppression activities, and increased costs to the wildland fire management program. Under Alternative C, which is the most restrictive alternative, this could present challenges as the restrictions under this alternative may inhibit responses to wildland fire or appropriate treatments to prevent wildland fire. Due to the ongoing revision of planning area RMPs, there is the possibility that

planning decisions would result in changes in fuels level or changes to management option for fuels treatments and wildfire suppression.

Drought may affect forest health, which consequently makes forests more vulnerable to wildland fires. Additionally, attacks by insects such as the mountain pine beetle damages forest health and has been enabled by stress on forests caused by drought. 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.

Past fuels treatments within the planning area, including hazardous fuels reduction, prescribed fires, chemical and mechanical treatment, and seeding, would likely continue and potentially increase in the future. Approximately 1,000 acres of crested wheatgrass restoration, clubmoss, and mechanical treatments, as well as 129,000 acres of prescribed fire and maintenance burning, have been proposed and may be implemented within the foreseeable future. Also 1,300 acres of conifer removal was approved in 2014, with additional acres planned annually. These plans could decrease the intensity and occurrence of wildland fires. It could also return some of the vegetative communities to healthier states, which would result in an indirect decrease in risk of wildland fire.

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. An average of 10 ROW actions are authorized a year in the planning area (see **Table 5-1**). The development allowed under these authorizations would result in surface-disturbance, which would generally contribute to the modification of the composition and structure of vegetation communities in the vicinity of developed areas, which could then be more likely to fuel high-intensity fires. Additionally, decisions on seven land actions are still pending and would have the potential to increase the risk of wildland fire and consequently, increase the burden on wildland fire management in the future.

Management under all alternatives and the Proposed Plan Amendment would place more restrictions on land uses that may introduce new sources of ignition and increase the risk of human-caused ignitions. Therefore, although some of these restrictions may restrict the ability of the wildland fire management program to suppress and preventatively treat fires, other restrictions, such as restrictions on types of recreation, may also lessen the occurrence of fires and may result in fewer fires in the future.

Minerals development under all alternatives would have similar impacts due to the lack of solid mineral potential in the area. Oil and gas leases requiring special wildlife stipulations in the LFO have been deferred in order to protect important wildlife habitat. This deferral indirectly effects wildland fire by

reducing risks for wildland fire in the LFO because leases would not be offered within the planning area in the foreseeable future.

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. 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.

5.7 FLUID MINERALS

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 fluid minerals are development of and exploration for fluid minerals on mineral estate that is not owned by the federal government. This exploration and development must be considered in combination with exploration and development on federal mineral estate to assess the cumulative impacts of this RMPA/EIS. However, as discussed in **Section 1.3**, there is an existing protest resolution decision affecting lands managed within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PH and GH, or PHMA and GHMA. Existing fluid mineral leases within GRSG habitat that expire can be renominated for leasing but would be deferred as described above. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, new oil and gas leasing will not be addressed in this RMPA/EIS.

5.8 SOLID MINERALS (SOLID LEASABLE MINERALS)

The BLM has not identified any past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that are likely to affect solid leasable minerals (see **Table 5-1**). Therefore, cumulative impacts on solid leasable minerals are not anticipated. Refer to **Section 4.8**, Solid Leasable Minerals, for the direct and indirect impacts.

5.9 SOLID MINERALS (LOCATABLE MINERALS)

The BLM has not identified any past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that are likely to affect solid locatable minerals (see **Table 5-1**). Therefore, cumulative impacts on solid locatable minerals are not anticipated. Refer to **Section 4.9**, for the direct and indirect impacts.

5.10 SOLID MINERALS (SALABLE MINERALS)

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue

to affect salable minerals are development of salable minerals on mineral estate that is not owned by the federal government. This development must be considered in combination with development on federal mineral estate to assess the cumulative impacts of this RMPA/EIS. The management actions proposed under this RMPA/EIS would cumulatively impact salable mineral development through closures and surface use restrictions that ultimately would decrease the amount of salable mineral development in the planning area during the planning period.

As economic conditions improve, salable mineral extraction and use is expected to increase to support nearby development, specifically road building and maintenance. The proximity of both transportation and markets are key elements of a deposit. As the amount of federal mineral estate available for disposition of salable minerals is reduced, demand for salable minerals would increase in other areas. Salable minerals may have to be extracted from locations further removed from construction projects to avoid restricted federal mineral estate. This effect would be strongest under Alternative C because 42 percent of the federal mineral estate in the planning area (5 percent of the total planning area regardless of mineral ownership) would be closed to the disposition of salable minerals. Management under Alternative B and the Proposed Plan Amendment would close 34 percent of the federal mineral estate in the planning area (4 percent of the total planning area regardless of mineral ownership). However, exceptions under the Proposed Plan Amendment would allow for some development to occur within closed areas. Under Alternatives A and D, less than one percent of the federal mineral estate in the planning area (less than one percent of the total planning area regardless of mineral ownership) would remain closed to the disposition of salable minerals, making these alternatives the least restrictive to extraction and use of salable minerals.

Restrictions on ROW development (e.g., ROW exclusion and avoidance areas) would likely reduce the demand for salable minerals needed for construction and maintenance in the planning area. ROWs are prohibited in exclusion areas and intended to be avoided in ROW avoidance areas. As such, it is likely that salable mineral demand in these areas would also decrease because fewer roads require less salable minerals. Zero acres would be managed as ROW exclusion or avoidance areas under Alternative A, providing the most opportunity for ROW development and, therefore, greatest demand for salable minerals. Under Alternatives B and C and the Proposed Plan Amendment, the BLM would manage 345,560 acres (5 percent of the total planning area regardless of surface ownership) as ROW exclusion or avoidance area. Under Alternative C, this acreage would be entirely exclusion area, while Alternative B and the Proposed Plan Amendment would have more avoidance area. Under Alternative D, 233,219 acres (3 percent of the total planning area regardless of surface ownership) would be managed as ROW avoidance area.

5.11 COMPREHENSIVE TRAVEL AND TRANSPORTATION MANAGEMENT

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect CTTM include the BLM Off-Highway Vehicle Final Environmental Impact Statement and Proposed Plan Amendment Record of Decision (BLM 2003b), which limits year-round motorized wheeled travel to existing roads and trails. BLM management would continue to limit motorized wheeled travel to existing roads and trails under all alternatives. There would be no additional cumulative impacts from closures of existing routes.

Under all alternatives, unauthorized cross-country motorized travel would continue to impact CTTM. Cumulative impacts from cross-country travel include the creation of un-authorized travel routes and the need for additional management, such as enforcement, signage, and education. Unauthorized travel could result in seasonal or permanent closures of areas or designated routes. The BLM would evaluate the need for closures as part of an implementation-level travel management planning process. Under Alternatives B, C, D, and the Proposed Plan Amendment, the BLM would conduct the travel management planning process within five years of the current RMPA process.

Under Alternative C, the BLM would prohibit un-authorized road construction in PHMA within four miles of a lek. Cumulative impacts on CTTM as a result of this limitation could include congestion on the existing travel route network within and adjacent to the planning area, particularly where routes provide access to multiple resource uses. Congestion and burden would prevent access and require more active management (e.g., enforcement, signage, and education) by the BLM.

5.12 RECREATION

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 recreation are activities that conflict with recreation activities and opportunities, particularly hunting. These include mineral development; numerous land use authorizations, including 11 in 2013; grazing and range improvements, including five different range improvement projects between 2002 and 2012; travel management; and climate change.

Within the planning area, the BLM anticipates a steady demand for rural recreation experiences that are far from urban areas. Hunting, hiking, fishing, and sight-seeing have and would continue to be the area's most popular recreation activities. As activity associated with other resource uses (e.g., mineral development, lands and realty, and livestock grazing) remains steady or increases, the potential for conflicts and subsequent cumulative impacts on recreation would persist.

Fluid mineral development of existing leases would continue to impact recreation in the planning area. For all alternatives, long-term disturbance in the

planning area from oil and gas activity would be a minimum of 55,880 acres. While the BLM anticipates oil and gas activity on existing leases to remain steady in most areas, cumulative impacts are possible from new drilling and production in southern Petroleum County. Fluid mineral activity impacts popular recreation activities such as big game hunting, wildlife viewing, and hiking by creating noise, dust, vehicle traffic, and night lighting.

Existing, proposed, and foreseeable ROW development in the planning area would also result in cumulative impacts on recreation activities and opportunities. In addition to the 215 miles of existing ROW actions throughout the planning area, the BLM processed three road ROW applications in the planning area; two in Fergus County and one in Petroleum County (see **Table 5-1**). BLM also processed two power lines (one in Choteau County and one in Petroleum County) and two telecommunication lines (both in Fergus County). The BLM also anticipates additional long-term cumulative impacts from future ROWs, possibly those accommodating wind energy development, telecommunication infrastructure, and roadways. ROW development conflicts with recreation activities, particularly big game hunting, by creating linear obstructions for game and hunters. Cumulative impacts from existing and ongoing ROW development also reduce the quality of the rural outdoor experience sought by recreation users in planning area.

Under Alternative A, the BLM would continue to allow ROWs, mineral development, and grazing throughout the planning area with the result of continued cumulative impacts on recreation activities and opportunities. Management under Alternatives B, C, D, and the Proposed Plan Amendment 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 recreation. Compared to the other alternatives, management under Alternative C would result in the least amount of cumulative impacts on recreation due to proposed management prescriptions that include the identification of PHMA as ROW exclusion area, removal of livestock grazing in GRSG habitat, designation of a new ACEC, and application of COAs on existing fluid mineral leases in PHMA and GHMA. The requirement for recreation facilities under the Proposed Plan Amendment to achieve net conservation gain to GRSG habitat could result in modifications of future projects or in those projects being located outside of PHMA. Where net conservation gain could not be achieved, there could be a reduction in the number of recreation facilities in PHMA.

Under all alternatives and the Proposed Plan Amendment, the BLM anticipates long-term cumulative impacts from travel management and climate change. Unauthorized motorized cross-country travel and the creation of new roads and trails are and would continue to impact non-motorized recreation opportunities. At the same time, climate change could alter big game habitats, impact water resources for fishing, and increase the threat of wildfire. Increased

concern over both areas could result in further management actions to mitigate adverse effects. Additional regulations would result in cumulative impacts (e.g., travel closures or restrictions on SRPs for certain activities), which may reduce recreation opportunities, resulting in further impacts.

5.13 RANGE MANAGEMENT

Past, present, and future actions within the cumulative impact analysis area that have affected and would likely continue to affect livestock grazing 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. Grazing in portions of the planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable between 2002 and 2012. Grazing on private lands within the planning area is generally expected to remain stable or slightly decrease as residential and recreational development increases. These trends are expected to continue.

Past and present actions that have affected livestock grazing include human-caused surface disturbances such as those associated with mineral development, recreation, prescribed burning, and historic grazing practices. Drought and water availability in the planning has a significant impact on livestock grazing. Drought and the associated 324 wildland fires that have occurred in the planning areas since 2000 have contributed to current ecological conditions by impacting the level of forage available and ability of lessees/permittees to fully utilize permitted levels of AUMs. 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. Cumulative projects that increase human disturbance in grazing areas could also indirectly impact grazing by increasing weeds and invasive species and by disturbing or displacing livestock.

The contribution of the RMPA/EIS to cumulative impacts would parallel the impacts of the alternatives as described in **Chapter 4**. The greatest contribution to cumulative effects on livestock grazing would be seen under Alternative C due to the reduction of grazing in the planning area. The reduction of grazing on BLM-administrated lands could impact area lessees/permittees economically and may put additional pressure on forage resources on private lands in the area.

Approximately 3,400 additional miles of fencing could be required to exclude livestock from BLM-administered lands where grazing is excluded, representing potential additional costs to private landowners. Lessees and permittees would be faced with reducing AUMs for their operations or locating replacement forage, often at higher costs than that currently obtained from BLM-administered lands, with potential impacts on individual leases/permits as well as

the local community. Closures would also impact ability of lessees and permittees current seasonal rotations or other management strategies that utilize both public and private lands.

Additionally, many permittees and lessees may try to increase forage production on their private and other leased land. This would accelerate the conversion of private native range (GRSG habitat) to agricultural and introduced grass production. Also, ranchers may spray or burn big sagebrush on native range in an effort to increase forage production on private lands to replace the lost BLM forage, potentially degrading the quality of GRSG habitat.

5.14 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect ACECs are any actions impacting the relevant and important values for which the ACECs were established. Such actions include ROW development, oil and gas production, livestock grazing and range improvements, travel management, and climate change.

Currently, the Acid Shale-Pine Forest ACEC is the only ACEC in the planning area that falls within GRSG habitat. Under Alternative C, the BLM would designate a GRSG ACEC as a way to prioritize BLM management of PHMA.

Livestock grazing, while allowed within the Acid Shale-Pine Forest ACEC boundary, is steadily declining in the region due to drought and the increasing use of land for residential and recreational uses. Combined with the unstable shale soils and lack of forage, the Acid Shale-Pine Forest ACEC has been and would continue to be less attractive to grazing when compared to adjacent grasslands. Long-term cumulative impacts from removing livestock grazing could occur within the new GRSG ACEC proposed under Alternative C. The removal of grazing could support the relevant and important values of the proposed GRSG ACEC.

Unauthorized cross-country motorized travel is expected to continue throughout the decision area with cumulative impacts possible within the Acid Shale-Pine Forest ACEC. The creation of un-authorized trails and primitive roads would result in cumulative impacts on the Acid Shale-Pine Forest ACEC under Alternatives A, B, and D, the Proposed Plan Amendment, and the GRSG ACEC proposed under Alternative C. Cumulative impacts on the respective ACEC values from unauthorized motorized cross-country travel would include soil compaction and subsequent impacts on the Pine Forest and sage-brush vegetation communities.

Under all alternatives and the Proposed Plan Amendment, climate change would pose a long-term threat of cumulative impacts on the relevant and important values of the Acid Shale-Pine Forest ACEC and the GRSG ACEC proposed under Alternative C. Cumulative impacts on GRSG habitat and,

consequently, on the ACEC from climate change could include vegetation regime changes (e.g., from sagebrush to grasslands) and increased wildfire potential due to drought (Connelly et al. 2004).

5.15 AIR RESOURCES

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect air quality are actions related to solid salable minerals development and wildfire (climate change).

Salable minerals include deposits such as granite that are used for road building and maintenance. Salable mineral extraction and associated actions such as rock crushing are stationary sources of particulate emissions as well as criteria and hazardous pollutants emitted by equipment used to excavate and process the material. Use of these sites can result in elevated levels of fugitive dust both at the site and along haul routes between the extraction site and the construction site. The scale of mineral extraction depends on the demand for these materials, which is driven by the level of development in an area. Actions listed in **Table 5-1** that require development of roads or ROWs may increase the demand for salable minerals, resulting in increased particulate emissions in the planning area.

The management actions proposed in this RMPA/EIS under Alternatives B, C and the Proposed Plan Amendment would close many areas of BLM-administered lands to ROW developments, which would reduce the demand for salable materials. Air emissions associated with development on BLM-administered lands would likely be reduced compared with current conditions, and proposed BLM management actions would have no incremental cumulative air quality impact.

Under Alternatives A and D, less than 3,000 acres would be closed to salable mineral development, and emissions associated with material excavation and processing sites could contribute air pollutants, particularly particulates, to the planning area. Because the level of such activity would be relatively low and emissions would tend to be localized, this activity in conjunction with similar emission-generating projects in the cumulative analysis area would not have a cumulatively significant impact on air quality.

Fires, particularly uncontrolled fires, can significantly affect air quality by introducing large amounts of particulate, CO, atmospheric mercury, ozone precursors, and volatile organic compounds into the air, affecting both visibility and human health. Management actions described in this RMPA/EIS have the potential to reduce human-caused ignition of fires through restriction of activities on BLM-administered lands that introduce equipment and people to the landscape, while activities described in **Table 5-1** have the potential to increase the risk of human-caused fire. As described in **Section 5.6**, Wildland Fire Management and Ecology, wildland fires have been frequent in the past decade and are expected to increase in the future due to reoccurring and

increasingly severe drought conditions that are caused by climate change. 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, resulting in further increases in air pollutant emissions from fire.

5.16 CLIMATE

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have contributed GHGs to the atmosphere include actions related to solid salable minerals development, wildfire, and fuel combustion.

Development of mineral resources results in short-term and long-term emissions of GHG pollutants during fuel combustion in vehicles and construction equipment; it also removes vegetation and releases sequestered carbon. The scale of mineral extraction depends on the demand for these materials, which is driven by the level of development in an area. Actions listed in **Table 5-1** that require development of roads or ROWs may increase the demand for salable minerals, resulting in an increase in GHG emissions in the planning area from extraction activities.

The management actions proposed in this RMPA/EIS under Alternatives B and C and the Proposed Plan Amendment would close many acres of BLM-administered lands to ROW developments, which would reduce the demand for salable materials. GHG emissions associated with development on BLM-administered lands would likely be reduced compared with current conditions, and proposed BLM management actions would have no incremental cumulative impact. Under Alternatives A and D, less than 3,000 acres would be closed to salable mineral development, and emissions associated with material excavation and processing sites could contribute GHG emissions to the planning area. Because climate change occurs on a larger scale than the planning area, this activity in conjunction with similar emission-generating projects in the cumulative analysis area would contribute to global climate change but would not have a cumulatively significant impact.

Fires, particularly uncontrolled fires, can emit large quantities of GHGs into the atmosphere, including carbon dioxide, methane, and nitrous oxide (EPA 2012d); fires also remove vegetation that acts as a carbon sink. As described under **Section 5.15**, Air Resources, management actions described in this RMPA/EIS have the potential to reduce human-caused ignition of fires through restriction of activities on BLM-administered lands that would introduce equipment and people to the landscape, while activities described in **Table 5-1** have the potential to increase the risk of human-caused fire.

As described in **Section 5.6**, wildland fires have been frequent in the past decade and are expected to increase in the future due to reoccurring and increasingly severe drought conditions that are caused by climate change. 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, resulting in further increases in GHG emissions from fire.

Overall, federal and nonfederal actions within the planning area would contribute a very small percentage of state and national GHG emissions; CO_2 emissions for all of Montana were only 0.85 percent of total US CO_2 emissions in 2010 (US Energy Information Administration 2013).

5.17 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 are drought, wildland fire, and noxious weed invasion, vegetation management, range improvements, unauthorized travel, projects that would increase ROWs and energy and mineral development, and climate change.

Drought and water availability has a significant impact on vegetation in the planning area, which results in a significant impact on soil resources. Drought affects the health of rangeland, riparian areas, and forests, making them more susceptible to the invasion of weeds and fire. Noxious weeds have invaded, and would continue to invade, many locations in the planning area. Noxious weeds are managed through integrated weed management, which includes biological, chemical, mechanical, manual, and educational methods. Drought, along with the wildland fires that have occurred in the planning area and weed invasion, have contributed to current ecological conditions by impacting vegetation communities, which keep soils stabilized and reduce erosion and runoff into waterways.

Fire can impact soils in the short term through the removal of vegetation resulting in instability and increased erosion and sediment runoff. Long-term effects of fire are considered beneficial as the landscape can be returned to a healthier state with proper seeding and management, which would indirectly reduce the risk of fire and provide for more established vegetation communities, resulting in more stable soils. Vegetation management is important for soil stability as vegetation anchors soils in place and prevents excessive erosion and runoff into waterways. Vegetation management includes hazardous fuels reduction through prescribed fires, chemical and mechanical treatments, and seeding. Between 2002 and 2012 the LFO prescribed vegetation treatments on 17,437 acres, is proposing crested wheatgrass restoration, clubmoss, and mechanical treatments on approximately 1,000 acres and prescribed fire and maintenance burning on 129,000 acres, and has approved approximately 1,000 acres of conifer removal. These treatments may be implemented within the foreseeable future and could cumulatively benefit soil resources.

Range management involves constructing infrastructure in order to support livestock grazing. Between 2002 and 2012, there were 26 miles of stockwater pipelines, 42 watering sites, 8 cattleguards, and 58 fences in the planning area. Proposed rangeland improvement projects include additional fencing, stockwater pipeline, and stockwatering sites, which could cumulatively impact soils through compaction during construction and through the rearrangement of cattle movement in the planning area.

Recreation within the planning area is expected to remain at current levels or increase, and as such unauthorized travel or visitor created trails would likely continue to occur resulting in cumulative effects to soils from vegetation loss, erosion, and compaction.

Fluid mineral development would continue to impact soil resources in the planning area. For all alternatives, long-term disturbance in the planning area from oil and gas activity would be a minimum of 55,880 acres on BLM-administered lands, and 33,881 acres of BLM-administered sub-surface lands. While the BLM anticipates oil and gas activity on existing leases to remain steady in most areas, cumulative impacts are possible from new drilling and production in southern Petroleum County, which could impact soil resources through the development of temporary roads, wells, and associated well pads. However, the existing protest resolution from the Judith Resource Area Resource Management Plan (BLM 1994) would continue to defer oil and gas leasing for any nominated parcels that would require special stipulations to protect important wildlife values for the life of the RMP, which would indirectly prevent impacts from fluid mineral development on soil resources in the parcels deferred.

Existing, proposed, and foreseeable ROW development in the planning area (see **Table 5-1**) would also result in cumulative impacts on soil resources through vegetation loss, compaction, and erosion. An average of 10 ROW actions occurs each year in the planning area. The development allowed under future authorizations would result in surface-disturbance, which would generally contribute to soil degradation through compaction, erosion and sediment runoff, and vegetation clearing.

Climate change would also pose a long-term threat of cumulative impacts soil resources. Cumulative impacts on GRSG habitat and, consequently, on soil resources from climate change could include vegetation regime changes (e.g., from sagebrush to grasslands), increased wildfire potential due to drought, and increased sedimentation and erosion (Connelly et al. 2004).

Under Alternative A, the BLM would continue to allow ROWs and mineral development throughout the planning area with the result of continued cumulative impacts on soil resources. Management under Alternatives B, C, and D and the Proposed Plan Amendment 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 on BLM-administered lands. However, the ROW exclusion areas under Alternatives B and C could push ROW development onto private lands which would indirectly contribute to cumulative effects on soils on non-BLM administered lands. An indirect impact from excluding livestock grazing from BLM-administered lands under Alternative C is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This would contribute to the overall loss or degradation of soil resources In addition to establishing protective land use allocations, the Proposed Plan Amendment would implement a suite of management tools such as disturbance limits, GRSG habitat objectives, mitigation strategy, adaptive management, and lek buffer-distances throughout the range. These overlapping and reinforcing conservation measures would work in concert to improve GRSG habitat condition and would contribute to the overall protection of soil resources.

5.18 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 are drought, wildland fire, and vegetation management, livestock grazing and range improvements, unauthorized travel, projects that would increase ROWs and energy and mineral development, and climate change.

Drought affects the health of rangeland, riparian areas, and forests which make them more susceptible to the invasion of weeds and fire. Between 2002 and 2012, there were 324 wildland fires associated with drought in the planning area. Fire can impact water resources in the short term through the removal of vegetation resulting in instability of soils and increased erosion and sediment into waterways. Long-term effects of fire are considered beneficial as the landscape can be returned to a healthier state with proper seeding and management, which would indirectly reduce the risk of fire which would reduce erosion of soils into waterways. Vegetation management is important for soil stability as vegetation anchors soils in place and prevents excessive erosion and runoff into waterways. Vegetation management includes hazardous fuels reduction through prescribed fires, chemical and mechanical treatments, and seeding. Between 2002 and 2012, the LFO prescribed vegetation treatments on 17,437 acres, is proposing crested wheatgrass restoration, clubmoss, and mechanical treatments on approximately 1,000 acres and prescribed fire and maintenance burning on 129,000 acres, and has approved approximately 1,000 acres of conifer removal. These actions may be implemented within the foreseeable future and would cumulatively impact water resources for a short period.

Livestock grazing can affect water resources through the trampling of soils and vegetation along and within natural water features and through the formation of

fecal coliforms in waterways. Livestock grazing is associated with range management, which involves constructing infrastructure in order to support livestock grazing. Between 2002 and 2012, there were 26 miles of stockwater pipelines, 42 watering sites, 8 cattleguards, and 58 fences constructed in the planning area on BLM-administered land. Proposed rangeland improvement projects include additional fencing, stockwater pipeline, and stockwatering sites, which could cumulatively impact waters through compaction and erosion of soils during construction and result in runoff into waterways. Additionally, increasing the number of stockwatering sites correspondingly increases the risk of mosquito breeding habitat being created, which increases the risk of spreading West Nile virus. However, stockwatering sites and other water developments can benefit GRSG and other wildlife by increasing the availability of water resources and providing for alternative water resources. Also, increased water resource sites can better disperse cattle across the landscape, and stockwatering sites can reduce the use of riparian areas by livestock.

Recreation within the planning area is expected to remain at current levels or increase, and as such unauthorized travel or visitor created trails would likely continue to occur resulting in cumulative effects to water resources from soil compaction, erosion, and sedimentation into waterways.

Fluid mineral development of existing leases would continue to impact water resources in the planning area. For all alternatives, long-term disturbance associated with oil and gas activity on existing leases could occur on a minimum of 55,880 acres of BLM-administered lands and 33,881 acres of BLM-administered sub-surface lands. The amount of disturbance is unknown. While the BLM anticipates oil and gas activity on existing leases to remain steady in most areas, cumulative impacts are possible from new drilling and production in southern Petroleum County, which could impact water resources through an increase in the presence of petroleum-using vehicles and equipment, which increases the likelihood of chemical spills, erosion, and contamination of waterways. Fluid mineral development can increase the likelihood of the creation of pools of standing water, which can serve as mosquito breeding habitat, increasing the ability for West Nile virus to spread into a landscape otherwise not at risk to the pathogen. However, the existing protest resolution from the Judith Resource Area Resource Management Plan (BLM 1994) would continue to defer oil and gas leasing for any nominated parcels that would require special stipulations to protect important wildlife values for the life of the RMP, which would indirectly prevent impacts from fluid mineral development on water resources in the parcels deferred.

Climate change would also pose a long-term threat of cumulative impacts on water resources. Cumulative impacts on GRSG habitat and, consequently, on water resources from climate change could include vegetation regime changes (e.g., from sagebrush to grasslands), increased wildfire potential due to drought, and increased sedimentation and erosion into waterways (Connelly et al. 2004).

Existing, proposed, and foreseeable ROW development in the planning area (see **Table 5-1**) would also result in cumulative impacts on water resources through man-made runoff of soils and chemicals into waterways. An average of 10 ROW actions occurs each year in the planning area. The development under future authorizations would result in surface-disturbance, which would generally contribute to a decrease in water quality through compaction, erosion, and sediment runoff into waterways as well as an increase in the potential for chemical contamination.

Under Alternative A, the BLM would continue to allow ROWs, mineral development, and grazing throughout the planning area with the result of continued cumulative impacts on water resources. Alternatives B, C, and D and the Proposed Plan Amendment would include limitations on surface-disturbing activities, such as ROW development, grazing, and mineral development, reducing the potential for long-term cumulative impacts on water resources on BLM-administered lands. However, the ROW exclusion areas under Alternatives B and C could push ROW development onto private lands, which would indirectly contribute to cumulative effects on water resources on non-BLM-administered lands. An indirect impact from excluding livestock grazing from BLM-administered lands under Alternative C is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This could contribute to the overall degradation of water resources. In addition to establishing protective land use allocations, the Proposed Plan Amendment would implement a suite of management tools such as disturbance limits, GRSG habitat objectives, mitigation strategy, adaptive management, and lek buffer-distances throughout the range. These overlapping and reinforcing conservation measures would work in concert to improve GRSG habitat condition and would contribute to the overall protection of water resources.

5.19 SPECIAL STATUS SPECIES – OTHER SPECIES OF ISSUE

Many past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect special status species other than GRSG are described in **Table 5-1**. The future actions most likely to affect special status species are likely associated with energy development, livestock grazing, and lands and realty. Special status species in and adjacent to the planning area, in addition to GRSG, include black-tailed prairie dog, breeding populations of mountain plover, chestnut-collared longspur, and Brewer's sparrow. See **Section 5.3** for a discussion of cumulative impacts on GRSG. In general, special status species populations within the LFO are in decline and this trend is attributed to increased habitat fragmentation, spread of noxious weeds, and lack of fire on the landscape and/or fire suppression, and infrastructure development. Other actions that may contribute to cumulative impacts include vegetation management, recreation, noxious weeds, wildland fires, spread of forest insects and disease, drought, and climate change.

Cumulative impacts from future management actions described in **Table 5-1** would likely increase the number of surface acres disturbed by oil and gas exploration and development over the long term. However, existing protest resolution from the Judith Resource Area Resource Management Plan (BLM 1994) would continue to defer oil and gas leasing for any nominated parcels that would require special stipulations to protect important wildlife values for the life of the RMP as described in **Section 1.3**. Vegetation management, including prescribed fire, weed control, and other vegetation treatments, has occurred on 17,437 acres in the LFO between 2002 and 2012. These treatments and other vegetation reseeding and restoration efforts would likely continue or increase across the planning area in the future, benefitting special status species and their habitat.

Livestock grazing in the cumulative analysis area has decreased over the past century and current grazing demands on BLM-administered lands and private lands have been stable between 2002 and 2012. Increases in livestock grazing infrastructure, including stockwater pipelines, watering sites, cattleguards, and fences have occurred between 2002 and 2012 in the planning area and more range improvements are proposed. Short-term surface disturbances associated with future range improvement projects could decrease available habitat for special status species. However, in the long term these improvements could decrease the ecological impacts from livestock grazing by protecting habitat and forage areas for special status species or by reducing impacts on riparian habitat by establishing common watering areas.

Recreation and visitor use would likely continue to have increased usage within the planning area. The lands and realty program is expected to receive increased ROW applications for development and infrastructure-related projects. There are several land actions that are pending in the planning area which include land exchanges and donations of approximately 1,000 acres that would likely benefit special status species habitat. These small gains in potential habitat for special status species would likely be eclipsed by surface disturbances associated with future development. The continuing trend of the spread of noxious weeds, occurrence of wildland fires, as well as the spread of forest insects and disease would likely continue to decrease habitat conditions for special status species. Changing climatological conditions between 2002 and 2012 in the western US have produced drought conditions which could be attributed to the increased occurrence of wildland fires and spread of forest insects and disease. Continuation of drought throughout the planning area would decrease the availability of special status species habitat.

Four indicators were identified to analyze the effects on special status species under each alternative in **Section 4.19**. These indicators include acres of ROW exclusion area, acres of ROW avoidance area, acres closed to livestock grazing, and available AUMs. Management under Alternative A would generally have the greatest cumulative impacts, because it would provide the fewest considerations

of ecological impacts in management decisions. Management under Alternative D and the Proposed Plan Amendment would result in slightly fewer cumulative impacts on special status species due to an increase in the number of acres of ROW avoidance area compared to Alternative A. Management under Alternative B would have fewer acres of ROW avoidance areas but would include 233,219 acres of ROW exclusion area compared to Alternative A. Management under Alternative C would have the largest increase in ROW exclusion area and is the only alternative to consider closing a substantial amount of land to livestock grazing (345,560 acres). Additionally, Alternative C would remove 69,408 AUMs on BLM-administered lands and would result in the least cumulative impacts among the draft alternatives and Proposed Plan Amendment. The impacts on special status species habitat on BLM-administered lands may be reduced from removing ROW development in ROW exclusion areas; however, ROW exclusion areas could result in more widespread development on private lands, and may not reduce overall impacts on special status species habitat. An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for special status species that inhabit land outside of BLM-administered lands.

In addition to establishing protective land use allocations, the Proposed Plan Amendment would implement a suite of management tools such as disturbance limits, GRSG habitat objectives, mitigation strategy, adaptive management, and lek buffer-distances throughout the range. These overlapping and reinforcing conservation measures would work in concert to improve GRSG habitat condition and would contribute to the overall protection of special status species and their habitat.

5.20 FISH AND WILDLIFE

As discussed in **Section 3.21**, implementation of any of the alternatives would result in general and unquantifiable indirect beneficial effects for fish in terms of greater protection through new restrictions on surface and resource use resulting in reduced opportunities for surface disturbance or habitat disruption where they exist. Therefore, general fish species will not be discussed further in **Chapter 5**.

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect wildlife species are described in **Table 5-1**. The future actions most likely to affect wildlife are likely associated with energy development, livestock grazing, and lands and realty. Key wildlife species described in **Section 3.21** include a wide variety of bird species, and big game. Generally, wildlife species in the planning area are common, and their populations are stable. Threats to wildlife species within the planning area include habitat fragmentation, spread of

noxious weeds, lack of fire on the landscape, lack of fire suppression, and infrastructure development. Other actions that may contribute to cumulative impacts include vegetation management, recreation, noxious weeds, wildland fires, spread of forest insects and disease, drought, and climate change.

Cumulative impacts from future management actions described in **Table 5-1** would likely increase the number of surface acres disturbed by oil and gas exploration and development over the long term. However, existing protest resolution from the Judith Resource Area Resource Management Plan (BLM 1994) would continue to defer oil and gas leasing for any nominated parcels that would require special stipulations to protect important wildlife values for the life of the RMP as described in **Section 1.3**. Vegetation management including prescribed fire, weed control, and other vegetation treatments has occurred on 17,437 acres in the LFO between 2002 and 2012. These treatments and other vegetation reseeding and restoration efforts would likely continue or increase across the planning area in the future, benefitting wildlife species and their habitat.

Livestock grazing in the RMP planning area has decreased over the past century and current grazing demands on BLM-administered lands and private lands have been stable between 2002 and 2012. Increases in livestock grazing infrastructure, including stockwater pipelines, watering sites, cattleguards, and fences have occurred between 2002 and 2012 in the planning area and more range improvements are proposed. Short-term surface disturbances associated with future range improvement projects could decrease available habitat for wildlife species. However, in the long term these improvements could decrease the ecological impacts from livestock grazing by protecting habitat and forage areas for wildlife species. Additionally, establishing common watering areas could reduce impacts on riparian habitat.

Recreation and visitor use would likely continue to have increased usage within the planning area. The lands and realty program is expected to receive increased ROW applications for development and infrastructure-related projects. Impacts on wildlife species would still continue to occur outside of the BLM-administered lands as a result of the large expanse and variety of non-BLM-administered lands within PHMA (974,775 acres) and GHMA (902,694 acres). There are several land actions that are pending in the planning area which include land exchanges and donations of approximately 1,000 acres that would likely benefit wildlife species habitat. These small gains in potential habitat for wildlife species would likely be eclipsed by surface disturbances associated with future development. The continuing trend of the spread of noxious weeds, occurrence of wildland fires, as well as the spread of forest insects and disease, would likely continue to decrease habitat conditions for wildlife species. Changing climatological conditions between 2002 and 2012 in the western US have produced drought conditions which could be attributed to the increased occurrence of wildland fires and spread of forest insects and disease.

Continuation of drought throughout the planning area would decrease the availability of wildlife species habitat.

Four indicators were identified to analyze the effects on wildlife species under each alternative in **Section 4.20**, Fish and Wildlife. These indicators include acres of ROW exclusion area, acres of ROW avoidance area, acres closed to livestock grazing, and available AUMs. Management under Alternative A would generally have the greatest cumulative impacts, because it provides the fewest considerations of ecological impacts in management decisions. Management under Alternative D and the Proposed Plan Amendment would result in slightly fewer cumulative impacts on wildlife species due to an increase in the number of acres of ROW avoidance area compared to Alternative A. Management under Alternative B would have fewer acres of ROW avoidance areas but would include 233,219 acres of ROW exclusion area compared to Alternative A. Management under Alternative C would have the largest increase in ROW exclusion area and is the only alternative to consider closing a substantial amount of land to livestock grazing (337,165 acres). Additionally, management under Alternative C would remove 69,408 AUMs on BLM-administered lands and would result in the least cumulative impacts among the draft alternatives and Proposed Plan Amendment. The impacts on wildlife habitat on BLM-administered lands may be reduced from removing ROW development in ROW exclusion areas; however, ROW exclusion areas could result in more widespread development on private lands, and may not reduce overall impacts on wildlife habitat. An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for wildlife species that inhabit land outside of BLM-administered lands.

In addition to establishing protective land use allocations, the Proposed Plan Amendment would implement a suite of management tools such as disturbance limits, GRSG habitat objectives, mitigation strategy, adaptive management, and lek buffer-distances throughout the range. These overlapping and reinforcing conservation measures would work in concert to improve GRSG habitat condition and would contribute to the overall protection of fish and wildlife, and their habitat.

5.21 RENEWABLE ENERGY

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 renewable energy are the construction of existing and proposed roads and transmission lines. They would have a minor cumulative effect by increasing the routing options and possibly reducing project construction or implementation costs.

As stated in **Section 4.21**, there is no "Good" (6.0 kilowatt-hours/square meter/day) or better solar potential within the planning area. As such, none the alternatives would result in cumulative impacts on solar energy development potential.

Across all alternatives the primary indicator of impacts on wind energy is acres of BLM-administered lands with "Good" or better wind potential within ROW exclusion and ROW avoidance areas. The minor cumulative impact of increased routing options and decreased project costs caused by construction of existing and proposed roads and transmission lines could encourage wind energy development on the small percentage of BLM-administered lands that would not be subject to these ROW restrictions. However, under Alternatives B, C, and D and the Proposed Plan Amendment, development of wind energy resources on BLM-administered lands are still unlikely due to the fact that 70 percent or more of "Good" or better wind potential land within the planning area would be designated as either ROW avoidance or exclusion areas. For wind-power developers, these ROW restrictions would likely negate any positive cumulative impacts caused by the increased routing options and decreased project costs caused by construction of existing and proposed roads and transmission lines. Alternative C and the Proposed Plan Amendment would result in the greatest long-term reduction in future wind energy development opportunities in the planning area.

Under Alternative A, wind energy development applications would continue to be processed on a case-by-case basis, with no additional acres designated as ROW exclusion or ROW avoidance areas. Therefore, the cumulative impacts of increased routing options and decreased project costs caused by the construction of existing and proposed roads and transmission lines would encourage wind energy development the most of any alternative. However, this cumulative effect would still be considered minor.

5.22 Social and Economic Conditions

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 social and economic conditions are those that impact level of employment or income or those that effect quality of life and related non-market values. These activities can include mineral exploration and development, unauthorized travel, livestock grazing, recreation, development in ROWs, weed invasion and spread, prescribed and wildland fires, land planning efforts, vegetation treatments and habitat improvement projects, insects and disease, and drought.

Actions proposed in this RMPA/EIS would contribute to the cumulative impacts on employment and labor income directly as a result of labor required, and indirectly as purchases are made between industry sectors and households spend resulting income. These contributions would accrue in the five-county

impact area alongside impacts from other projects occurring on public and private land in the area notably, development of existing BLM-administered surface/federal minerals and development of authorized ROWs and potential development of pending ROW authorizations (see **Table 5-1**).

The economy can also be affected by a variety of factors including population growth, changes in interest rates, recession, growth of new sectors, tax policy, state economic policy, etc. When compared to these factors, the RMPA alternatives are likely to have a negligible cumulative effect on the impact area economy. For example, total employment in the five-county impact area in 2010 was 13,808, and labor income was $383 million. Employment decreases under Alternative C would comprise 0.97 and 0.10 percent of total employment and labor income. Because any changes in economic activity from the alternatives and Proposed Plan Amendment would be unnoticeable at these levels, there should be no cumulative economic effects for the entire economy.

However, as noted above, the five-county impact area can be considered specialized with respect to the grazing sector. Decreases in employment and labor income under Alternative C, due to reductions of AUMs on BLM-administered lands, would reduce contributions to the grazing sector from 201 to 66 jobs which could result in a 30 percent decrease in employment in this sector. Decreases may not be as large since actual use of BLM-administered lands is not always equal to allocated use levels analyzed here. For example, actual employment associated with billed use during any given year could be less than 201 jobs if actual use of BLM forage is less than allocated (possibly due to increases in prices of factors of production, drought, market conditions, etc.). In addition, the decrease portrayed here could be less if alternative sources of forage is found for lessees/permittees willing to use substitutes. Regardless, an adverse effect such as an increase in price of factors of production, drought, or change in market conditions would occur on the grazing sector if changes occur for ranching and grazing on private and other public lands outside the scope of this RMPA.

5.23 ENVIRONMENTAL JUSTICE

Actions in the alternatives and Proposed Plan Amendment are not anticipated to have a disproportionate impact on those in low-income or minority populations. As a result, the alternatives and Proposed Plan Amendment would not contribute to cumulative impacts for environmental justice.

Chapter 6

Consultation and Coordination

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CHAPTER 6
CONSULTATION AND COORDINATION

This chapter describes the public outreach and participation opportunities made available through the development of this RMPA/EIS, and consultation and coordination efforts with tribes, government agencies, and other stakeholders. This chapter also lists the interdisciplinary team of staff who prepared the draft RMPA and associated EIS.

The BLM land use planning activities are conducted in accordance with requirements of NEPA, CEQ regulations, and BLM policies and procedures implementing NEPA. The NEPA and associated laws, regulations, and policies require the BLM to seek public involvement early in and throughout the planning process to develop a reasonable range of alternatives to proposed actions, and to prepare environmental documents that disclose the potential impacts of proposed actions and alternatives. Public involvement and agency consultation and coordination, which have been at the heart of the planning process leading to this RMPA/EIS, were achieved through *Federal Register* notices, public meetings, agency briefings, individual contacts, media releases, and the Rocky Mountain Region – National Greater Sage-Grouse Planning Strategy website, http://www.blm.gov/wo/st/en/prog/more/sagegrouse/eastern.html.

6.1 CHANGES BETWEEN THE DRAFT EIS AND FINAL EIS

- A summary of the public comment period and public comments on the Draft RMPA/EIS was added in **Section 6.5.2,** Public Comment Period on the Draft RMPA and EIS**,** and **Section 6.5.3,** Summary of Comments Received on the Draft RMPA/EIS.
- Future opportunity for public involvement was added in **Section 6.5.4**, Future Public Involvement.
- A summary of the distribution of the Proposed RMPA/EIS was added in **Section 6.6,** Distribution of the Proposed RMPA/Final EIS.

6.2 CONSULTATION AND COORDINATION

Federal laws require the BLM to consult with certain federal and state agencies and entities, and Native American tribes (40 CFR, Part 1502.25) during the NEPA decision-making process. The BLM is also directed to integrate NEPA requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 CFR, Part 1500.4-5).

In addition to formal scoping (**Section 6.5.1**, Scoping Process), as summarized below, the BLM has implemented an extensive collaborative outreach and public involvement process that has included coordinating with cooperating agencies. The BLM will continue to meet with interested agencies and organizations throughout the planning process, as appropriate, and will continue coordinating closely with cooperating agencies.

The LFO offered formal Government-to-Government consultation with tribes that are identified as having interests in the RMPA planning area. Letters were mailed to the tribes listed below in December 2011, with follow-up letters mailed in September 2012. The follow-up letter invited the tribes to serve as cooperating agencies and offered government-to-government consultation. Consultation with American Indians and federally recognized tribes is required under a variety of laws, regulations, Executive Orders and BLM policies. The federally recognized tribes with interests in the planning area are the: Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, Blackfeet Tribe of the Blackfeet Indian Reservation of Montana, Chippewa-Cree Indians of the Rocky Boy's Reservation, Confederated Salish and Kootenai Tribes of the Flathead Reservation, Crow Tribe of Montana, Fort Belknap Indian Community of the Fort Belknap Reservation of Montana, Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Nez Perce Tribe of Idaho, and the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho.

No written comments were received from tribal agencies during the scoping period. Follow up phone calls to the letters that were sent in September 2012 were made with the tribes in regards to their desire for government-to-government consultation between September 24 and October 9, 2012 during which time no comments were received, and no requests for formal government-to-government consultation requested by any of the tribes. Government-to-government outreach and consultation as requested will continue throughout the RMPA process to ensure that the concerns of tribal groups are considered in development of the RMPA. This EIS does not impact any tribal lands or any tribal oil and gas interests (there are none within this planning area), nor does it restrict any access to sacred sites.

Consultation with the Montana State Historic Preservation Office (SHPO) occurred along with SHPO's review of the Draft EIS. The SHPO raised no concerns.

To comply with Section 7(c) of the ESA, the BLM coordinated and consulted the USFWS early in the planning process. The USFWS provided input on planning issues, data collection and review, and alternatives development. The proposed actions under all alternatives and the Proposed Plan Amendment would have **No Effect** on any Threatened or Endangered species in the planning area.

6.3 COOPERATING AGENCIES

A cooperating agency is any federal, state, or local government agency or Indian tribe that enters into a formal agreement with the lead federal agency to help develop an environmental analysis. More specifically, cooperating agencies "work with the BLM, sharing knowledge and resources, to achieve desired outcomes for public lands and communities within statutory and regulatory frameworks" (BLM *Land Use Planning Handbook* H-1601-1; BLM 2005a). The primary role of cooperating agencies during the planning process is to provide input on issues for which they have a special expertise or jurisdiction.

On December 7, 2012, the BLM wrote to local, state, federal, and tribal representatives, inviting them to participate as cooperating agencies for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. Twelve agencies agreed to participate in the RMPA as designated cooperating agencies, all of which have signed memoranda of understanding with the BLM (**Table 6-1**).

Table 6-1
Cooperating Agencies

Agencies and Tribes Invited to be Cooperators	Agencies that Signed MOUs
US Department of the Interior, Fish and Wildlife Service	✓
Montana Department of Fish, Wildlife and Parks	✓
United States Bureau of Indian Affairs	
United States Bureau of Reclamation	
USFWS Charles M. Russell National Wildlife Refuge	
Montana Department of Natural Resources and Conservation	
United States Forest Service	✓
Natural Resources Conservation Service	✓
United States Environmental Protection Agency	
Montana State Historic Preservation Office	
Chouteau County Commissioners	
Fergus County Commissioners	✓
Petroleum County Commissioners	✓
Meagher County Commissioners	
Teton County Commissioners	
Pondera County Commissioners	
Judith Basin County Commissioners	✓
Cascade County Commissioners	
Indian Butte CSGD	✓
Crooked Creek CSGD	
Grass Range CSGD	
Flatwillow CSGD	

Table 6-1
Cooperating Agencies

Agencies and Tribes Invited to be Cooperators	Agencies that Signed MOUs
Chain Buttes CSGD	✓
Winnett CSGD	✓
Williams Coulee CSGD	
Weede Coulee CSDG	
Petroleum County Conservation District	✓
Blackfeet Tribal Business Council	
Confederated Salish and Kootenai Tribes of the Flathead Reservation	
Chippewa-Cree Indians of the Rocky Boy's Reservation	
Crow Tribe of Montana	
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	
Assiniboine and Sioux Tribes of the Fort Peck Indian ReservationNorthern	
Cheyenne Tribe of the Northern Cheyenne Indian Reservation	
Nez Perce Tribe of Idaho	
Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho	

Starting on June 26, 2012, the BLM has conducted four meetings to date with cooperating agencies. The focus of the meetings was to explain the purpose and need for the RMPA/EIS and the process and to develop a sub-regional management alternative. The entities that were invited to become cooperating agencies were also encouraged to attend the scoping open houses and provide comments during the scoping period (**Section 6.5.1**). These agencies have been engaged throughout the planning process, including during alternatives development.

6.4 COORDINATION AND CONSISTENCY

The BLM's planning regulations (43 CFR, Part 1610) require that its RMPs be consistent with officially approved or adopted resource-related plans of other federal, state, local, and tribal governments, to the extent that those plans are consistent with federal laws and regulations applicable to public lands. Plans formulated by federal, state, local, and tribal governments that relate to management of lands and resources have been reviewed and considered as the RMPA/EIS has been developed. These plans can be found in **Chapter 1**, **Section 1.8**, Relationship to Other Policies, Plans, and Programs.

6.5 PUBLIC INVOLVEMENT

Public involvement is a vital and legal component of both the RMPA and EIS processes. Public involvement vests the public in the decision making process and allows for full environmental disclosure. Guidance for implementing public involvement under NEPA is codified in 40 CFR, Part 1506.6, thereby ensuring that federal agencies make a diligent effort to involve the public in the NEPA process. Section 202 of FLPMA directs the Secretary of the Interior to establish procedures for public involvement during land use planning actions on BLM-

administered lands. These procedures can be found in the BLM's *Land Use Planning Handbook* (H-1601-1; BLM 2005a). Public involvement for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS includes the following four phases:

1. Public scoping before beginning NEPA analysis to determine the scope of issues and alternatives to be addressed in the RMPA/EIS
2. Public outreach via newsletters and news releases
3. Collaboration with federal, state, local, and tribal governments, and cooperating agencies
4. Public review of and comment on the draft RMPA/EIS, which analyzes likely environmental effects and identifies the BLM's preferred alternative

The public scoping phase (phase 1) of the process has been completed and is described in **Section 6.5.1**. The public outreach and collaboration phases (2 and 3) are ongoing throughout the RMPA/EIS process. Phase 4 of the process has been completed and is described in **Section 6.5.2**, Public Comment Period on the Draft RMPA and EIS.

6.5.1 Scoping Process

The formal public scoping process for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS began on December 9, 2011, with the publication of the notice of intent in the *Federal Register* (76 *Federal Register* 77008-77011). The notice of intent notified the public of the BLM's intent to prepare NEPA environmental documents to incorporate GRSG conservation measures into land use plans; it also initiated the public scoping period, which closed on March 29, 2012. A notice of correction to the notice of intent was released on February 10, 2012 (77 *Federal Register* 7178-7179). The notice of correction extended the scoping period until March 23, 2012.

Project Website

The BLM launched a national GRSG conservation website as part of its efforts to maintain and restore GRSG habitat on BLM-administered lands. The national website is available on the Internet at:

http://www.blm.gov/wo/st/en/prog/more/sagegrouse.html

The BLM has also launched a Rocky Mountain regional website at:

http://www.blm.gov/wo/st/en/prog/more/sagegrouse/eastern.html

These sites are regularly updated to provide the public with the latest information about the planning process. The Rocky Mountain website provides background information about the project, a public involvement timeline, maps of the planning areas, and copies of public information documents and the notice

of intent. The dates and locations of scoping open houses were also announced on the Rocky Mountain website.

Press Release

A press release was made available on the national and Rocky Mountain Region websites on December 8, 2011, announcing the scoping period. The LFO also distributed a press release on December 22, 2012, announcing the scoping period for the GRSG planning effort. The press releases provided information on the scoping open houses and described the various methods for submitting comments. A second press release was posted on the national and Rocky Mountain websites on February 7, 2012, announcing the extension of the public scoping period to March 23, 2012.

Public Scoping Open House

The BLM hosted an open house in Lewistown, Montana, on January 10, 2012, to provide the public with an opportunity to become involved, to learn about the project and the planning process, to meet the planning team members, and to offer comments. The open house was advertised via a press release and the Rocky Mountain website. The scoping meeting was held in an open house format to encourage participants to discuss concerns and questions with BLM and other agency staff representatives.

Scoping Comments Received

Detailed information about the comments received can be found in the *National Greater Sage-Grouse Planning Strategy Scoping Summary Report*, finalized in May 2012 (BLM 2012b). A total of 272 unique written submissions for the Rocky Mountain Region, which includes the LFO, were received during the public scoping period. In the Scoping Summary Report, the comments that pertain to the LFO are listed in the eastern Montana section. There were only 12 unique comments specific to eastern Montana. The issues identified during public scoping and outreach helped refine the list of planning issues, included in **Section 1.6.3**, which guided the development of alternative management strategies for the RMPA.

6.5.2 Public Comment Period on the Draft RMPA and EIS

A notice of availability announcing the release of the Draft RMPA and EIS was published in the *Federal Register* on November 8, 2013 (78 *Federal Register* 67186-67187), initiating a 90-day public comment period. During the 90-day public comment period, the public was provided the opportunity to review and comment on the Draft RMPA and EIS.

Notification

The BLM issued a news release on November 8, 2013, announcing the release of the Draft RMPA and EIS, which provided the dates and times of the public commenting open houses. An article regarding the release of the Draft RMPA and EIS was published in the Lewistown News Argus on November 13, 2013.

Public Open Houses

During the public comment period, the BLM hosted an open house in Lewistown, Montana on December 10 and in Winnett, Montana on December 18. The public open houses provided opportunities for the public to ask questions and submit comments. BLM managers, resource specialists, and other representatives of the BLM were present during these open houses to discuss and answer questions.

6.5.3 Summary of Comments Received on the Draft RMPA/EIS

Process and Methodology

Comments on the Draft RMPA/EIS covered a wide spectrum of thoughts, opinions, ideas, and concerns. The BLM recognizes that commenters invested considerable time and effort to submit comments on the Draft RMPA/EIS, and developed a comment analysis methodology to ensure that all comments were considered as directed by NEPA regulations.

According to NEPA, the BLM is required to identify and formally respond to all substantive public comments. The BLM developed a systematic process for responding to comments to ensure all substantive comments were tracked and considered. Upon receipt, each comment letter was assigned an identification number and logged into CommentWorks, a Web-based database that allowed the BLM to organize, categorize, and respond to comments. Substantive comments from each letter were coded to appropriate categories based on content of the comment, retaining the link to the commenter. The categories generally follow the sections presented in the Draft RMPA/EIS, though some relate to the planning process or editorial concerns.

Comments similar to each other were grouped under a topic heading, and the BLM drafted a statement summarizing the ideas contained in the comments. The responses were crafted to respond to the comments; a response indicates whether or not the commenters' points resulted in a change in the document. As a result of public comments, changes were made to the Draft RMPA/EIS and reflect consideration given to public comments. A summary of major changes between the Draft RMPA/EIS and the Proposed RMPA/Final EIS can be found in **Section 1.9**, Changes from Draft RMPA to the Proposed RMPA, in Chapter 1, Introduction.

Although each comment letter was diligently considered, the comment analysis process involved determining whether a comment was substantive or nonsubstantive in nature. In performing this analysis, the BLM relied on the CEQ's regulations to determine what constituted a substantive comment.

A substantive comment does one or more of the following:

- Questions, with a reasonable basis, the accuracy of the information and/or analysis in the EIS

- Questions, with a reasonable basis, the adequacy of the information and/or analysis in the EIS
- Presents reasonable alternatives other than those presented in the Draft EIS that meet the purpose and need of the proposed action and address significant issues
- Questions, with a reasonable basis, the merits of an alternative or alternatives
- Causes changes in or revisions to the proposed action
- Questions, with a reasonable basis, the adequacy of the planning process itself

Additionally, BLM's NEPA handbook identifies the following types of substantive comments:

- Comments on the Adequacy of the Analysis: Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate are substantive in nature but may or may not lead to changes in the Final EIS. Interpretations of analyses should be based on professional expertise. Where there is disagreement within a professional discipline, a careful review of the various interpretations is warranted. In some cases, public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the manager responsible for preparing the EIS (the Authorized Officer) does not think that a change is warranted, the response should provide the rationale for that conclusion.
- Comments That Identify New Impacts, Alternatives, or Mitigation Measures: Public comments on a Draft EIS that identify impacts, alternatives, or mitigation measures that were not addressed in the draft are substantive. This type of comment requires the Authorized Officer to determine whether it warrants further consideration. If it does, the Authorized Officer must determine whether the new impacts, new alternatives, or new mitigation measures should be analyzed in the Final EIS, a supplement to the Draft EIS, or a completely revised and recirculated Draft EIS.
- Disagreements with Significance Determinations: Comments that directly or indirectly question, with a reasonable basis, determinations regarding the significance or severity of impacts are substantive. A reevaluation of these determinations may be warranted and may lead to changes in the Final EIS. If, after reevaluation, the Authorized Officer does not think that a change is warranted, the response should provide the rationale for that conclusion.

Some submissions received contained substantive comments but were out of the scope of this project. These included comments on subjects not related to this effort, other GRSG efforts, or BLM laws, rules, regulations, or policy. These comments were reviewed and sent along to the appropriate party as needed, but are not included in the comment response for this effort.

Comments that failed to meet the above description were considered nonsubstantive. Many comments received throughout the process expressed personal opinions or preferences, had little relevance to the adequacy or accuracy of the Draft RMPA/EIS, or represented commentary regarding resource management without any real connection to the document being reviewed. These comments did not provide specific information to assist the planning team in making a change to the Preferred Alternative, did not suggest other alternatives, did not take issue with methods used in the Draft RMPA/EIS, and are not addressed further in this document. Examples of some of these comments include the following:

- The best of the alternatives is Alternative D (or A, B, or C).
- The BLM has yet to show land stewardship at or above the level currently demonstrated by the private sector.
- Your plan does not reflect balanced land management.
- Stop giving away land to the mineral companies.
- More land should be protected as wilderness.
- I want the EIS to reflect the following for this area: no grazing, no drilling, no mining, and no OHVs.
- Do not add any more road closures to what is now in existence.
- People need access and the roads provide revenue for local communities.
- More areas should be made available for multiple uses (drilling, OHVs, ROWs, etc.) without severe restrictions.

Opinions, feelings, and preferences for one element or one alternative over another, and comments of a personal and/or philosophical nature were all read, analyzed, and considered, but because such comments are not substantive in nature, the BLM did not respond to them. It is also important to note that, while all comments were reviewed and considered, comments were not counted as "votes." The NEPA public comment period is neither considered an election nor does it result in a representative sampling of the population. Therefore, public comments are not appropriate to be used as a democratic decision-making tool or as a scientific sampling mechanism.

Comments citing editorial changes to the document were reviewed and incorporated where needed.

Summary of Written Comments Received

The comment period closed on February 6, 2014. All written comments sent before 12:00 AM on February 7, 2014, were accepted as official comments. These included those sent by US mail postmarked on February 6, 2014, and email messages and facsimiles sent on February 6, 2014, regardless of when they were received. Some comments were duplicated with an email message and a letter submitted via US mail. Identical comments from the same party were considered only once.

A total of 40 unique comment letters, forms, and emails were received during the 90-day public comment period. These documents resulted in 257 substantive comments. Out of the 40 comment letters, 17 were submitted by private individuals (43 percent); 12 by wildlife or environmental protection groups (30 percent); 5 by associations (including trade and industry groups, 13 percent); 2 by both federal government agencies and local government agencies (5 percent each); and 1 by both businesses and state government agencies (3 percent). The BLM parsed 257 substantive comments from the 40 submissions. Wildlife or environmental protection groups submitted 117 of these comments (46 percent), 66 were submitted by associations (26 percent), 41 were submitted by federal government agencies (16 percent), 18 were submitted by private individuals (7 percent), 11 were submitted by state government agencies (4 percent), and 4 substantive comments were submitted by local government agencies (2 percent, see **Table 6-2**).

Table 6-2
Number of Unique Submissions and Comments by Commenter Affiliation

Affiliation	Number of Submissions	Number of Comments
Government agencies		
Federal Government	2	41
State Government	1	11
Local Government	2	4
Association (includes trade and industry groups)	5	66
Businesses	1	0
Wildlife or environmental protection groups	12	117
Private individuals	17	18
Total	**40**	**257**

In addition to the unique submissions discussed above, 5,580 form letters were submitted during the public comment period. Form letters are exact or very close copies of a letter that are submitted by different individuals; individuals may add additional language to the letter, but this usually does not substantially change the content of the letter. Often, form letters are created by an organization and sent to their members, who in turn submit this letter to the planning effort. For the LFO RMPA/EIS, 2,927 form letters submitted were from WildEarth Guardians, 2,650 form letters were from Defenders of Wildlife, and 3

form letters were from the Montana Wilderness Association. A master copy of each form letter was included in the comment analysis process. All of the form letters were reviewed for additional substantive content; these were included in the comment analysis process when present.

A review of the 257 substantive comments received revealed a high level of interest about the management of GRSG (73 comments, 28 percent), livestock grazing (37 comments, 14 percent), and compliance with NEPA and FLPMA (NEPA: 23 comments, 9 percent; and FLPMA: 9 comments, 4 percent). Topics that received moderate interest were lands and realty (15 comments, 6 percent), leasable minerals (12 comments, 5 percent), lands with wilderness characteristics (8 comments, 3 percent), travel management (7 comments, 3 percent), and other laws (6 comments, 2 percent). The topics with the least amount of interest were fire and fuels and water resources (5 comments, 2 percent each); the disturbance cap (4 comments, 2 percent); climate change, invasive weeds, locatable minerals, noise, salable minerals, socioeconomics, and sagebrush vegetation (3 comments, 1 percent each); ACECs, recreation, and soil resources (2 comments, 1 percent each); and cultural resources and fish and wildlife (1 comment, less than 1 percent each). In addition to these topics, substantive comments were collected that were considered out of scope of this planning effort (13 comments, 5 percent) and suggested editorial changes (10 comments, 4 percent). These comments were reviewed and considered but not included in the formal comment responses effort. See **Table 6-3**.

Table 6-3
Summary of Comments Received on Draft RMPA/EIS by Category

Category	Number of Comments
GRSG	73
Livestock grazing	37
NEPA	23
Lands and realty	15
Leasable minerals	12
FLPMA	9
LWC	8
Travel management	7
Other laws	6
Fire and fuels	5
Water resources	5
Disturbance cap	4
Climate change	3
Invasive weeds	3
Locatable minerals	3
Noise	3
Saleable minerals	3
Socioeconomics	3

Table 6-3
Summary of Comments Received on Draft RMPA/EIS by Category

Category	Number of Comments
Vegetation - sagebrush	3
ACECs	2
Recreation	2
Soil resources	2
Cultural resources	1
Fish and wildlife	1
Predation	1
Out of scope	13
Edits	10
Total	**257**

The comments received on the Draft RMPA/EIS were similar to the issues raised during public scoping. In many cases, comments expressed a desire for very specific implementation-level (project-level) details to be included in the RMPA. As described in Chapters 1 and 2, the RMPA/EIS provides general guidance and identifies allowable uses and allocations but is not meant to address all details about individual projects. A separate environmental review will be conducted for specific projects at the implementation level to address these details. Some comments spanned several topical areas and included a discussion about a resource use or activity and listed concerns about the resources that would be impacted by the use, or conversely, the impact that restrictions would have on resource uses or activities.

All substantive comments, detailed summaries, and responses organized by resource, resource use, or EIS planning regulation can be found in **Appendix O**. An overview of these summaries and responses can be found below in **Table 6-4**. Comments related to editorial changes, out of scope topics, and non-substantive comments were not included in the comment response effort.

Table 6-4
Overview of Comments by Category

Category	Overview
GRSG	Commenters asserted that the NTT report was inconsistent with the Federal Advisory Committee Act and is biased against oil and gas development, found the DEIS to not be fully consistent with the COT report, noted that the COT report should not be considered best available science, suggested modifications to GRSG alternatives, suggested new or additional literature for the BLM to consider in the FEIS, noted inaccuracies in the DEIS or requested additional information be included, suggested improvements to the impacts analysis for GRSG, wanted additional impacts to be included in the cumulative impacts section, and provided recommendations to strengthen or clarify mitigation measures.

Table 6-4
Overview of Comments by Category

Category	Overview
Livestock grazing	Commenters stated that the DEIS is contrary to the Taylor Grazing Act, suggested that more evidence is needed on whether livestock grazing is beneficial or detrimental to GRSG, requested that the plan include allotment-level data and analyses, wanted a more detailed impact analysis on grazing as a surface-disturbing activity and setting guidelines when grazing is average across pastures, and made suggestions on improving monitoring guidelines and standards.
NEPA	Commenters claimed there is no consistency between GRSG sub-region plans, that the BLM should work with local cooperating agencies for field office objectives, that the purpose and need was overly narrow, and that the DEIS failed to identify reasonably foreseeable future actions for renewable energy in the cumulative effects analysis. Commenters also suggested additional alternatives, wanted to know what information was not available for analysis, and wanted additional mitigation measures included in the FEIS, including triggers and measures of success.
Lands and realty	Commenters suggested additional management actions related to ROW avoidance and exclusion areas, wanted the FEIS to reference the USFWS 2012 Land-based Wind Energy Guidelines, wanted the BLM to provide rationale on ROW avoidance and exclusion areas, noted the BLM failed to include wind farm development on non-BLM-administered lands, and wanted more information on how continued road and transmission line development would impact GRSG habitat.
Leasable minerals	Commenters requested additional alternatives or clarification to the existing alternatives on RDFs, BMPs, well pad density, and valid existing rights. They also requested that mitigation for prospecting permits for nonenergy mineral development be described or defined.
FLPMA	Commenters wanted to see better inventories of public lands, resources, and values. Commenters also noted that the RMP/EIS is not consistent with local and state plans and policies.
LWC	Commenters wanted the BLM to add additional protections to LWCs and noted that the BLM failed to provide updated LWC inventories and the current ones are out of date.
Travel management	Commenters suggested modifications to the travel management alternatives, requested that ranching being included as an authorized off-road use, and wanted a timeframe for travel management planning and mitigation to be included in the preferred alternative.
Other laws	Commenters wanted to know why the 2011 GRSG IMs did not go through the NEPA process and claimed that the RMP does not conform to the Administrative Procedure Act and the USFWS Policy for Evaluating Conservation Efforts policy standard.

Table 6-4
Overview of Comments by Category

Category	Overview
Fire and fuels	Commenters suggested modifications to the alternatives related to fuels treatments, wanted to see grazing listed as a primary tool of wildfire prevention, and requested that mitigation and monitoring for post-fire management be included in the document.
Water resources	Commenters wanted to see measureable benchmarks for riparian areas, clarification on how PFC ratings would be used, a discussion of benefits to water developments in the cumulative impacts section, and additional information on compliance with MT water quality standards.
Disturbance cap	Commenters questioned why there was no disturbance cap percentage included in the preferred alternative.
Climate change	Commenters requested that additional factors be taken into consideration for climate change, such as a change in temperature and precipitation, and the impact of livestock grazing on climate resilience.
Invasive weeds	Commenters wanted to see a timeline for completing invasive weed objectives and questioned how the BLM would address the spread of certain invasive weeds in grazing areas.
Locatable minerals	Commenters suggested additional measures to protect GRSG near locatable mineral sites and other changes that should be made to the preferred alternative.
Noise	Commenters disagreed with the ambient noise levels used in the document, requested clarification on how noise measurements would be carried out, and found large exceptions to noise level limits to be unacceptable.
Saleable minerals	Commenters requested clarification on the alternatives on RDFs, pit restoration, and avoiding key wildlife areas.
Socioeconomics	Commenters noted that more comprehensive impacts analysis should be conducted to include wind energy, natural resources protection, and non-market values.
Vegetation - sagebrush	Commenters wanted to see a more specialized plan on how conifer encroachment would be handled and recommended additional methods to conduct conifer treatments.
ACECs	Commenter suggested additional alternatives that could be included in the plan and also claimed that additional ACECs would remove valuable grazing lands.
Recreation	Commenters wanted clarification on the impacts analysis for recreation, as well as how BLM OHV regulations would be incorporated into the plan.
Soil resources	Commenters were concerned that the impact of livestock grazing on soils was not adequately addressed.
Cultural resources	Commenters were concerned that the impact of livestock grazing on cultural resources was not adequately addressed.

Table 6-4
Overview of Comments by Category

Category	Overview
Fish and wildlife	Commenters wanted a specific section to be changed to become less general and to include additional scientific literature.
Predation	Commenters requested that a discussion on predation be included in the RMP/EIS.

6.5.4 Future Public Involvement

Public participation efforts will be ongoing throughout the remainder of the process of revising the RMPA and developing the EIS. The Proposed RMPA and Final EIS considered all substantive comments received during the 90-day public comment period for the Draft RMPA/EIS. Members of the public with standing will have the opportunity to protest the content of the Proposed RMPA/Final EIS during the specified 30-day protest period. The Record of Decision will be issued by the BLM following the Governor's Consistency Review and protest resolution.

Distribution and Availability of the Proposed RMPA and Final EIS

A Notice of Availability will be published in the *Federal Register* to notify the public of the availability of the Proposed RMPA/Final EIS. The Notice of Availability will also outline protest procedures during the 30-calendar day protest period. The Proposed RMPA/Final EIS will be available for downloading from the RMP website at http://blm.gov/f9kd. The Proposed RMPA/Final EIS will also be available for review at the LFO, Forest Service Offices in Stanford, Montana and White Sulphur Springs, Montana, the BLM Missouri Breaks Interpretive Center in Ft. Benton, Montana, and the NRCS office in Winnett, Montana. Press releases will be issued to notify the public of the Proposed RMPA/Final EIS availability

6.6 DISTRIBUTION OF THE PROPOSED RMPA/FINAL EIS

The Proposed RMPA/Final EIS has been sent to all parties expressing continued interest in the RMPA. Copies of the Proposed RMPA/Final EIS are also available for public review at the LFO, BLM Montana State Office in Billings, Forest Service Offices in Stanford, Montana and White Sulphur Springs, Montana, the BLM Missouri Breaks Interpretive Center in Ft. Benton, Montana, and the NRCS office in Winnett, Montana. The Proposed RMPA/Final EIS is also available electronically from the RMP website at http://blm.gov/f9kd.

Hard copies of the Proposed RMPA/Final EIS have been distributed to the following organizations, agencies, and individuals who requested them, or as required by regulation and policy.

Federal Government Agencies

- EPA

- Forest Service, Lewis and Clark National Forest
- USFWS
- USFWS, Charles M. Russell National Wildlife Refuge
- US Air Force
- Central Montana Resource Advisory Council
- NRCS

State Government Agencies

- MFWP
- Montana Department of Natural Resources and Conservation
- Governor Steve Bullock

Local Governments

- Chouteau County
- Fergus County
- Judith Basin County
- Meagher County
- Petroleum County

Tribal Governments and Committees

- Blackfeet Tribal Business Council
- Confederated Salish and Kootenai Tribes of the Flathead Reservation
- Chippewa-Cree Indians of the Rocky Boy's Reservation
- Crow Tribe of Montana
- Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
- Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
- Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation
- Nez Perce Tribe of Idaho
- Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho

Congressionals

- Senator Jon Tester
- Senator Steve Daines
- Representative Ryan Zinke

Nongovernmental Organizations and Businesses

- Petroleum County Conservation District
- Indian Butte CSGD
- Chain Buttes CSGD
- Winnett CSGD
- Crooked Creek CSGD
- Williams Coulee CSGD
- Grass Range CSGD
- Flatwillow CSGD
- Mark Good, Montana Wilderness Association
- Diane LaGrange, Bjork, Lindley, Little PC
- John Hammon
- Sherry Hornia
- Beth Kampschror, Friends of the Upper Missouri River Breaks National Monument
- Eric Molvar, Wild Earth Guardians

6.7 LIST OF PREPARERS

This RMPA/EIS was prepared by an interdisciplinary team of staff from the BLM and Environmental Management and Planning Solutions, Inc. As discussed in **Section 6.5.2**, staff from numerous federal, state, and local agencies, and nonprofit organizations contributed to developing the RMPA. The following is a list of people that prepared or contributed to the development of the RMPA and EIS.

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Chapter 7
References

CHAPTER 7
REFERENCES

References and personal communication for **Chapters 1-6** (not including **Section 5.3**, Greater Sage-Grouse) of the Lewiston Field Office Proposed RMPA/Final EIS are listed in **Section 7.1**. References and personal communication for the Greater Sage-Grouse cumulative effects analysis (**Section 5.3** in **Chapter 5**) are listed in **Section 7.2**.

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Glossary

GLOSSARY

2008 WAFWA Sage-grouse MOU. A memorandum of understanding (MOU) among Western Association of Fish and Wildlife Agencies, US Department of Agriculture, Forest Service, US Department of the Interior, Bureau of Land Management, US Department of the Interior, Fish and Wildlife Service, US Department of the Interior, Geological Survey, US Department of Agriculture, Natural Resources Conservation Service, and the US Department of Agriculture, Farm Service Agency. The purpose of the MOU is to provide for cooperation among the participating state and federal land, wildlife management and science agencies in the conservation and management of sage-grouse (*Centrocercus urophasianus*) sagebrush (*Artemisia* spp.) habitats and other sagebrush-dependent wildlife throughout the western United States and Canada and a commitment of all agencies to implement the 2006 WAFWA Conservation Strategy.

2011 Partnership MOU. A partnership agreement among the US Department of Agriculture, Natural Resources Conservation Service (NRCS), Forest Service, US Department of the Interior, Bureau of Land Management, and Fish and Wildlife Service in 2011. This memorandum of understanding (MOU) is for range management – to implement NRCS practices on adjacent federal properties.

Acquisition. Acquisition of lands can be pursued to facilitate various resource management objectives. Acquisitions, including easements, can be completed through exchange, Land and Water Conservation Fund purchases, donations, or receipts from the Federal Land Transaction Facilitation Act sales or exchanges.

Activity plan. A type of implementation plan (see *Implementation plan*); an activity plan usually describes multiple projects and applies best management practices to meet land use plan objectives. Examples of activity plans include

interdisciplinary management plans, habitat management plans, recreation area management plans, and grazing plans.

Actual use. The amount of animal unit months consumed by livestock based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks by the BLM.

Adaptive management. A type of natural resource management in which decisions are made as part of an ongoing science-based process. Adaptive management involves testing, monitoring, and evaluating applied strategies, and incorporating new knowledge into management approaches that are based on scientific findings and the needs of society. Results are used to modify management policy, strategies, and practices.

Administrative access. Motorized wheeled cross-country travel for lessees and permittees is limited to the administration of a federal lease or permit. Persons or corporations having such a permit or lease could perform administrative functions on public lands within the scope of the permit or lease; however, this would not preclude modifying permits or leases to limit motorized wheeled cross-country travel during further site-specific analysis to meet resource management objectives or standards and guidelines. *(Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota*, June 2003).

Air basin. A land area with generally similar meteorological and geographic conditions throughout. To the extent possible, air basin boundaries are defined along political boundary lines and include both the source and receptor areas.

Air pollution. The addition to the atmosphere of any material that may have a deleterious effect to life on our planet.

Allotment. An area of land in which one or more livestock operators graze their livestock. Allotments generally consist of BLM-administered lands but may include other federally managed, state-owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment management plan (AMP). A concisely written program of livestock grazing management, including supportive measures if required, designed to attain specific, multiple-use management goals in a grazing allotment. An AMP is prepared in consultation with the permittee(s), lessee(s), and other affected interests. Livestock grazing is considered in relation to other uses of the range and to renewable resources, such as watershed, vegetation, and wildlife. An AMP establishes seasons of use, the number of livestock to be permitted, the range improvements needed, and the grazing system.

Alluvial soil. A soil developing from recently deposited alluvium and exhibiting essentially no horizon development or modification of the recently deposited materials.

Alluvium. Clay, silt, sand, gravel, or other rock materials transported by moving water. Deposited in comparatively recent geologic time as sorted or semi-sorted sediment in rivers, floodplains, lakes, and shores, and in fans at the base of mountain slopes.

Ambient air quality. The state of the atmosphere at ground level as defined by the range of measured and/or predicted ambient concentrations of all significant pollutants for all averaging periods of interest.

Amendment. The process for considering or making changes in the terms, conditions, and decisions of approved Resource Management Plans or management framework plans. Usually only one or two issues are considered that involve only a portion of the planning area.

Animal unit month (AUM). The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

Anthropogenic disturbances. Features include but are not limited to paved highways, graded gravel roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills, agricultural conversion, homes, and mines.

Aquatic. Living or growing in or on the water.

Area of Critical Environmental Concern (ACEC). Special area designation established through the BLM's land use planning process (43 CFR, Part 1610.7-2) where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. The level of allowable use within an ACEC is established through the collaborative planning process. Designation of an ACEC allows for resource use limitations in order to protect identified resources or values.

Atmospheric deposition. Air pollution produced when acid chemicals are incorporated into rain, snow, fog, or mist and fall to the earth. Sometimes referred to as "acid rain" and comes from sulfur oxides and nitrogen oxides, products of burning coal and other fuels and from certain industrial processes. If the acid chemicals in the air are blown into the area where the weather is wet, the acids can fall to earth in the rain, snow, fog, or mist. In areas where the weather is dry, the acid chemicals may become incorporated into dust or smoke.

Attainment area. A geographic area in which levels of a criteria air pollutant meet the health-based National Ambient Air Quality Standard for that specific pollutant.

Authorized /authorized use. This is an activity (i.e., resource use) occurring on the public lands that is either explicitly or implicitly recognized and legalized by law or regulation. This term may refer to those activities occurring on the public lands for which the BLM, Forest Service, or other appropriate authority (e.g., Congress for RS 2477 rights-of-way, Federal Energy Regulatory Commission (FERC) for major, interstate rights-of-way), has issued a formal authorization document (e.g., livestock grazing lease/permit; right-of-way grant; coal lease; oil and gas permit to drill; etc.). Formally authorized uses typically involve some type of commercial activity, facility placement, or event. These formally authorized uses are often spatially or temporally limited. Unless constrained or bounded by statute, regulation, or an approved land use plan decision, legal activities involving public enjoyment and use of the public lands (e.g., hiking, camping, hunting, etc.) require no formal BLM or Forest Service authorization.

Avoidance/avoidance area. An area identified through resource management planning to be avoided but may be available for right-of-way location with special stipulations.

Baseline. The pre-existing condition of a defined area and/or resource that can be quantified by appropriate metrics. During environmental reviews, the baseline is considered the affected environment that exists at the time of the reviews initiation and is used to compare predictions of the effects of the proposed action or a reasonable range of alternatives.

Best Management Practices (BMPs). A suite of techniques that guide or may be applied to management actions to aide in achieving desired outcomes. BMPs are often developed in conjunction with land use plans, but they are not considered a planning decision unless the plans specify that they are mandatory.

Big game. Indigenous, ungulate (hoofed) wildlife species that are hunted, such as elk, deer, bison, bighorn sheep, and pronghorn antelope.

Biodiversity (biological diversity). The variety of life and its processes, and the interrelationships within and among various levels of ecological organization. Conservation, protection, and restoration of biological species and genetic diversity are needed to sustain the health of existing biological systems. Federal resource management agencies must examine the implications of management actions and development decisions on regional and local biodiversity.

Biologically Significant Unit (BSU). A BSU for the Lewistown Field Office Greater Sage-Grouse Resource Management Plan Amendment is the summary

of all the Priority Habitat Management Areas (PHMA) within a Greater Sage-Grouse population as delineated in the Conservation Objectives Team report.

Biological soil crust. A complex association between soil particles and cyanobacteria, algae, microfungi, lichens, and bryophytes that live within or atop the uppermost millimeters of soil.

BLM Sensitive Species. Those species that are not federally listed as endangered, threatened, or proposed under the Endangered Species Act, but that are designated by the BLM State Director under 16 USC 1536(a)(2) for special management consideration. By national policy, federally listed candidate species are automatically included as sensitive species. Sensitive species are managed so they will not need to be listed as proposed, threatened, or endangered under the Endangered Species Act.

Candidate species. Taxa for which the US Fish and Wildlife Service has sufficient information on their status and threats to propose the species for listing as endangered or threatened under the Endangered Species Act, but for which issuance of a proposed rule is currently precluded by higher priority listing actions. Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register (BLM Manual 6840, Special Status Species Manual).

Casual use. Casual use means activities ordinarily resulting in no or negligible disturbance of the public lands, resources, or improvements. For examples for rights of ways see 43 CFR, Part 2801.5. For examples for locatable minerals see 43 CFR, Part 3809.5.

Categorical exclusion. A category of actions (identified in agency guidance) that do not individually or cumulatively have a significant effect on the human environment, and for which neither an environmental assessment nor an environmental impact statement is required (40 CFR, Part 1508.4), but a limited form of NEPA analysis is performed.

Checkerboard. This term refers to a land ownership pattern of alternating sections of federal owned lands with private or State owned lands for 20 miles on either side of a land grant railroad (e.g., Union Pacific and Northern Pacific). On land status maps this alternating ownership is either delineated by color coding or alphabetic code resulting in a "checkerboard" visual pattern.

Chemical vegetation treatment. Application of herbicides to control invasive species/noxious weeds and/or unwanted vegetation. To meet resource objectives the preponderance of chemical treatments would be used in areas where cheatgrass or noxious weeds have invaded sagebrush steppe.

Clean Air Act of 1963 (as amended). Federal legislation governing air pollution control.

Clean Water Act of 1972 (as amended). Federal legislation governing water pollution control.

Climate change. Any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from:

- natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation); and
- human activities that change the atmosphere's composition (e.g., driving automobiles) and the land surface (e.g., deforestation, reforestation, urbanization, and desertification).

Closed area. Closed area means an area where off-road vehicle (aka OHV) use is prohibited. Use of off-road vehicles in closed areas may be allowed for certain reasons; however, such use shall be made only with the approval of the authorized officer. (43 CFR, Part 8340.0-5 (h)

Collaboration. A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands. Collaboration may take place with any interested parties, whether or not they are a cooperating agency.

Communication site. Sites that include broadcast types of uses (e.g., television, AM/FM radio, cable television, and broadcast translator) and non-broadcast uses (e.g., commercial or private mobile radio service, cellular telephone, microwave, local exchange network, and passive reflector).

Comprehensive trails and travel management. The proactive interdisciplinary planning; on-the-ground management and administration of travel networks (both motorized and non-motorized) to ensure public access, natural resources, and regulatory needs are considered. It consists of inventory, planning, designation, implementation, education, enforcement, monitoring, easement acquisition, mapping and signing, and other measures necessary to provide access to public lands for a wide variety of uses (including uses for recreational, traditional, casual, agricultural, commercial, educational, landing strips, and other purposes).

Condition class (fire regimes). Fire regime condition classes are a measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment

of exotic plant species, introduced insects or disease, or other management activities.

Conformance. A proposed action shall be specifically provided for in the land use plan or, if not specifically mentioned, shall be clearly consistent with the goals, objectives, or standards of the approved land use plan.

Conservation measures. Measures to conserve, enhance, and/or restore Greater Sage-Grouse habitat by reducing, eliminating, or minimizing threats to that habitat.

Conservation plan. The recorded decisions of a landowner or operator, cooperating with a conservation district, on how the landowner or operator plans, within practical limits, to use his/her land according to its capability and to treat it according to its needs for maintenance or improvement of the soil, water, animal, plant, and air resources.

Conservation strategy. A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM sensitive species or that have been determined by the US Fish and Wildlife Service or National Oceanographic and Atmospheric Administration-Fisheries to be federal candidates under the Endangered Species Act.

Controlled surface use (CSU). CSU is a category of moderate constraint stipulations that allows some use and occupancy of public land while protecting identified resources or values and is applicable to fluid mineral leasing and all activities associated with fluid mineral leasing (e.g., truck-mounted drilling and geophysical exploration equipment off designated routes, and construction of wells and/or pads). CSU areas are open to fluid mineral leasing but the stipulation allows the BLM to require special operational constraints, or the activity can be shifted more than 200 meters (656 feet) to protect the specified resource or value.

Cooperating agency. Assists the lead federal agency in developing an environmental assessment or environmental impact statement. These can be any agency with jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR, Part 1501.6). Any tribe or federal, state, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

Council on Environmental Quality. An advisory council to the President of the US established by the National Environmental Policy Act of 1969. It reviews federal programs to analyze and interpret environmental trends and information.

Criteria pollutant. The US Environmental Protection Agency uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards. The criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter and lead.

Crucial wildlife habitat. The environment essential to plant or animal biodiversity and conservation at the landscape level. Crucial habitats include, but are not limited to, biological core areas, severe winter range, winter concentration areas, reproduction areas, and movement corridors.

Cultural resources. Locations of human activity, occupation, or use. Cultural resources include archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and locations of traditional cultural or religious importance to specified social and/or cultural groups.

Cumulative effects. The direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action.

Decision area. Lands and federal mineral estate within the planning area that are administered by the BLM.

Deferred/deferred use. To set-aside, or postpone, a particular resource use(s) or activity(ies) on the public lands to a later time. Generally when this term is used the period of the deferral is specified. Deferments sometimes follow the sequence timeframe of associated serial actions (e.g., action B will be deferred until action A is completed).

Degraded vegetation. Areas where the plant community is not complete or is under threat. Examples include missing components such as perennial forbs or cool season grasses, weed infestations, or lack of regeneration of key species such as sagebrush or cottonwoods trees.

Designated roads and trails. Specific roads and trails identified by the BLM (or other agency) where some type of motorized/nonmotorized use is appropriate and allowed, either seasonally or year-long (H-1601-1, BLM Land Use Planning Handbook).

Desired future condition. For rangeland vegetation, the condition of rangeland resources on a landscape scale that meet management objectives. It is based on ecological, social, and economic considerations during the land planning process. It is usually expressed as ecological status or management status of vegetation (species composition, habitat diversity, and age and size class of species) and desired soil qualities (soil cover, erosion, and compaction). In a general context, desired future condition is a portrayal of the land or

resource conditions that are expected to result if goals and objectives are fully achieved.

Desired outcomes. A type of land use plan decision expressed as a goal or objective.

Direct impacts. Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place.

Directional drilling. A drilling technique whereby a well is deliberately deviated from the vertical in order to reach a particular part of the oil- or gas-bearing reservoir. Directional drilling technology enables the driller to steer the drill stem and bit to a desired bottom hole location. Directional wells initially are drilled straight down to a predetermined depth and then gradually curved at one or more different points to penetrate one or more given target reservoirs. This specialized drilling usually is accomplished with the use of a fluid-driven downhole motor, which turns the drill bit. Directional drilling also allows multiple production and injection wells to be drilled from a single surface location such as a gravel pad, thus minimizing cost and the surface impact of oil and gas drilling, production, and transportation facilities. It can be used to reach a target located beneath an environmentally sensitive area (Alaska Department of Natural Resources, Division of Oil and Gas 2009).

Disposal lands. Transfer of public land out of federal ownership to another party through sale, exchange, Recreation and Public Purposes Act of 1926, Desert Land Entry or other land law statutes.

Disruptive activities. Those public land resource uses/activities that are likely to alter the behavior, displace, or cause excessive stress to existing animal or human populations occurring at a specific location and/or time. In this context, disruptive activity(ies) refers to those actions that alter behavior or cause the displacement of individuals such that reproductive success is negatively affected, or an individual's physiological ability to cope with environmental stress is compromised. This term does not apply to the physical disturbance of the land surface, vegetation, or features. When administered as a land use restriction (e.g., *No Disruptive Activities*), this term may prohibit or limit the physical presence of sound above ambient levels, light beyond background levels, and/or the nearness of people and their activities. The term is commonly used in conjunction with protecting wildlife during crucial life stages (e.g., breeding, nesting, and birthing), although it could apply to any resource value on the public lands. The use of this land use restriction is not intended to prohibit all activity or authorized uses.

Diversity. The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

Easement. A right afforded a person or agency to make limited use of another's real property for access or other purposes.

Ecological emphasis area. The central and primary area of habitat for a population of a given species or group of species. These areas include corridors, which are strips of land that aid in the movement of species between disconnected emphasis areas of their natural habitat. Emphasis areas may be divided into smaller geographical zones.

Ecological Site. A distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

Emergency stabilization. Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. Emergency stabilization actions must be taken within one year following containment of a wildfire.

Endangered species. Any species that is in danger of extinction throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Manual). Under the Endangered Species Act in the US, "endangered" is the more-protected of the two categories. Designation as endangered (or threatened) is determined by US Fish and Wildlife Service as directed by the Endangered Species Act.

Endangered Species Act of 1973 (as amended). Designed to protect critically imperiled species from extinction as a consequence of economic growth and development untempered by adequate concern and conservation. The Act is administered by two federal agencies, US Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration. The purpose of the Act is to protect species and also the ecosystems upon which they depend (16 US Code 1531-1544).

Enhance. The improvement of habitat by increasing missing or modifying unsatisfactory components and/or attributes of the plant community to meet sage-grouse objectives.

Environmental assessment (EA). A concise public document prepared to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. It includes a brief discussion of the need for the proposal, alternatives considered, environmental impact of the proposed action and alternatives, and a list of agencies and individuals consulted.

Environmental impact statement (EIS). A detailed statement prepared by the responsible official in which a major federal action that significantly affects the quality of the human environment is described, alternatives to the proposed action are provided, and effects are analyzed (BLM National Management Strategy for OHV Use on Public Lands).

Evaluation (plan evaluation). The process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and National Environmental Policy Act of 1969 analysis are still valid and whether the plan is being implemented.

Exchange. A transaction whereby the federal government receives land or interests in land in exchange for other land or interests in land.

Exclusion area. An area identified through resource management planning that is not available for right-of-way location under any conditions.

Exemplary (vegetation). An area of vegetation that does not show signs of degradation and which may serve as a comparison to illustrate what the vegetation potential is for a given type of environment.

Existing routes. The roads, trails, or ways that are used by motorized vehicles (jeeps, all-terrain vehicles, motorized dirt bikes, etc.), mechanized uses (mountain bikes, wheelbarrows, game carts), pedestrians (hikers), and/or equestrians (horseback riders) and are, to the best of BLM's knowledge, in existence at the time of RMPA/EIS publication.

Exploration. Active drilling and geophysical operations to:

a. Determine the presence of the mineral resource; or

b. Determine the extent of the reservoir or mineral deposit.

Extensive Recreation Management Area (ERMA). Administrative units that require specific management consideration in order to address recreation use, demand, or Recreation and Visitor Services program investments. ERMAs are managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. ERMA management is commensurate and considered in context with the management of other resources and resource uses.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579, October 21, 1976, often referred to as the BLM's "Organic Act," which provides most of the BLM's legislated authority, direction policy, and basic management guidance.

Federal mineral estate. Subsurface mineral estate owned by the US and administered by the BLM. Federal mineral estate under BLM jurisdiction is

composed of mineral estate underlying BLM lands, privately owned lands, and state-owned lands

Fire frequency. A general term referring to the recurrence of fire in a given area over time.

Fire management plan (FMP). A plan that identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans including, but not limited to, preparedness plans, preplanned dispatch plans, and prevention plans. Fire Management Plans assure that wildland fire management goals and components are coordinated.

Fire Regime Condition Classification System (FRCCS). Measures the extent to which vegetation departs from reference conditions, or how the current vegetation differs from a particular reference condition.

Fire suppression. All work and activities connected with control and fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

Fluid minerals. Oil, gas, coal bed natural gas, and geothermal resources.

Forage. All browse and herbaceous foods that are available to grazing animals.

Forage base. The amount of vegetation available for wildlife and livestock use.

Fragile soils. Soils having a shallow depth to bedrock, minimal surface layer of organic material, textures that are more easily detached and eroded, or are on slopes over 35 percent.

Fugitive dust. Significant atmospheric dust arises from the mechanical disturbance of granular material exposed to the air. Dust generated from these open sources is termed "fugitive" because it is not discharged to the atmosphere in a confined flow stream. Common sources of fugitive dust include unpaved roads, agricultural tilling operations, aggregate storage piles, and heavy construction operations.

General sage-grouse habitat. Is occupied (seasonal or year-round) habitat outside of priority habitat. These areas have been identified by the BLM in coordination with respective state wildlife agencies.

Geographic Information System (GIS). A system of computer hardware, software, data, people, and applications that capture, store, edit, analyze, and display a potentially wide array of geospatial information.

Geophysical exploration. Efforts to locate deposits of oil and gas resources and to better define the subsurface.

Geothermal energy. Natural heat from within the Earth captured for production of electric power, space heating, or industrial steam.

Goal. A broad statement of a desired outcome; usually not quantifiable and may not have established timeframes for achievement.

Grandfathered right. The right to use in a non-conforming manner due to existence prior to the establishment of conforming terms and conditions.

Grant. Any authorization or instrument (e.g., easement, lease, license, or permit) BLM issues under Title V of the Federal Land Policy and Management Act (43 USC 1761 et. seq.), and those authorizations and instruments BLM and its predecessors issued for like purposes before October 21, 1976 under the existing statutory authority. It does not include authorizations issued under the Mineral Leasing Act (43 USC 185).

Grazing preference. Grazing preference or preference means a superior or priority position against others for the purpose of receiving a grazing permit or lease. This priority is attached to base property owned or controlled by the permittee or lessee. (43 CFR, Part 4100.0-5)

Grazing relinquishment. The voluntary and permanent surrender by an existing permittee or lessee, (with concurrence of any base property lienholder(s)), of their priority (preference) to use livestock forage allocation on public land as well as their permission to use this forage. Relinquishments do not require consent or approval by BLM. The BLM's receipt of a relinquishment is not a decision to close areas to livestock grazing.

Grazing retirement. Ending livestock grazing on a specific area of land.

Grazing system. Scheduled grazing use and non-use of an allotment to reach identified goals or objectives by improving the quality and quantity of vegetation. Include, but are not limited to, developing pastures, utilization levels, grazing rotations, timing and duration of use periods, and necessary range improvements.

Groundwater. Water held underground in soil or permeable rock, often feeding springs and wells.

Guidelines. Actions or management practices that may be used to achieve desired outcomes, sometimes expressed as BMPs. Guidelines may be identified during the land use planning process, but they are not considered a land use plan decision unless the plan specifies that they are mandatory. Guidelines for grazing administration must conform to 43 CFR, Part 4180.2.

Habitat. An environment that meets a specific set of physical, biological, temporal, or spatial characteristics that satisfy the requirements of a plant or animal species or group of species for part or all of their life cycle.

Hazardous material. A substance, pollutant, or contaminant that, due to its quantity, concentration, or physical or chemical characteristics, poses a potential hazard to human health and safety or to the environment if released into the workplace or the environment.

High voltage transmission lines. 100 kilovolt [kV] and over.

Impact. The effect, influence, alteration, or imprint caused by an action.

Impairment. The degree to which a distance of clear visibility is degraded by man-made pollutants.

Implementation decisions. Decisions that take action to implement land use planning; generally appealable to Interior Board of Land Appeals under 43 CFR, Part 4.410.

Implementation plan. An area or site-specific plan written to implement decisions made in a land use plan. Implementation plans include both activity plans and project plans.

Indicators. Factors that describe resource condition and change and can help the BLM determine trends over time.

Indirect impacts. Indirect impacts result from implementing an action or alternative but usually occur later in time or are removed in distance and are reasonably certain to occur.

Integrated Ranch Planning. A method for ranch planning that takes a holistic look at all elements of the ranching operations, including strategic and tactical planning, rather than approaching planning as several separate enterprises.

Intermittent stream. An intermittent stream is a stream that flows only at certain times of the year when it receives water from springs or from some surface sources such as melting snow in mountainous areas. During the dry season and throughout minor drought periods, these streams will not exhibit flow. Geomorphological characteristics are not well defined and are often inconspicuous. In the absence of external limiting factors, such as pollution and thermal modifications, species are scarce and adapted to the wet and dry conditions of the fluctuating water level.

Invertebrate. An animal lacking a backbone or spinal column, such as insects, snails, and worms. The group includes 97 percent of all animal species.

Key wildlife ecosystems. Specific areas within the geographic area occupied by a species in which are found those physical and biological features 1) essential to the conservation of the species, and 2) which may require special management considerations or protection.

Land health condition. A classification for land health which includes these categories: "Meeting Land Health Standard(s)" and "Not Meeting Land Health Standard(s)".

Land tenure adjustments. Land ownership or jurisdictional changes. To improve the manageability of the BLM-administered lands and their usefulness to the public, the BLM has numerous authorities for repositioning lands into a more consolidated pattern, disposing of lands, and entering into cooperative management agreements. These land pattern improvements are completed primarily through the use of land exchanges but also through land sales, through jurisdictional transfers to other agencies, and through the use of cooperative management agreements and leases.

Land treatment. All methods of artificial range improvement arid soil stabilization such as reseeding, brush control (chemical and mechanical), pitting, furrowing, water spreading, etc.

Land use allocation. The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions (H-1601-1, BLM Land Use Planning Handbook).

Land use plan. A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of Federal Land Policy and Management Act; an assimilation of land use plan level decisions developed through the planning process outlined in 43 CFR, Part 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and management framework plans (from H-1601-1, BLM Land Use Planning Handbook).

Land use plan decision. Establishes desired outcomes and actions needed to achieve them. Decisions are reached using the planning process in 43 CFR, Part 1600. When they are presented to the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to Interior Board of Land Appeals.

Large pipelines. 24 inches in width and over.

Late brood-rearing area. Habitat includes mesic sagebrush and mixed shrub communities, wet meadows, and riparian habitats as well as some agricultural lands (e.g., alfalfa fields).

Leasable minerals. Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. These include energy-related mineral resources such as oil, natural gas, coal, and geothermal, and some non-energy minerals, such as phosphate, sodium, potassium, and sulfur. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

Lease. Section 302 of the Federal Land Policy and Management Act of 1976 provides the BLM's authority to issue leases for the use, occupancy, and development of public lands. Leases are issued for purposes such as a commercial filming, advertising displays, commercial or noncommercial croplands, apiaries, livestock holding or feeding areas not related to grazing permits and leases, native or introduced species harvesting, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, ski resorts, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and nonirrigation facilities. The regulations establishing procedures for processing these leases and permits are found in 43 CFR, Part 2920.

Lease stipulation. A modification of the terms and conditions on a standard lease form at the time of the lease sale.

Lek. A traditional courtship display area attended by male sage-grouse in or adjacent to sagebrush dominated habitat. A lek is designated based on observations of two or more male sage-grouse engaged in courtship displays. Sub-dominant males may display on itinerant strutting areas during population peaks. Such areas usually fail to become established leks. Therefore, a site where less than five males are observed strutting should be confirmed active for two years before meeting the definition of a lek (Connelly et al 2000, Connelly et al. 2003, 2004). Each state may have a slightly different definition of lek, active lek, inactive lek, occupied lek, and unoccupied leks. Regional planning will use the appropriate definition provided by the state of interest.

> **Lek Complex.** A lek or group of leks within 2.5 km (1.5 mi) of each other between which male sage-grouse may interchange from one day to the next. Fidelity to leks has been well documented. Visits to multiple leks are most common among yearlings and less frequent for adult males, suggesting an age-related period of establishment (Connelly et al. 2004).
>
> **Active Lek.** Any lek that has been attended by male sage-grouse during the strutting season.
>
> **Inactive Lek.** Any lek where sufficient data suggests that there was no strutting activity throughout a strutting season. Absence of strutting grouse during a single visit is insufficient documentation to establish that

a lek is inactive. This designation requires documentation of either: 1) an absence of sage-grouses on the lek during at least two ground surveys separated by at least seven days. These surveys must be conducted under ideal conditions (April 1-May 7 (or other appropriate date based on local conditions), no precipitation, light or no wind, half-hour before sunrise to one hour after sunrise) or 2) a ground check of the exact known lek site late in the strutting season (after April 15) that fails to find any sign (tracks, droppings, feathers) of strutting activity. Data collected by aerial surveys should not be used to designate inactive status as the aerial survey may actually disrupt activities.

Occupied Lek. A lek that has been active during at least one strutting season within the prior 10 years.

Unoccupied Lek. A lek that has either been "destroyed" or "abandoned."

Destroyed Lek. A formerly active lek site and surrounding sagebrush habitat that has been destroyed and is no longer suitable for sage-grouse breeding.

Abandoned Lek. A lek in otherwise suitable habitat that has not been active during a period of 10 consecutive years. To be designated abandoned, a lek must be "inactive" (see above criteria) in at least four non-consecutive strutting seasons spanning the 10 years. The site of an "abandoned" lek should be surveyed at least once every 10 years to determine whether it has been re-occupied by sage-grouse.

Lentic. Pertaining to standing water, such as lakes and ponds.

Limited area: Means an area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: Numbers of vehicles; types of vehicles; time or season of vehicle use; permitted or licensed use only; use on existing roads and trails; use on designated roads and trails; and other restrictions. (43 CFR, Part 8340.0-5 (g)

Locatable minerals. Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Long-term effect. The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more.

Lotic. Pertaining to moving water, such as streams or rivers.

Management decision. A decision made by the BLM to manage public lands. Management decisions include both land use plan decisions and implementation decisions.

Master Development Plans. A set of information common to multiple planned wells, including drilling plans, Surface Use Plans of Operations, and plans for future production.

Mechanized transport. Any vehicle, device, or contrivance for moving people or material in or over land, water, snow, or air that has moving parts.

Mineral. Any naturally formed inorganic material, solid or fluid inorganic substance that can be extracted from the earth, any of various naturally occurring homogeneous substances (as stone, coal, salt, sulfur, sand, petroleum, water, or natural gas) obtained usually from the ground. Under federal laws, considered as locatable (subject to the general mining laws), leasable (subject to the Mineral Leasing Act of 1920), and salable (subject to the Materials Act of 1947).

Mineral entry. The filing of a claim on public land to obtain the right to any locatable minerals it may contain.

Mineral estate. The ownership of minerals, including rights necessary for access, exploration, development, mining, ore dressing, and transportation operations.

Mineralize. The process where a substance is converted from an organic substance to an inorganic substance.

Mineral materials. Common varieties of mineral materials such as soil, sand and gravel, stone, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be acquired under the Materials Act of 1947, as amended.

Mining claim. A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, millsite, and tunnel site.

Mining Law of 1872. Provides for claiming and gaining title to locatable minerals on public lands. Also referred to as the "General Mining Laws" or "Mining Laws."

Mitigation. Includes specific means, measures or practices that could reduce, avoid, or eliminate adverse impacts. Mitigation can include avoiding the impact altogether by not taking a certain action or parts of an action, minimizing the

impact by limiting the degree of magnitude of the action and its implementation, rectifying the impact by repairing, rehabilitation, or restoring the affected environment, reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and compensating for the impact by replacing or providing substitute resources or environments.

Modification. A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Monitoring (plan monitoring). The process of tracking the implementation of land use plan decisions and collecting and assessing data necessary to evaluate the effectiveness of land use planning decisions.

Motorized vehicles or uses. Vehicles that are motorized, including but not limited to jeeps, all-terrain vehicles (all-terrain vehicles, such as four-wheelers and three-wheelers), trail motorcycles or dirt bikes, and aircrafts.

Multiple-use. The management of the public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (Federal Land Policy and Management Act) (BLM Manual 6840, Special Status Species Manual).

Municipal watershed. A watershed area that provides water for use by a municipality as defined by the community and accepted by the State.

National Environmental Policy Act of 1969 (NEPA). Public Law 91-190. Establishes environmental policy for the nation. Among other items, NEPA requires federal agencies to consider environmental values in decision-making processes.

National Historic Trail. A congressionally designated trail that is an extended, long-distance trail, not necessarily managed as continuous, that follows as closely as possible and practicable the original trails or routes of

travel of national historic significance. The purpose of a National Historic Trail is the identification and protection of the historic route and the historic remnants and artifacts for public use and enjoyment. A National Historic Trail is managed in a manner to protect the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail (BLM Manual 6280, Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation).

Native vegetation. Plant species which were found here prior to European settlement, and consequently are in balance with these ecosystems because they have well developed parasites, predators, and pollinators.

Natural processes. Fire, drought, insect and disease outbreaks, flooding, and other events which existed prior to European settlement, and shaped vegetation composition and structure.

Net Conservation Gain. The intent of the Lewistown Field Office Greater Sage-Grouse Proposed Plan Amendment is to provide a net conservation gain to Greater Sage-Grouse. To do so, in undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation within priority habitat (core population areas and core population connectivity corridors), the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.

Non-energy leasable minerals. Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. Non-energy minerals include resources such as phosphate, sodium, potassium, and sulfur.

Nonfunctional condition. Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate energies associated with flow events, and thus are not reducing erosion, improving water quality, etc.

No surface occupancy (NSO). A major constraint where use or occupancy of the land surface for fluid mineral exploration or development and all activities associated with fluid mineral leasing (e.g., truck-mounted drilling and geophysical exploration equipment off designated routes, and construction of wells and/or pads) are prohibited to protect identified resource values. Areas identified as NSO are open to fluid mineral leasing, but surface occupancy or surface-disturbing activities associated with fluid mineral leasing cannot be conducted on the surface of the land. Access to fluid mineral deposits would require horizontal drilling from outside the boundaries of the NSO area.

Noxious weeds. A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the US.

Objective. A description of a desired outcome for a resource. Objectives can be quantified and measured and, where possible, have established timeframes for achievement.

Occupancy. Occupancy means full- or part-time residence on public lands. It also means activities that involve residence; the construction, presence, or maintenance of temporary or permanent structures that may be used for such purposes; or the use of a watchman or caretaker for the purpose of monitoring activities. Residence or structures include, but are not limited to, barriers to access, fences, tents, motor homes, trailers, cabins, houses, buildings, and storage of equipment or supplies (43 CFR, Part 3715.0-5).

Off-highway vehicle (OHV) (off-road vehicle). Any motorized vehicle capable of, or designated for travel on or immediately over land, water or other natural terrain, excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense emergencies (43 CFR, Part 8340.0-5).

Open. Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR, Part 8340.0-5 defines the specific meaning of "open" as it relates to OHV use.

Ozone. A faint blue gas produced in the atmosphere from chemical reactions of burning coal, gasoline, and other fuels and chemicals found in products such as solvents, paints, and hairsprays.

Paleontological resources. The physical remains or other physical evidence of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are important for correlating and dating rock strata and for understanding past environments, environmental change, and the evolution of life.

Particulate matter (PM). One of the six "criteria" pollutants for which the US Environmental Protection Agency established National Ambient Air Quality Standards. Particulate matter is defined as two categories, fine particulate, with an aerodynamic diameter of 10 micrometers (PM_{10}) or less, and fine particulate with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$).

Perennial stream. A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

Permitted use. The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and expressed in animal unit months (43 CFR, Part 4100.0-5).

Permittee. A person or company permitted to graze livestock on public land.

Physiography. The study and classification of the surface features of the earth.

Plan of Operations. A Plan of Operations is required for all mining activity exploration greater than 5 acres or surface disturbance greater than casual use on certain special category lands. Special category lands are described under 43 CFR, Part 3809.11(c) and include such lands as designated Areas of Critical Environmental Concern, lands within the National Wilderness Preservation System, and areas closed to off-road vehicles, among others. In addition, a Plan of Operations is required for activity greater than casual use on lands patented under the Stock Raising Homestead Act with federal minerals where the operator does not have the written consent of the surface owner (43 CFR, Part 3814). The Plan of Operations needs to be filed in the BLM field office with jurisdiction over the land involved. The Plan of Operations does not need to be on a particular form but must address the information required by 43 CFR, Part 3809.401(b).

Planning area. The geographical area for which sage-grouse management plan amendments are developed and maintained. The LFO Greater Sage-Grouse RMPA/EIS planning area boundary defines the area assessed in this RMPA. The planning area encompasses 1,207,994 acres in Choteau, Fergus, Judith Basin, Meagher, and Petroleum Counties in central Montana. The BLM administers 593,995 acres (about 4.9 percent) of the planning area and 1,509,263 acres of federal mineral estate (including BLM-administered lands).

Planning criteria. The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision making, analysis, and data collection during planning. Planning criteria streamlines and simplifies the resource management planning actions.

Planning issues. Concerns, conflicts, and problems with the existing management of public lands. Frequently, issues are based on how land uses affect resources. Some issues are concerned with how land uses can affect other land uses, or how the protection of resources affects land uses.

Policy. This is a statement of guiding principles, or procedures, designed and intended to influence planning decisions, operating actions, or other affairs of the BLM. Policies are established interpretations of legislation, executive orders, regulations, or other presidential, secretarial, or management directives.

Prescribed fire. A wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which National Environmental Policy Act requirements (where applicable) have been met prior to ignition.

Primitive road. A linear route managed for use by four-wheel drive or high-clearance vehicles. Primitive roads do not normally meet any BLM road design standards.

Primitive route. Any transportation linear feature located within areas that have been identified as having wilderness characteristics and not meeting the wilderness inventory road definition (BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands).

Priority sage-grouse habitat. Areas that have been identified as having the highest conservation value to maintaining sustainable sage-grouse populations. These areas would include breeding, late brood-rearing, and winter concentration areas. These areas have been identified by the BLM in coordination with respective state wildlife agencies.

Proper functioning condition. A term describing stream health that is based on the presence of adequate vegetation, landform and debris to dissipate energy, reduce erosion and improve water quality.

Public domain. The term applied to any or all of those areas of land ceded to the Federal Government by the Original States and to such other lands as were later acquired by treaty, purchase or cession, and are disposed of only under the authority of Congress.

Public land. Land or interest in land owned by the US and administered by the Secretary of the Interior through the BLM without regard to how the US acquired ownership, except lands located on the Outer Continental Shelf and land held for the benefit of Indians, Aleuts, and Eskimos (H-1601-1, BLM Land Use Planning Handbook).

Public Lands Not Designated as Recreation Management Areas. All lands not designated as a Special Recreation Management Area or Extensive Recreation Management Area.

Range Improvement. The term range improvement means any activity, structure or program on or relating to rangelands which is designed to improve production of forage; change vegetative composition; control patterns of use; provide water; stabilize soil and water conditions; and provide habitat for livestock and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical means to accomplish the desired results.

Range improvement project. An authorized physical modification or treatment which is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. This definition includes, but is not limited to: structures, treatment projects and use of mechanical devices, or modifications achieved through mechanical means.

Raptor. Bird of prey with sharp talons and strongly curved beaks, such as hawks, owls, falcons, and eagles.

Reasonable foreseeable development scenario. The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

Reclamation. The suite of actions taken within an area affected by human disturbance, the outcome of which is intended to change the condition of the disturbed area to meet pre-determined objectives and/or make it acceptable for certain defined resources (e.g., wildlife habitat, grazing, and ecosystem function).

Recreation management area. Includes Special Recreation Management Areas (SRMAs) and Extensive Recreation Management Areas (ERMAs); see SRMA and ERMA definitions.

Recreation experiences. Psychological outcomes realized either by recreation-tourism participants as a direct result of their on-site leisure engagements and recreation-tourism activity participation or by nonparticipating community residents as a result of their interaction with visitors and guests within their community or interaction with the BLM and other public and private recreation-tourism providers and their actions.

Recreation opportunities. Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.

Recreation settings. The collective distinguishing attributes of landscapes that influence and sometimes actually determine what kinds of recreation opportunities are produced.

Reference state. The reference state is the state where the functional capacities represented by soil/site stability, hydrologic function, and biotic integrity are performing at an optimum level under the natural disturbance regime. This state usually includes, but is not limited to, what is often referred to as the potential natural plant community.

Rehabilitate. Returning disturbed lands as near to its predisturbed condition as is reasonably practical or as specified in approved permits.

Renewable Energy. Energy resources that constantly renew themselves or that are regarded as practically inexhaustible. These include solar, wind, geothermal, hydro, and biomass. Although particular geothermal formations can be depleted, the natural heat in the Earth is a virtually inexhaustible reserve of potential energy.

Required Design Features (RDF). RDFs are required for certain activities in all Greater Sage-Grouse habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for Greater Sage-Grouse or its habitat; and
- A specific RDF will provide no additional protection to Greater Sage-Grouse or its habitat.

Reserve common allotment. An area which is designated in the land use plan as available for livestock grazing but reserved as an area available for use as an alternative to grazing in another allotment in order to facilitate rangeland restoration treatments and recovery from natural disturbances such as drought or wildfire. The reserve common allotment would provide needed flexibility that would help the agency apply temporary rest from grazing where vegetation treatments and/or management would be most effective.

Resource management plan (RMP). A land use plan as prescribed by the Federal Land Policy and Management Act that establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, objectives, and actions to be achieved.

Restore/restoration. Implementation of a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long term. The long-term

goal is to create functional, high quality habitat that is occupied by sage-grouse. Short-term goal may be to restore the landform, soils and hydrology and increase the percentage of preferred vegetation, seeding of desired species, or treatment of undesired species.

Restriction/restricted use. A limitation or constraint on public land uses and operations. Restrictions can be of any kind, but most commonly apply to certain types of vehicle use, temporal and/or spatial constraints, or certain authorizations.

Revegetate/revegetation. The process of putting vegetation back in an area where vegetation previously existed, which may or may not simulate natural conditions.

Revision. The process of completely rewriting the land use plan due to changes in the planning area affecting major portions of the plan or the entire plan.

Right-of-way (ROW). Public lands the BLM authorizes a holder to use or occupy under a grant (i.e., road, pipeline, power line, and fiber optic line).

Right-of-way avoidance area. An area identified through resource management planning to be avoided but may be available for ROW location with special stipulations.

Right-of-way exclusion area. An area identified through resource management planning that is not available for ROW location under any conditions.

Riparian area. A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

Riparian zone. An area one-quarter mile wide encompassing riparian and adjacent vegetation.

Road. A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Rotation. Grazing rotation between pastures in the allotment for the permitted time.

Routes. Multiple roads, trails and primitive roads; a group or set of roads, trails, and primitive roads that represents less than 100 percent of the BLM transportation system. Generically, components of the transportation system are described as "routes."

Sagebrush Focal Areas. Areas identified by the US Fish and Wildlife Service that represent recognized "strongholds" for Greater Sage-Grouse that have been noted and referenced by the conservation community as having the highest densities of Greater Sage-Grouse and other criteria important for the persistence of Greater Sage-Grouse.

Sale (public land). A method of land disposal pursuant to Section 203 of the Federal Land Policy and Management Act, whereby the US receives a fair-market payment for the transfer of land from federal ownership. Public lands determined suitable for sale are offered on the initiative of the BLM. Lands suitable for sale must be identified in the resource management plan (RMP). Any lands to be disposed of by sale that are not identified in the current RMP, or that meet the disposal criteria identified in the RMP, require a plan amendment before a sale can occur.

Saturated soils. Occur when the infiltration capacity of the soil is exceeded from above due to rainfall or snowmelt runoff. Soils can also become saturated from groundwater inputs.

Scoping process. An early and open public participation process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

Season of use. The time during which livestock grazing is permitted on a given range area, as specified in the grazing lease.

Seeding. Seeding is a vegetation treatment that includes the application of grass, forb, or shrub seed, either aerially or from the ground. In areas of gentle terrain, ground applications of seed are often accomplished with a rangeland drill. Seeding allows the establishment of native species or placeholder species and restoration of disturbed areas to a perennial-dominated cover type, thereby decreasing the risk of subsequent invasion by exotic plant species. Seeding would be used primarily as a follow-up treatment in areas where disturbance or the previously described treatments have removed exotic plant species and their residue.

Short-term effect. The effect occurs only during or immediately after implementation of the alternative.

Special Recreation Management Area (SRMA). An administrative public lands unit identified in land use plans where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their

unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.

Special Recreation Permit (SRP). Authorization that allows for recreational uses of public lands and related waters. Issued as a means to control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors. Commercial SRPs are also issued as a mechanism to provide a fair return for the commercial use of public lands.

Special status species. BLM special status species are: (1) species listed, candidate, or proposed for listing under the Endangered Species Act; and (2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the Endangered Species Act that are designated as BLM sensitive by the BLM State Director(s). All federally listed candidate species, proposed species, and delisted species in the five years following delisting are conserved as BLM sensitive species.

Split estate. This is the circumstance where the surface of a particular parcel of land is owned by a different party than the minerals underlying the surface. Split estates may have any combination of surface/subsurface owners: federal/state; federal/private; state/private; or percentage ownerships. When referring to the split estate ownership on a particular parcel of land, it is generally necessary to describe the surface/subsurface ownership pattern of the parcel.

Stabilize. The process of stopping further damage from occurring.

Standard. A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (e.g., land health standards). To be expressed as a desired outcome (goal).

Standard lease terms and conditions. Areas may be open to leasing with no specific management decisions defined in a Resource Management Plan; however, these areas are subject to lease terms and conditions as defined on the lease form (Form 3100-11, Offer to Lease and Lease for Oil and Gas; and Form 3200-24, Offer to Lease and Lease for Geothermal Resources).

State. A state is comprised of an integrated soil and vegetation unit having one or more biological communities that occur on a particular ecological site and that are functionally similar with respect to the three attributes (soil/site stability, hydrologic function, and biotic integrity) under natural disturbance regimes.

Stipulation (general). A term or condition in an agreement or contract.

Stipulation (oil and gas). A provision that modifies standard oil and gas lease terms and conditions in order to protect other resource values or land uses and is attached to and made a part of the lease. Typical lease stipulations include No Surface Occupancy (NSO), Timing Limitations (TL), and Controlled Surface Use (CSU). Lease stipulations are developed through the land use planning (RMP) process.

Surface disturbance. Suitable habitat is considered disturbed when it is removed and unavailable for immediate sage-grouse use.

a. Long-term removal occurs when habitat is physically removed through activities that replace suitable habitat with long term occupancy of unsuitable habitat such as a road, power line, well pad or active mine. Long-term removal may also result from any activities that cause soil mixing, soil removal, and exposure of the soil to erosive processes.

b. Short–term removal occurs when vegetation is removed in small areas, but restored to suitable habitat within a few years (< 5) of disturbance, such as a successfully reclaimed pipeline, or successfully reclaimed drill hole or pit.

c. Suitable habitat rendered unusable due to numerous anthropogenic disturbances

d. Anthropogenic surface disturbance are surface disturbances meeting the above definitions which result from human activities.

Surface disturbing activities. An action that alters the vegetation, surface/near surface soil resources, and/or surface geologic features, beyond natural site conditions and on a scale that affects other public land values. Examples of surface disturbing activities may include: operation of heavy equipment to construct well pads, roads, pits and reservoirs; installation of pipelines and power lines; and the conduct of several types of vegetation treatments (e.g., prescribed fire). Surface disturbing activities may be either authorized or prohibited.

Surface use(s). These are all the various activities that may be present on the surface or near-surface (e.g., pipelines), of the public lands. It does <u>not</u> refer to those subterranean activities (e.g., underground mining, etc.) occurring on the public lands or federal mineral estate. When administered as a use restriction (e.g., *No Surface Use [NSU]*), this phrase prohibits all but specified resource uses and activities in a certain area to protect particular sensitive resource values and property. This designation typically applies to small acreage sensitive resource sites (e.g., plant community study exclosure), and/or administrative sites (e.g., government ware-yard) where only authorized agency personnel are admitted.

Sustained yield. The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple uses.

Technically/Economically Feasible. Actions that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. It is the BLM's sole responsibility to determine what actions are technically and economically feasible. The BLM will consider whether implementation of the proposed action is likely given past and current practice and technology; this consideration does not necessarily require a cost-benefit analysis or speculation about an applicant's costs and profit" (Modified from the CEQ's 40 Most Asked Questions and BLM NEPA Handbook, Section 6.6.3).

Temporary/temporary use. This term is used as the opposite of the term permanent/ permanent use. It is a relative term and has to be considered in the context of the resource values affected and the nature of the resource use(s)/activity(ies) taking place. Generally, a temporary activity is considered to be one that is not fixed in place and is of short duration.

Terrestrial. Living or growing in or on the land.

Threatened species. Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Management). Under the Endangered Species Act in the US, "threatened" is the lesser-protected of the two categories. Designation as threatened (or endangered) is determined by US Fish and Wildlife Service as directed by the Endangered Species Act.

Timber. Standing trees, downed trees, or logs which are capable of being measured in board feet.

Timing Limitation (TL). The TL stipulation, a moderate constraint, is applicable to fluid mineral leasing, all activities associated with fluid mineral leasing (e.g., truck-mounted drilling and geophysical exploration equipment off designated routes, and construction of wells and/or pads), and other surface-disturbing activities (i.e., those not related to fluid mineral leasing). Areas identified for TL are closed to fluid mineral exploration and development, surface-disturbing activities, and intensive human activity during identified time frames. This stipulation does not apply to operation and basic maintenance activities, including associated vehicle travel, unless otherwise specified. Construction, drilling, completions, and other operations considered to be intensive in nature are not allowed. Intensive maintenance, such as workovers on wells, is not permitted. TLs can overlap spatially with no surface occupancy and controlled surface use, as well as with areas that have no other restrictions.

Total dissolved solids. Salt, or an aggregate of carbonates, bicarbonates, chlorides, sulfates, phosphates, and nitrates of calcium, magnesium, manganese, sodium, potassium, and other cations that form salts.

Total maximum daily load (TMDL). An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Trail. A linear route managed for human-power (e.g., hiking or bicycling), stock (e.g., equestrian), or off-highway vehicle forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Transition. A shift between two states. Transitions are not reversible by simply altering the intensity or direction of factors that produced the change. Instead, they require new inputs such as revegetation or shrub removal. Practices, such as these, that accelerate succession are often expensive to apply.

Transmission. The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transportation system. The sum of the BLM's recognized inventory of linear features (roads, primitive roads, and trails) formally recognized, designated, and approved as part of the BLM's transportation system.

Travel management areas. Polygons or delineated areas where a rational approach has been taken to classify areas open, closed or limited, and have identified and/or designated a network of roads, trails, ways, landing strips, and other routes that provide for public access and travel across the planning area. All designated travel routes within travel management areas should have a clearly identified need and purpose as well as clearly defined activity types, modes of travel, and seasons or timeframes for allowable access or other limitations (BLM Handbook H-1601-1 Land Use Planning Handbook).

Trespass. Any unauthorized use of public land.

Tribal interests. Native American or Native Alaskan economic rights such as Indian trust assets, resource uses and access guaranteed by treaty rights, and subsistence uses.

Understory. That portion of a plant community growing underneath the taller plants on the site.

Unitization. Operation of multiple leases as a single lease under a single operator.

Unitized area. A group of contiguous oil and gas lease holdings where the lessee holds an agreement with the federal government so that exploration, drilling, and production of the resource proceeds in the most efficient and economical manner possible.

Unnecessary or undue degradation. Unnecessary or undue degradation means conditions, activities, or practices that (43 CFR, Part 3809.5):

> (1) Fail to comply with one or more of the following: the performance standards in § 3809.420, the terms and conditions of an approved plan of operations, operations described in a complete notice, and other federal and state laws related to environmental protection and protection of cultural resources;
>
> (2) Are not "reasonably incident" to prospecting, mining, or processing operations as defined in § 3715. 0-5 of this chapter; or
>
> (3) Fail to attain a stated level of protection or reclamation required by specific laws in areas such as the California Desert Conservation Area, Wild and Scenic Rivers, BLM-administered portions of the National Wilderness System, and BLM-administered National Monuments and National Conservation Areas.

Utility corridor. Tract of land varying in width forming passageway through which various commodities such as oil, gas, and electricity are transported.

Valid existing rights. Documented, legal rights or interests in the land that allow a person or entity to use said land for a specific purpose and that are still in effect. Such rights include but are not limited to fee title ownership, mineral rights, rights-of-way, easements, permits, and licenses. Such rights may have been reserved, acquired, leased, granted, permitted, or otherwise authorized over time.

Vegetation manipulation. Planned alteration of vegetation communities through use of mechanical, chemical, seeding, and/or prescribed fire or managed fire to achieve desired resource objectives.

Vegetation treatments. Management practices which change the vegetation structure to a different stage of development. Vegetation treatment methods include managed fire, prescribed fire, chemical, mechanical, and seeding.

Vegetation type. A plant community with immediately distinguishable characteristics based upon and named after the apparent dominant plant species.

Visibility (air quality). A measure of the ability to see and identify objects at different distances.

Visitor day. Twelve visitor hours that may be aggregated by one or more persons in single or multiple visits.

Visual resources. The visible physical features on a landscape, (topography, water, vegetation, animals, structures, and other features) that comprise die scenery of the area.

Watershed. Topographical region or area delineated by water draining to a particular watercourse or body of water.

West Nile virus. A virus that is found in temperate and tropical regions of the world and most commonly transmitted by mosquitos. West Nile virus can cause flu-like symptoms in humans and can be lethal to birds, including sage-grouse.

Wild and Scenic Study River. Rivers identified for study by Congress under Section 5(a) of the Wild and Scenic Rivers Act or identified for study by the Secretary of Agriculture or the Secretary of the Interior under Section 5(d)(1) of the Wild and Scenic Rivers Act. These rivers will be studied under the provisions of Section 4 of the Wild and Scenic Rivers Act (BLM Manual 6400, Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management).

> **Eligible river.** A river or river segment found to meet criteria found in Sections 1(b) and 2(b) of the Wild and Scenic Rivers Act of being free flowing and possessing one or more outstandingly remarkable value.
>
> **Suitable river.** An eligible river segment found through administrative study to meet the criteria for designation as a component of the National System, as specified in Section 4(a) of the Wild and Scenic Rivers Act.

Wildcat well. An exploratory oil well drilled in land not known to be an oil field.

Wilderness. A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or

historic value. The definition is contained in Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).

Wilderness characteristics. Wilderness characteristics attributes include the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation. They may also include supplemental values. Lands with wilderness characteristics are those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in section 2(c) of the Wilderness Act.

Wilderness Study Area (WSA). A designation made through the land use planning process of a roadless area found to have wilderness characteristics, as described in Section 2(c) of the Wilderness Act of 1964.

Wildfire: Unplanned ignitions or prescribed fires that are declared wildfires. Wildfires may be managed to meet one or more objectives as specified in the Resource Management Plan and these objectives can change as the fire spreads across the landscape (NWCG #024-2010 Memorandum, April 30, 2010).

Wildland fire. Wildland fire is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:

- Wildfires: Unplanned ignitions or prescribed fires that are declared wildfires.
- Prescribed fires: Planned ignitions.

Wildland fire use. *A term no longer used; these fires are now included within the "Wildfire" definition).*

Wildland-urban interface (WUI). The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Withdrawal. An action that restricts the use of public land and segregates the land from the operation of some or all of the public land and mineral laws. Withdrawals are also used to transfer jurisdiction of management of public lands to other federal agencies.

Winter concentration areas. Sage-grouse winter habitats which are occupied annually by sage-grouse and provide sufficient sagebrush cover and food to support birds throughout the entire winter (especially periods with above average snow cover). Many of these areas support several different breeding populations of sage-grouse. Sage-grouse typically show high fidelity for these areas, and loss or fragmentation can result in significant population impacts.

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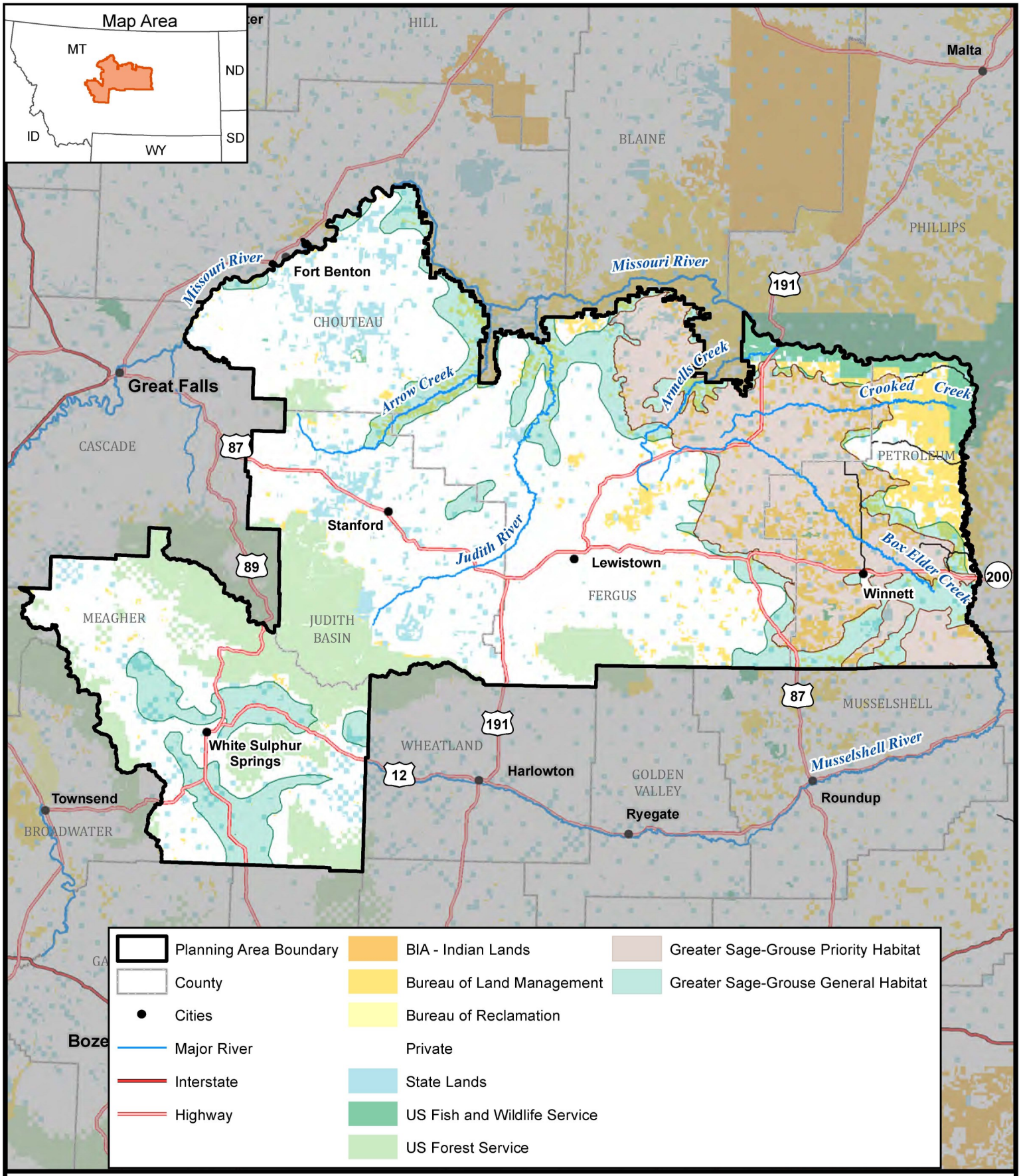

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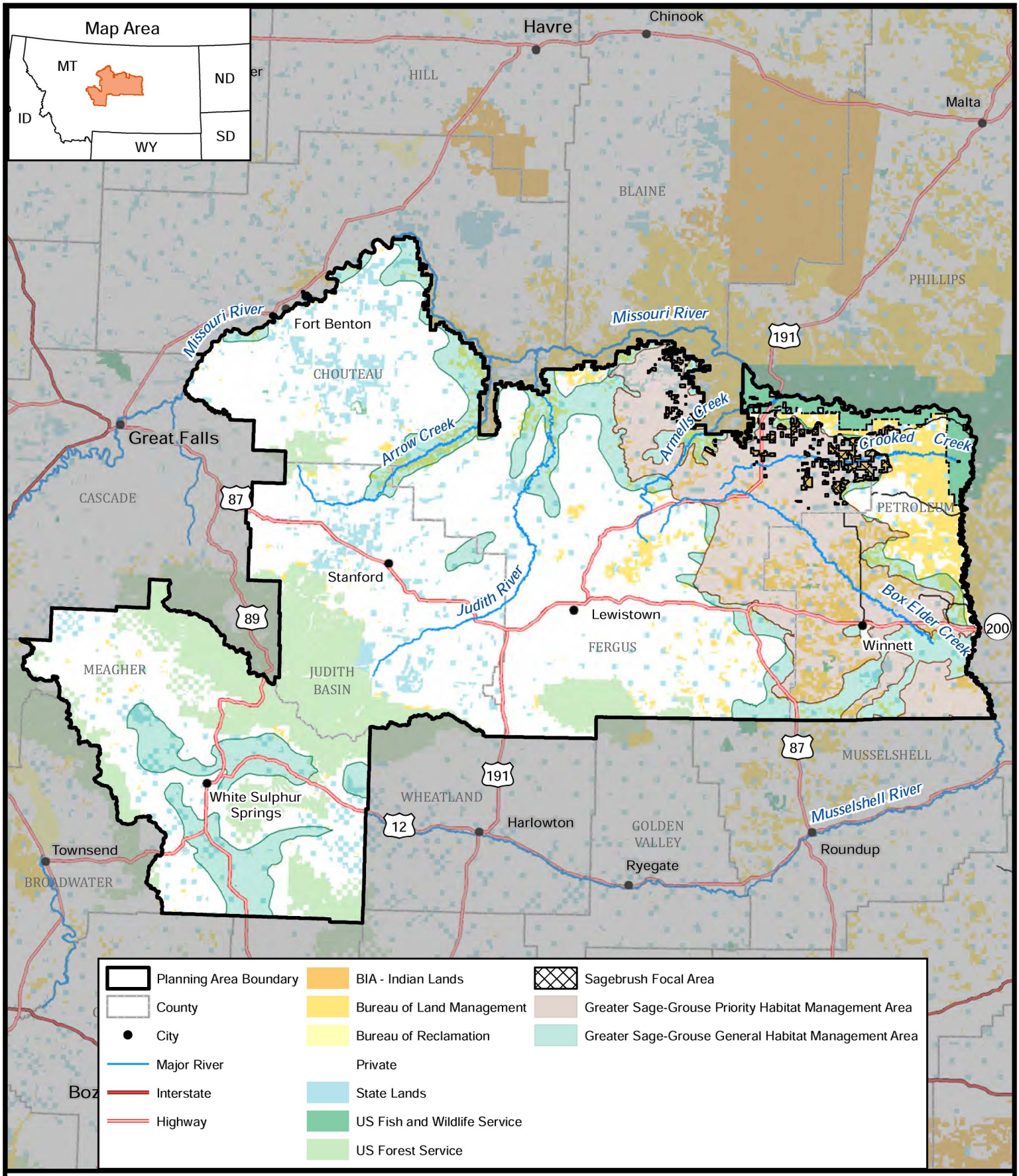
Project Planning Area

Source: MT FWP 2011

Lewistown Field Office Greater Sage-Grouse EIS

Map Date: 4/23/2015

Figure 1-1



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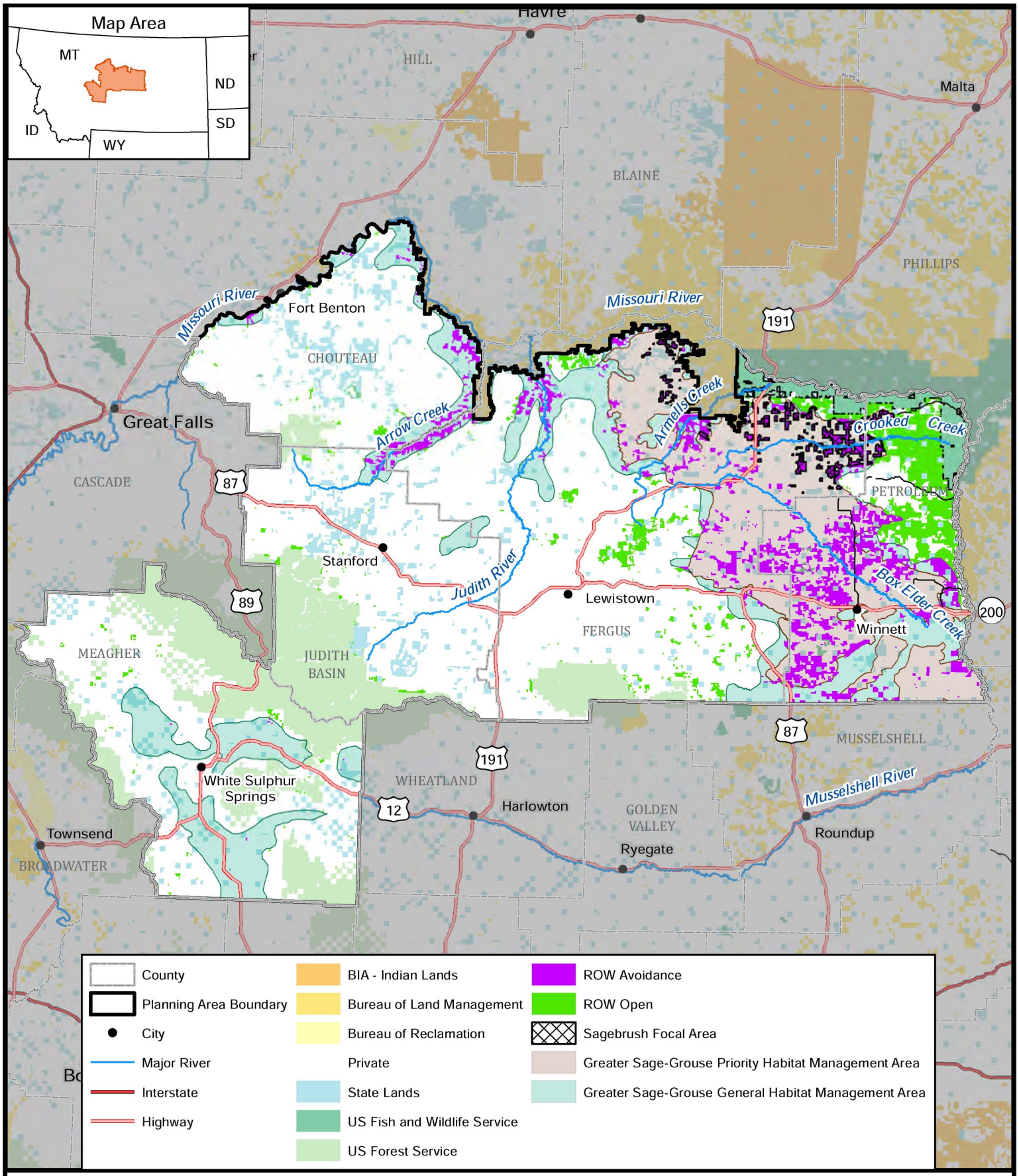
Sagebrush Focal Area - Proposed Plan

Source: BLM 2012a

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 1



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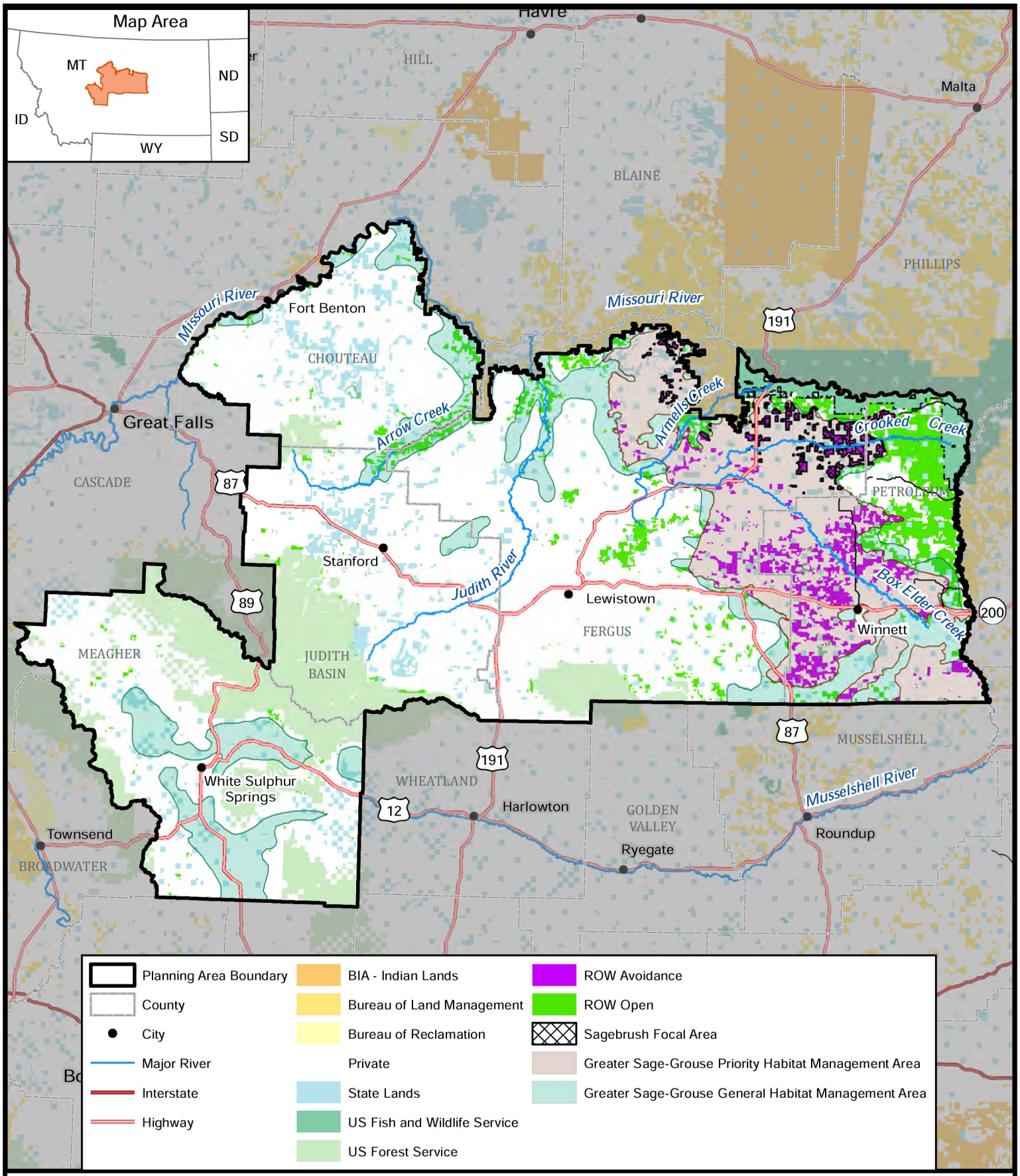
Major Rights-of-Way Avoidance Areas - Proposed Plan

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 2



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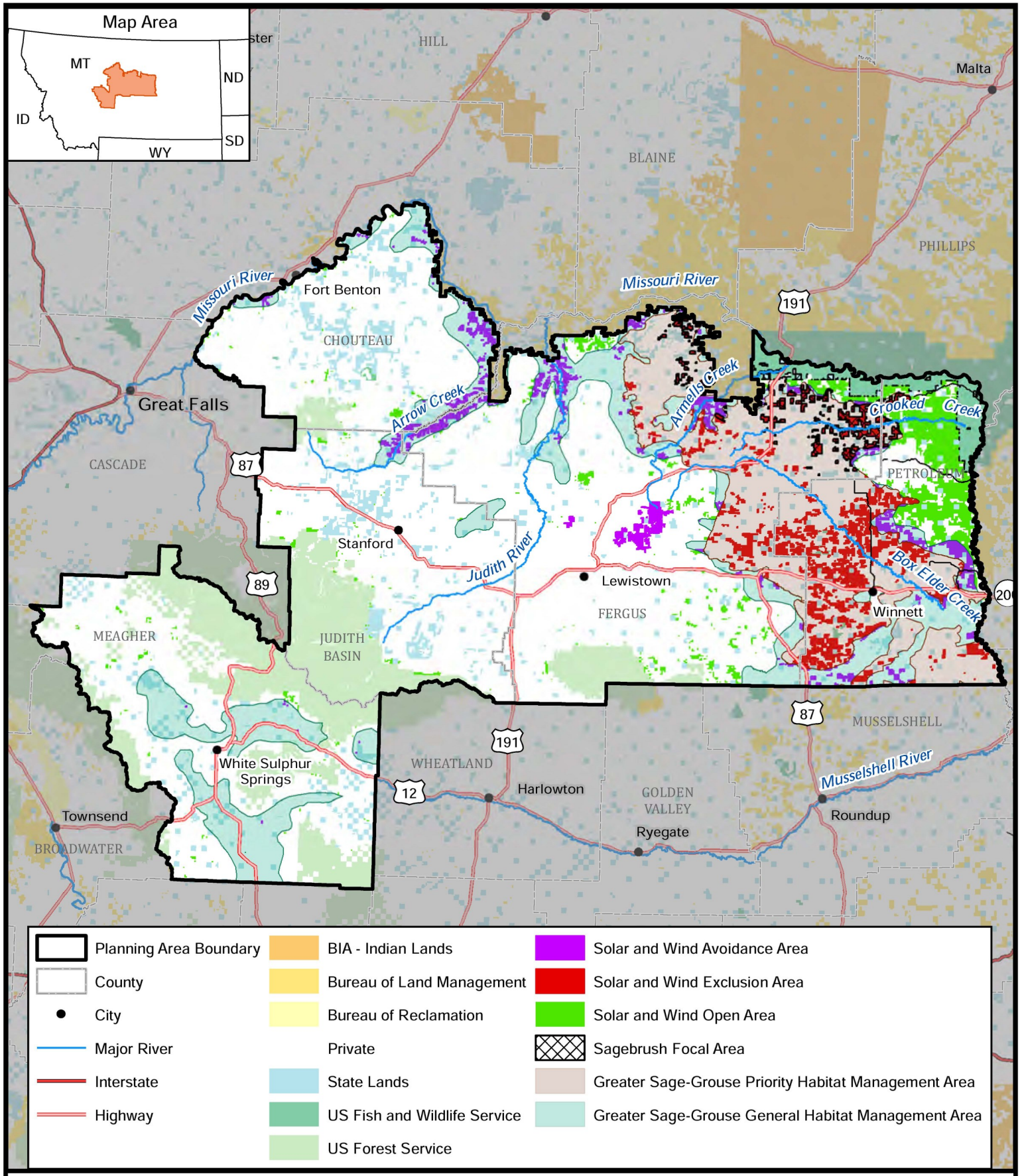
Minor Rights-of-Way Avoidance Areas - Proposed Plan

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 3



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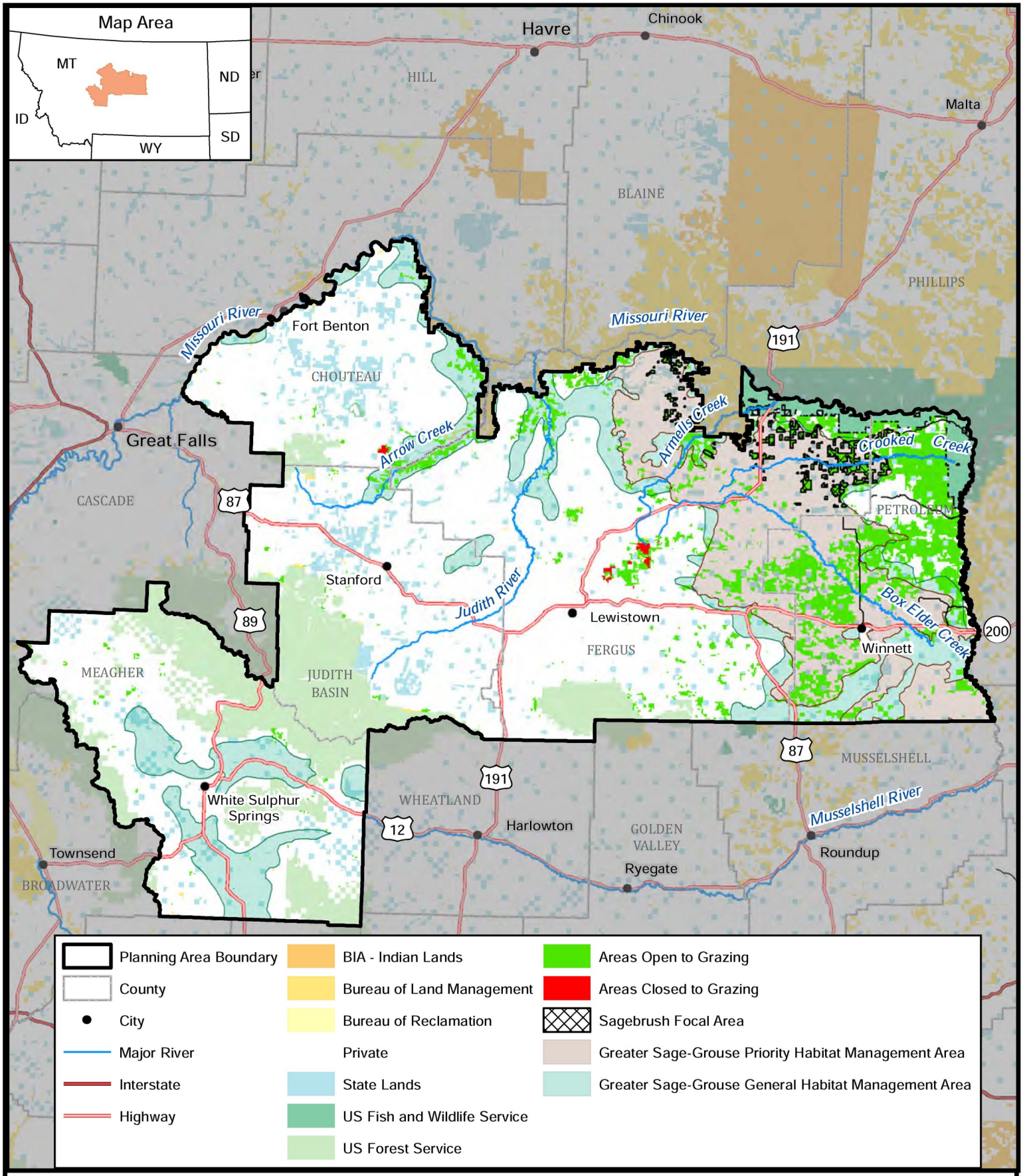
Rights-of-Way Wind and Solar Energy - Proposed Plan

Source: BLM 2012a

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 4



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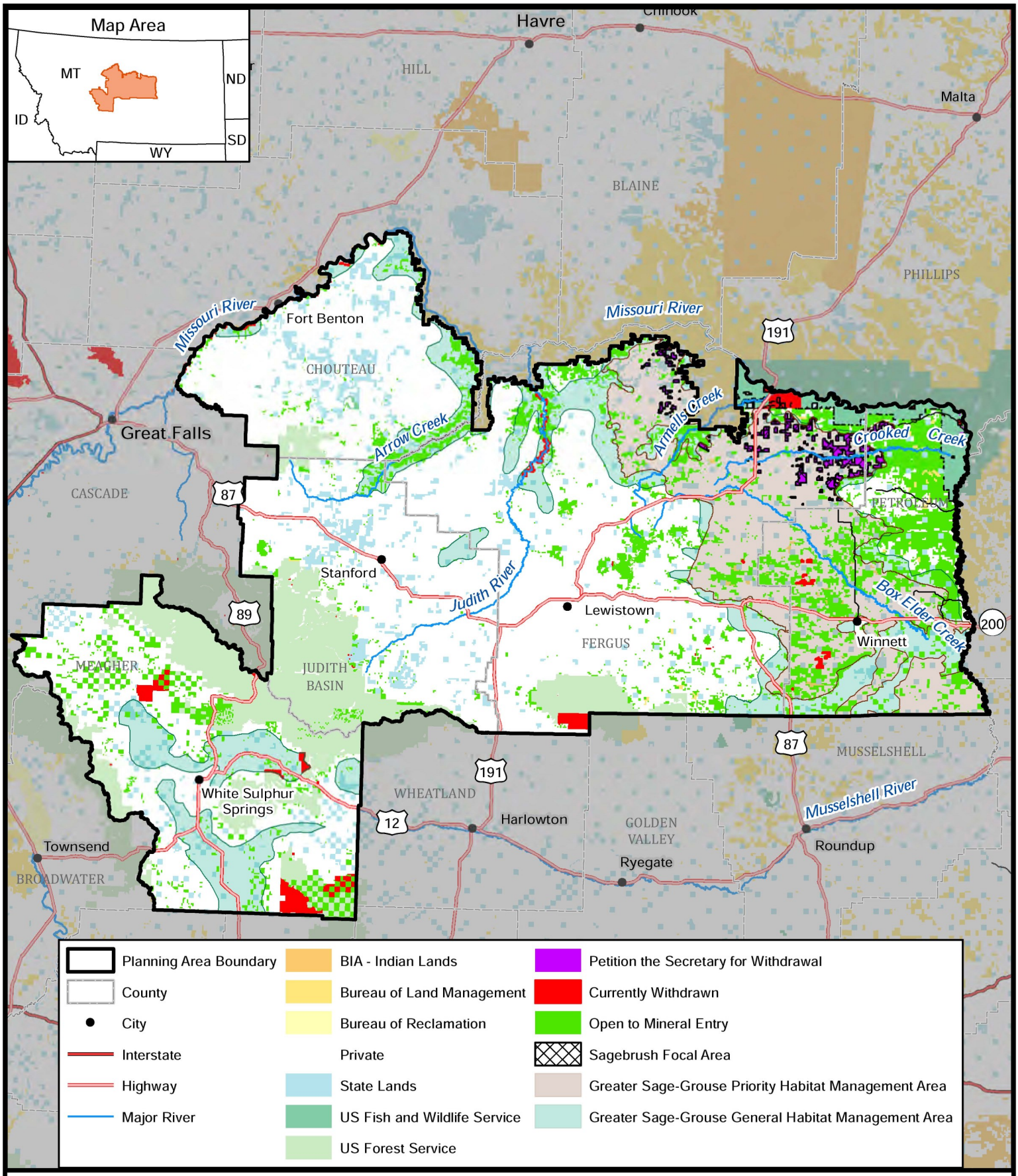
Areas Open and Closed, Grazing Allotments - Proposed Plan

Source: BLM 2012a

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 05



Withdrawals and Recommend for Withdrawal - Proposed Plan

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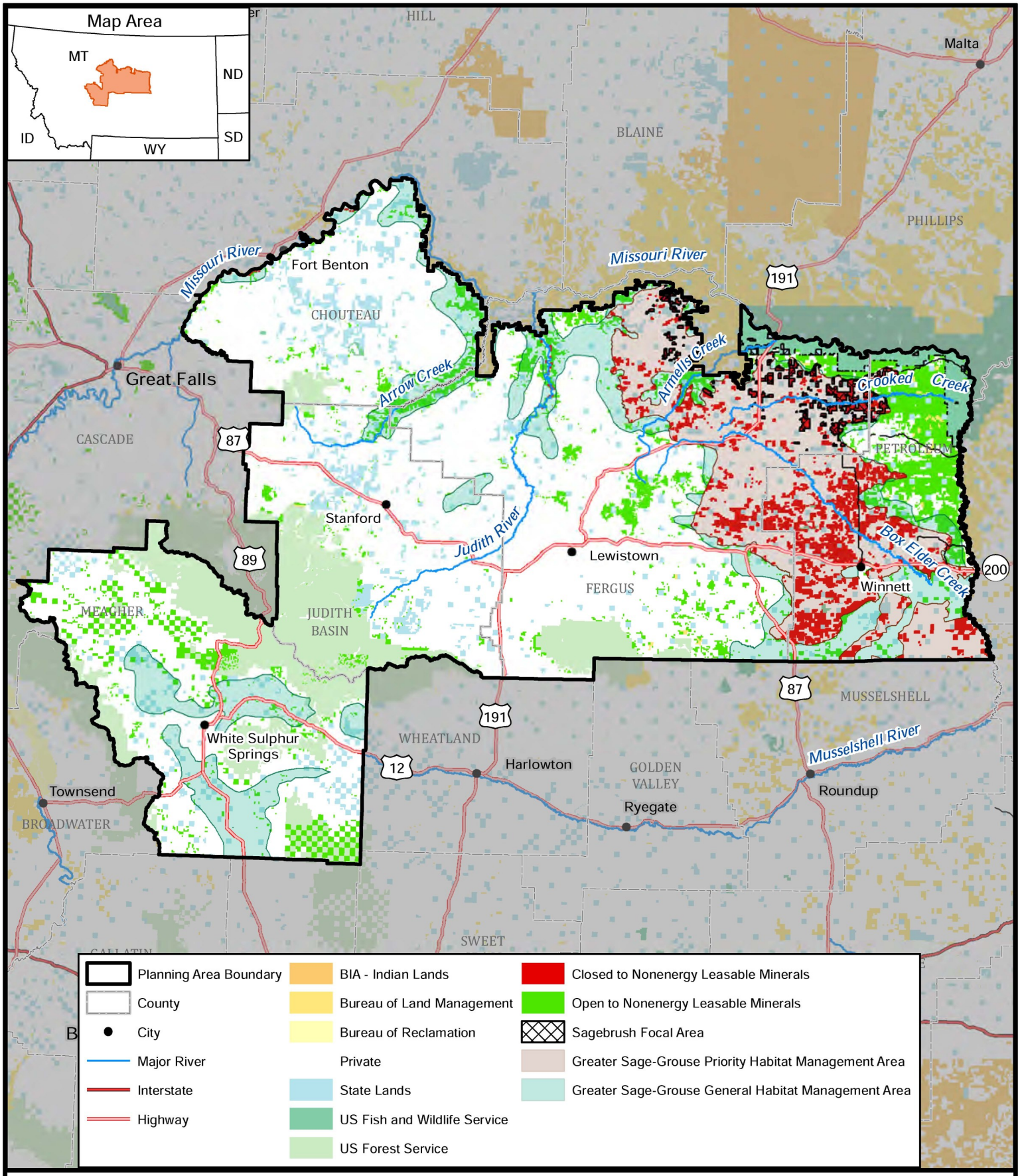
Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 06



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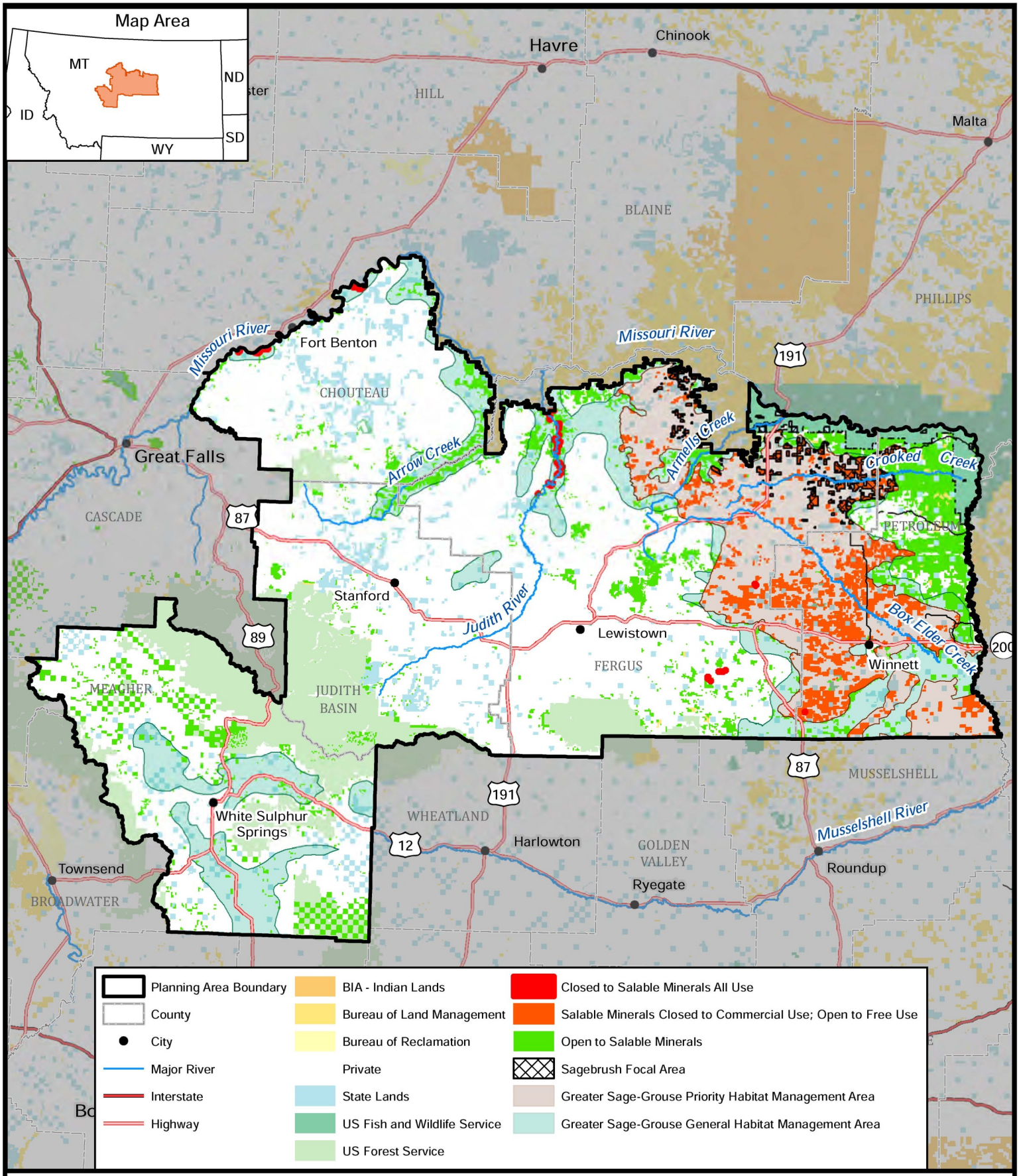
Nonenergy Leasable Minerals - Proposed Plan

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 07



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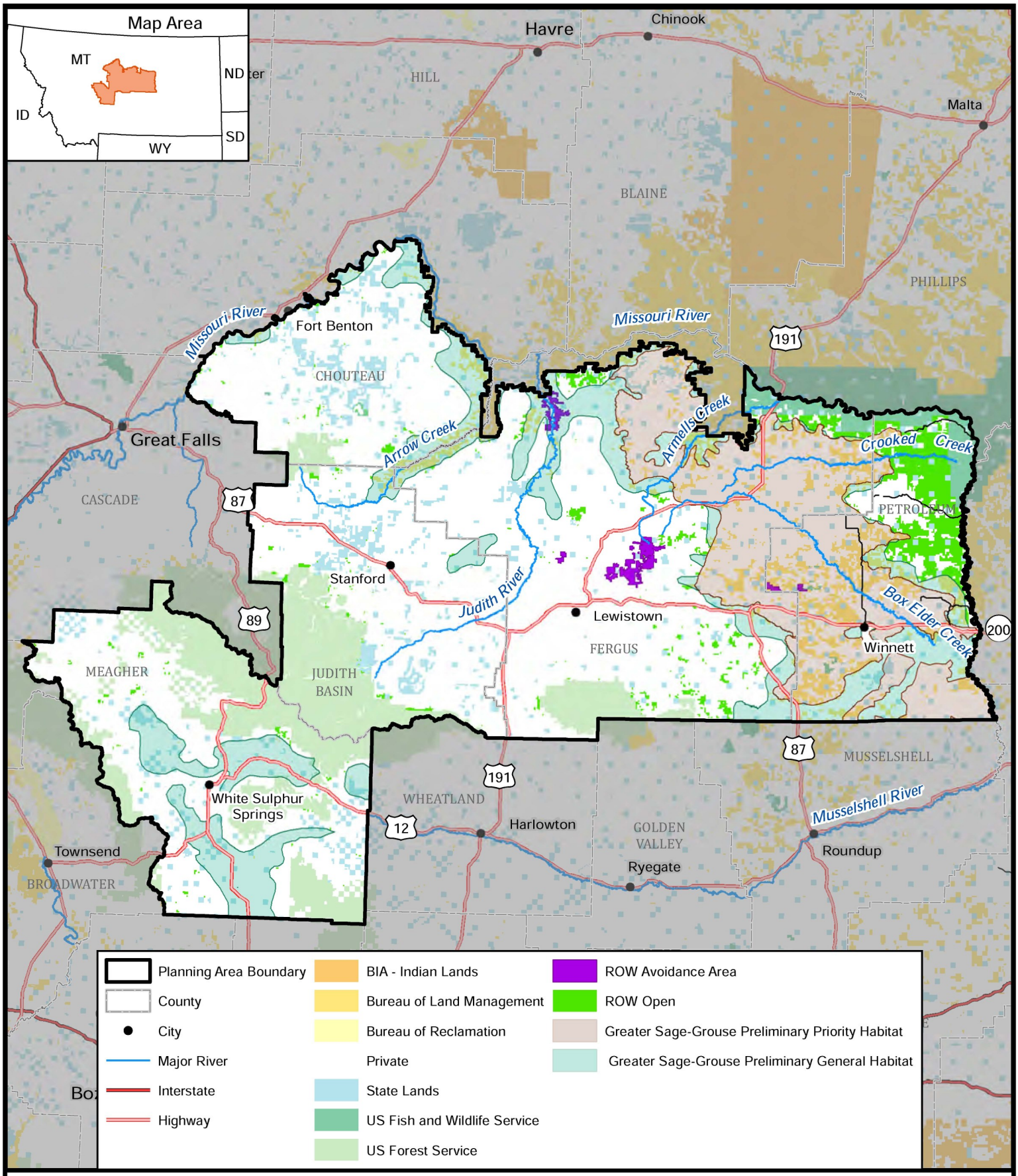
Salable Minerals - Proposed Plan

Source: BLM 2012a

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 08



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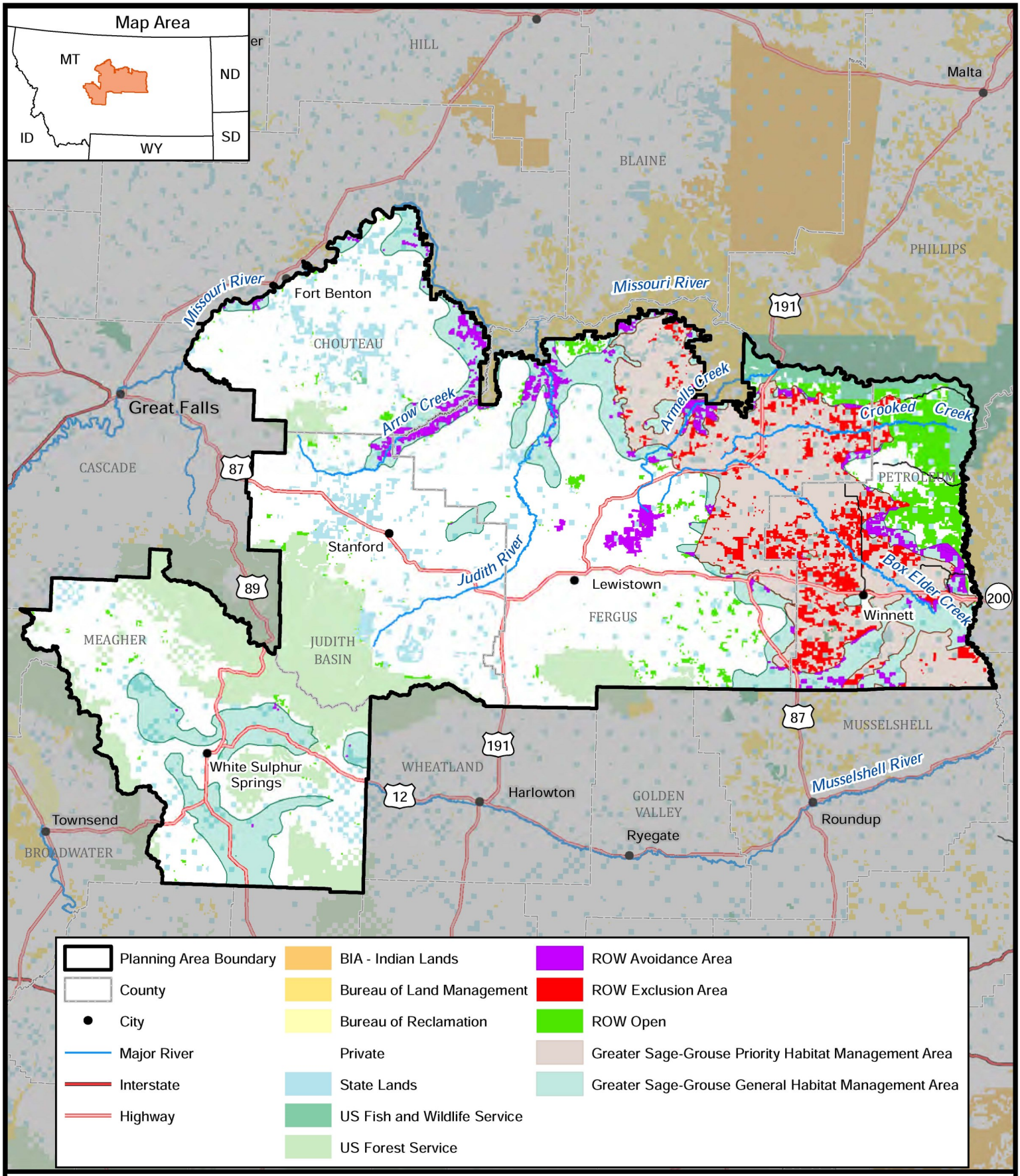
Rights-of-Way Avoidance Areas - Alternative A

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2- 09



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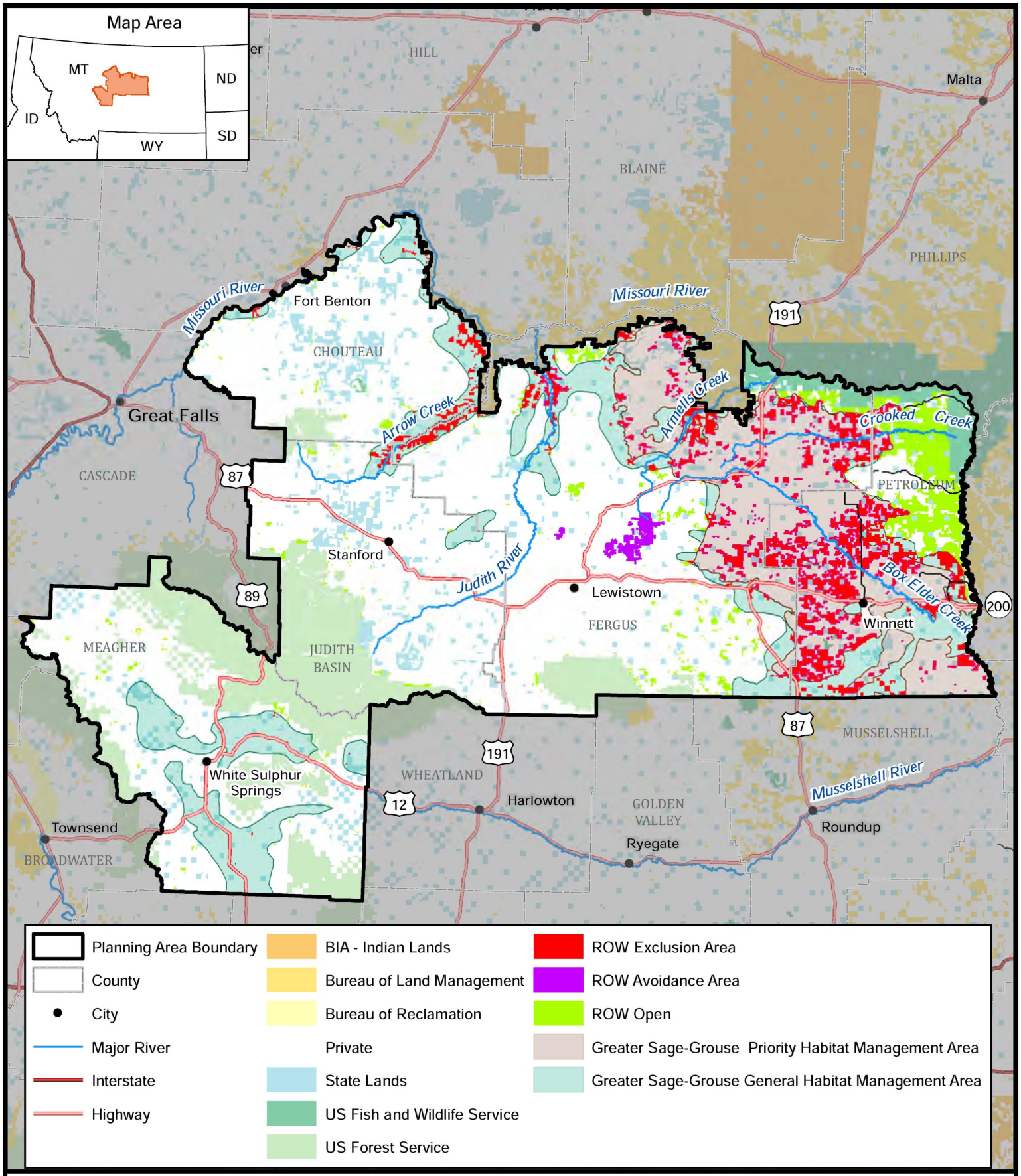
Rights-of-Way Avoidance and Exclusion Areas - Alternative B

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 10



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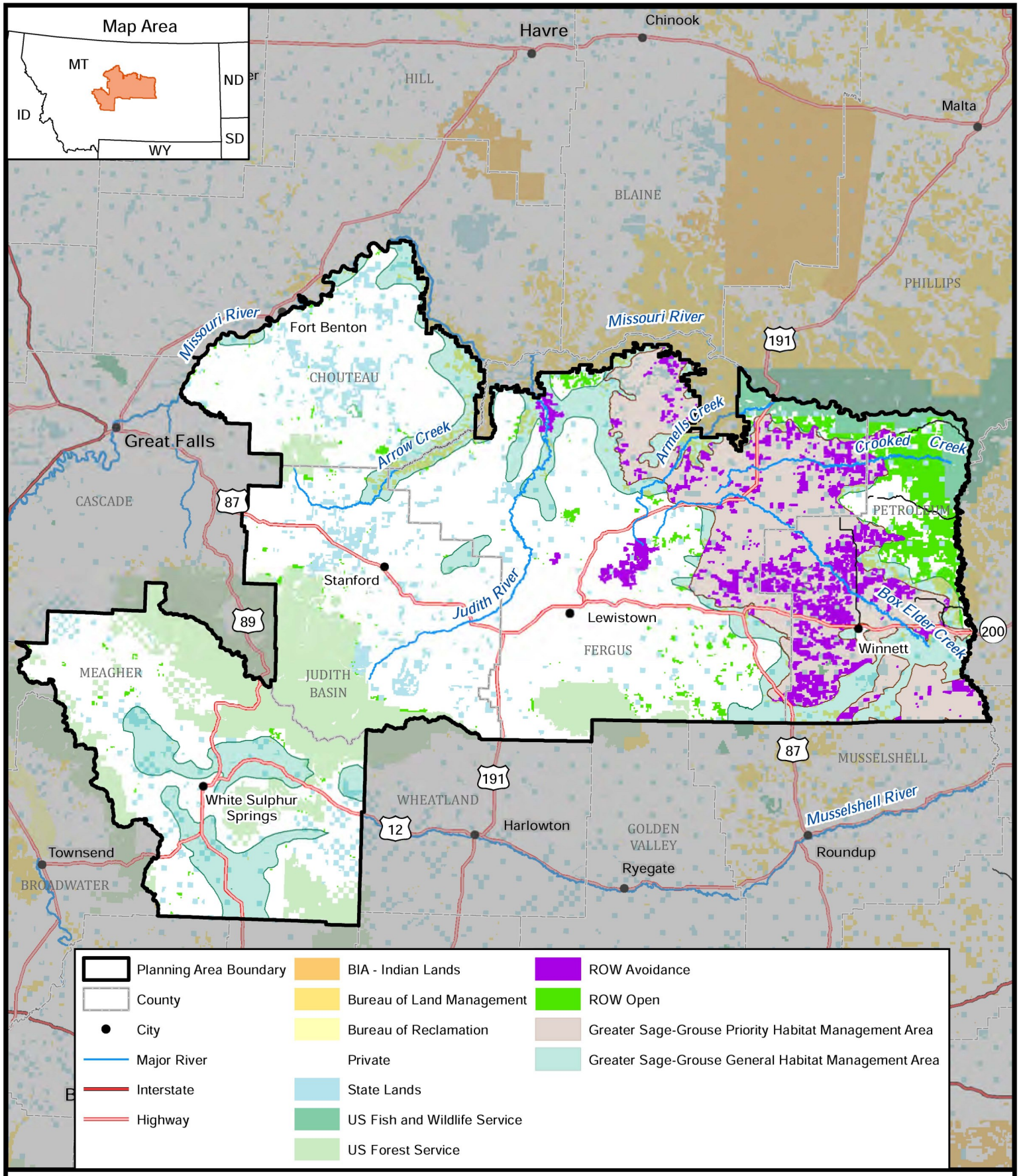
Rights-of-Way Exclusion Areas - Alternative C

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 11



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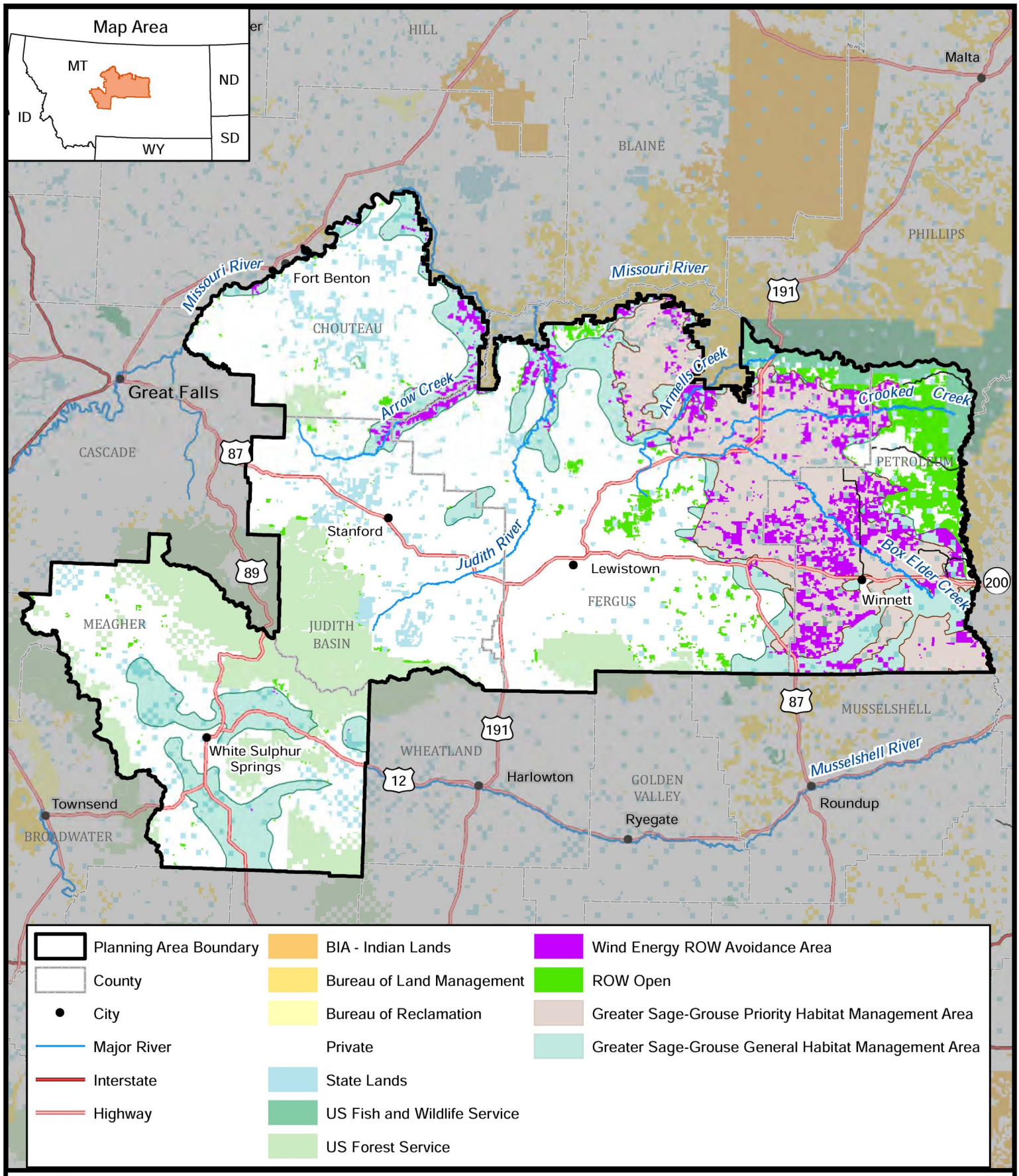
Rights-of-Way Avoidance Areas - Alternative D

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 12



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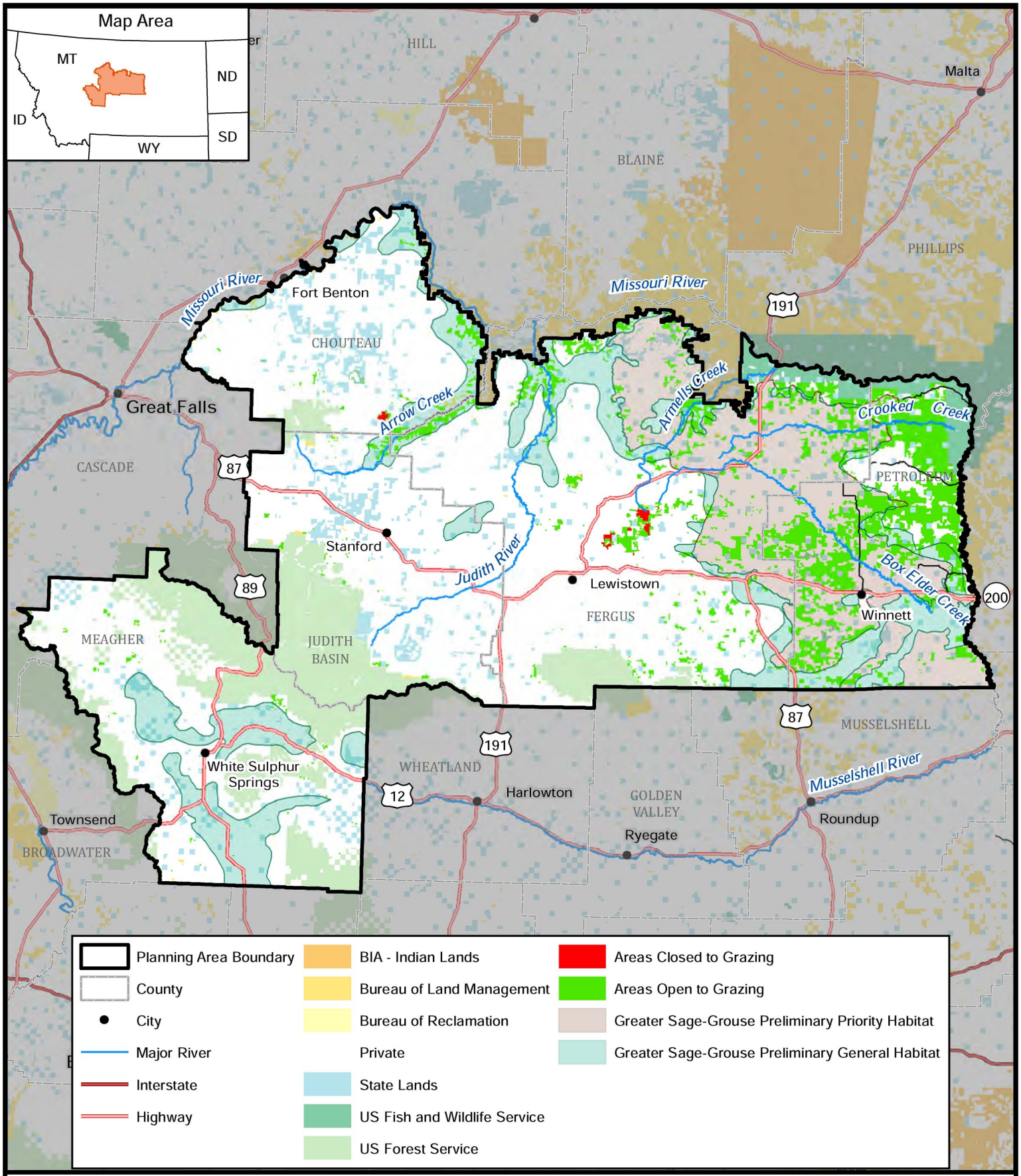
Rights-of-Way Wind Energy Avoidance Areas - Alternative D

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 13



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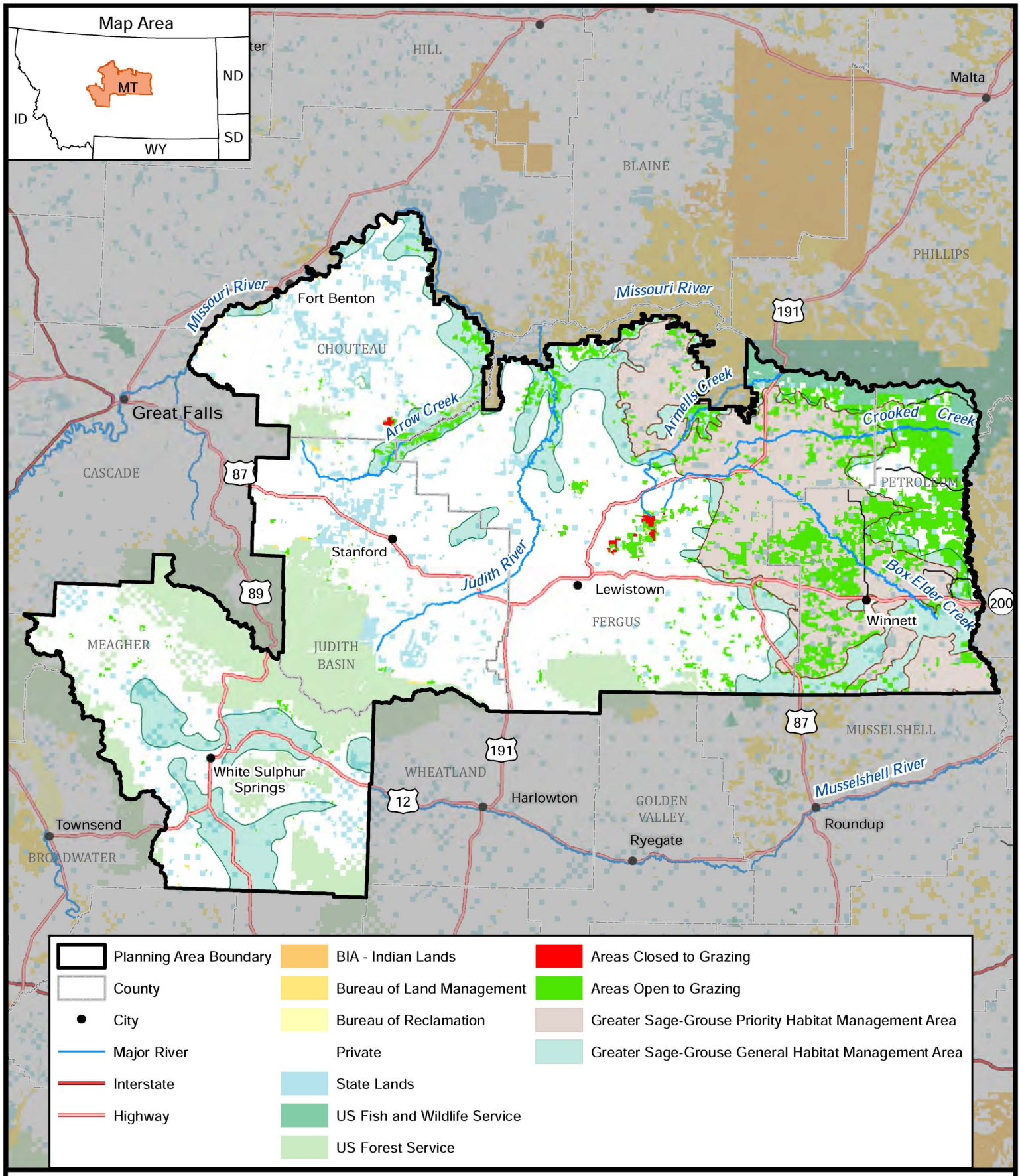
Grazing Allotments Alternative A

Source: BLM 2012a

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 14



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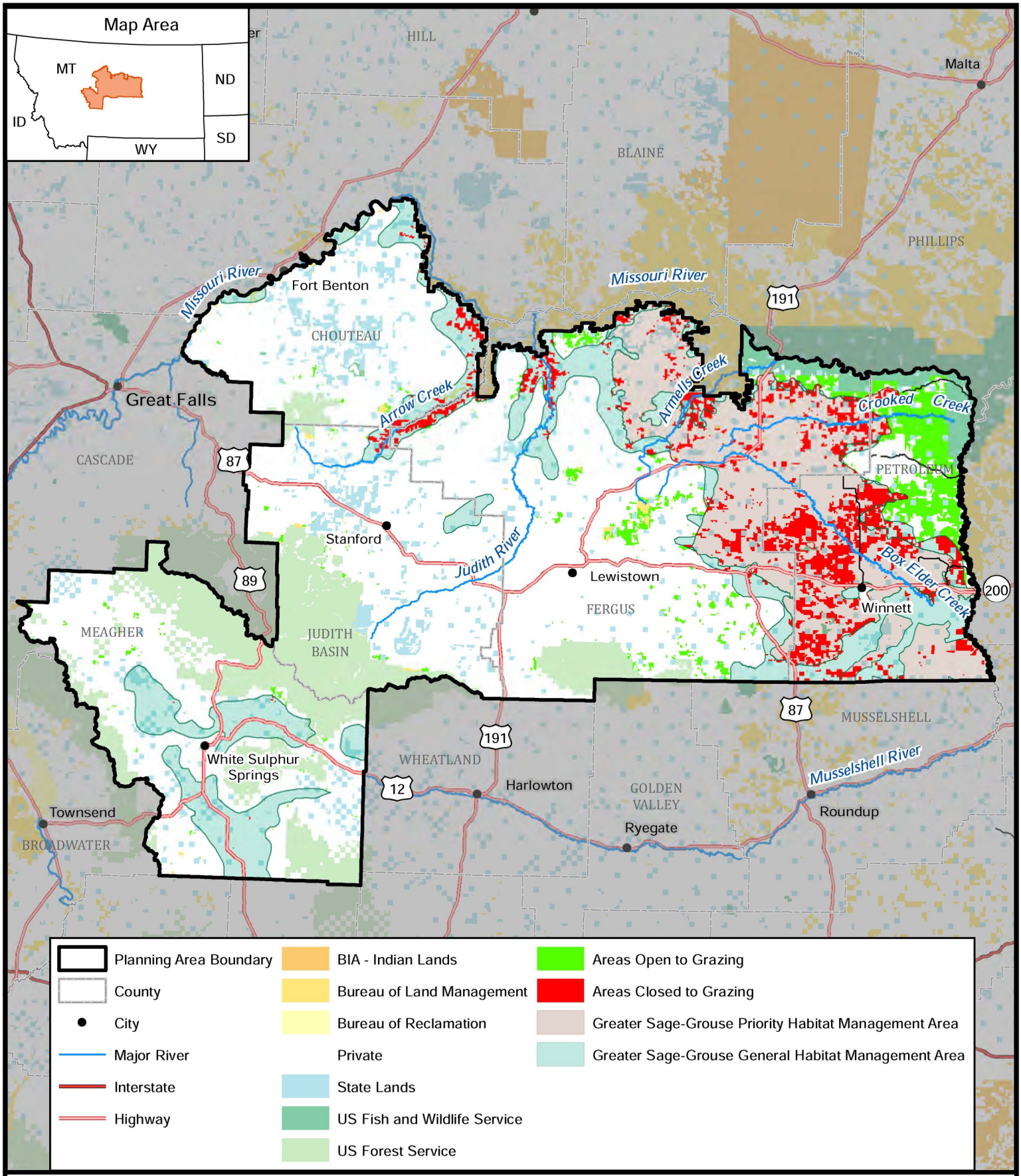
Areas Open and Closed Grazing Allotments Alternative B & D

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 15



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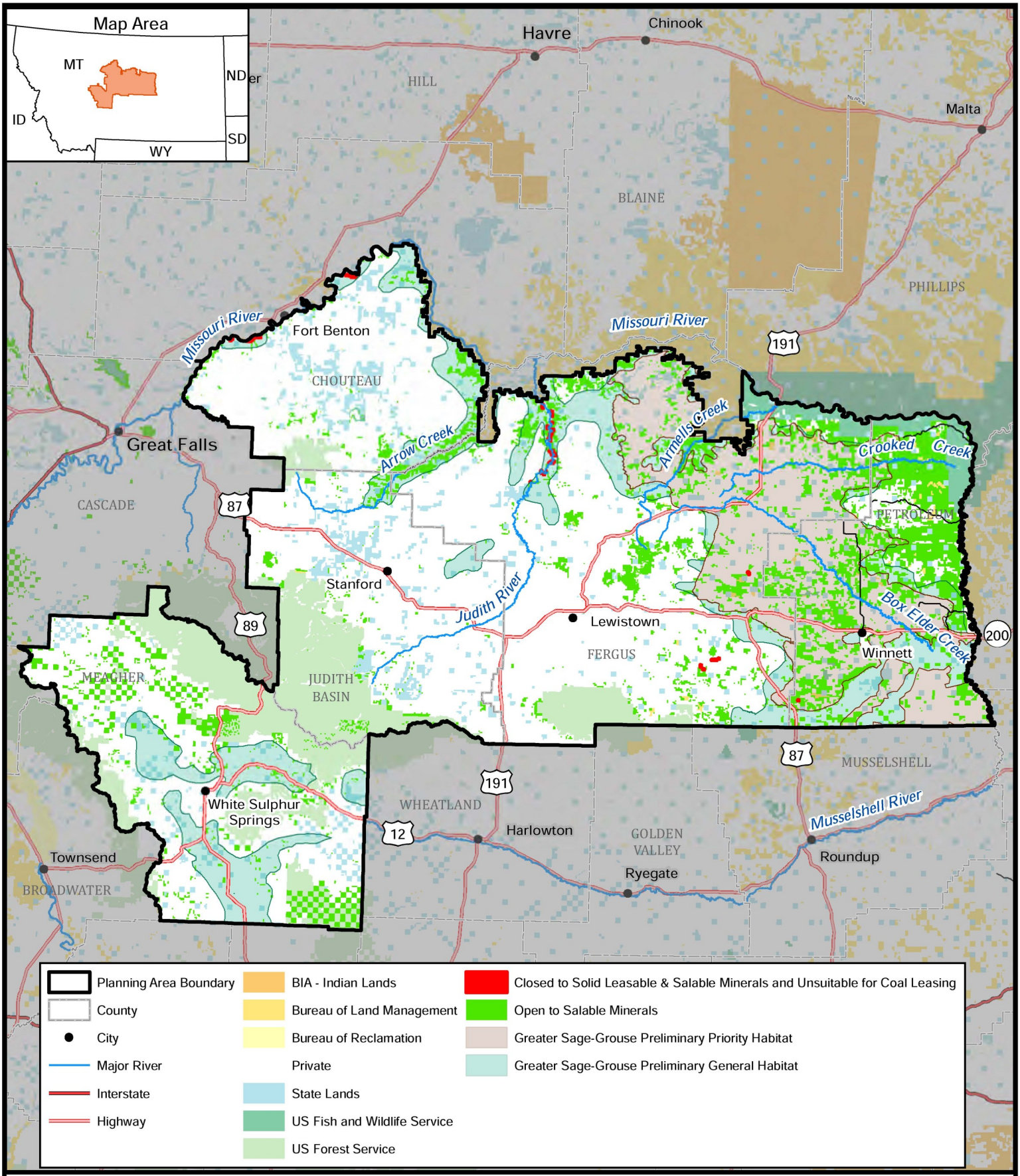
Areas Open and Closed Grazing Allotments Alternative C

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 16



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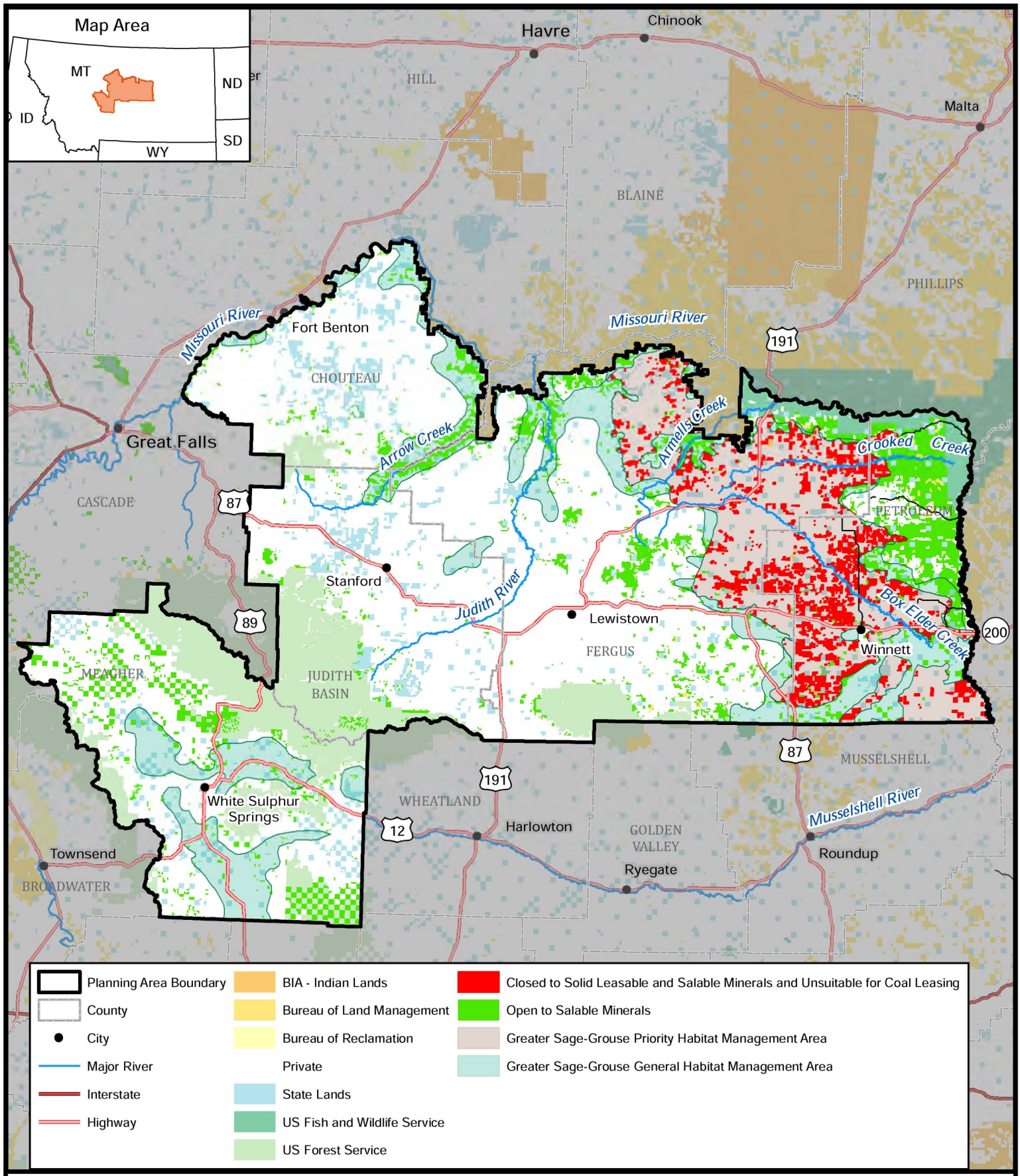
Solid Leasable and Salable Minerals - Alternative A

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 17



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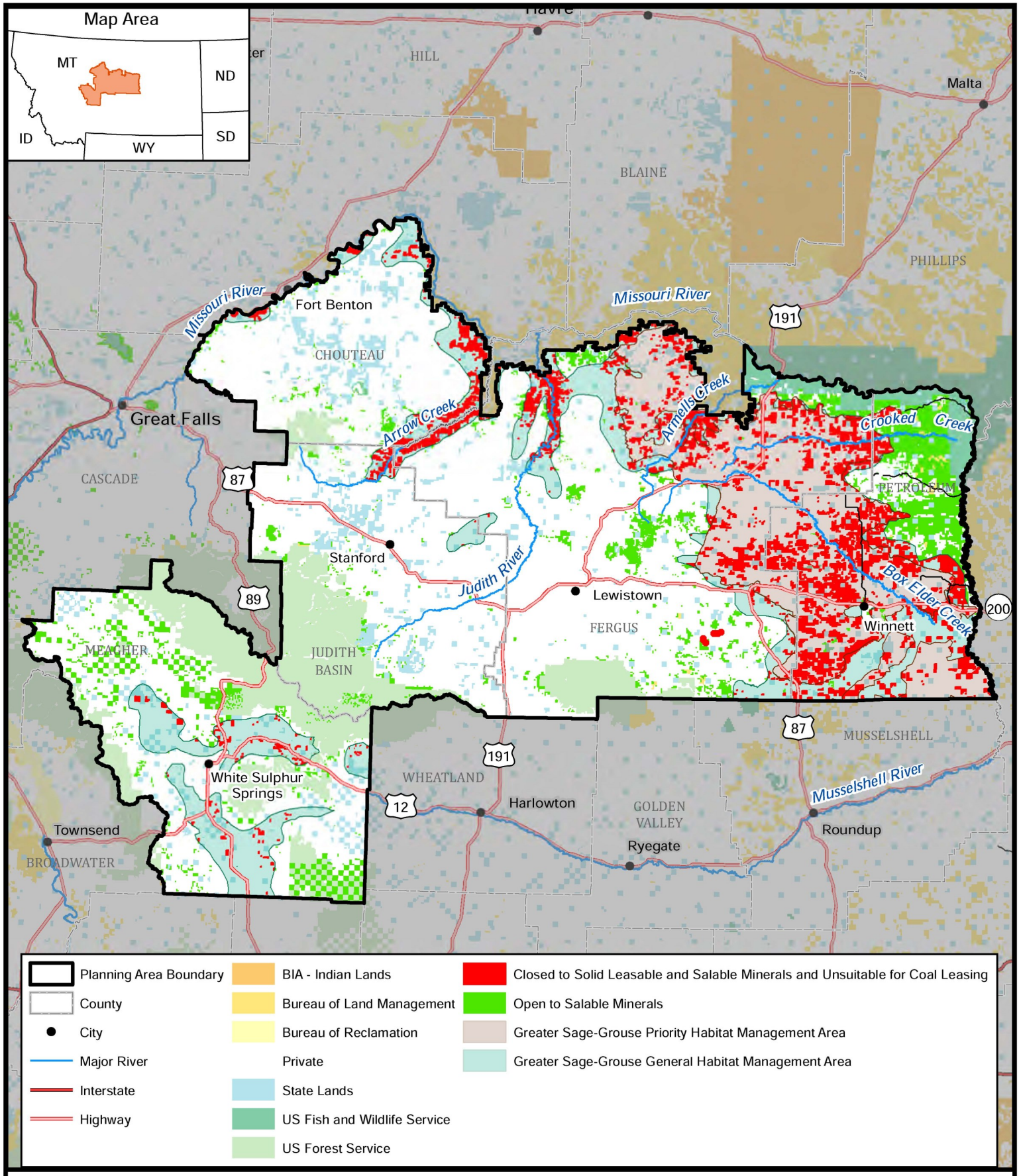
Solid Leasable and Salable Minerals - Alternative B

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 18



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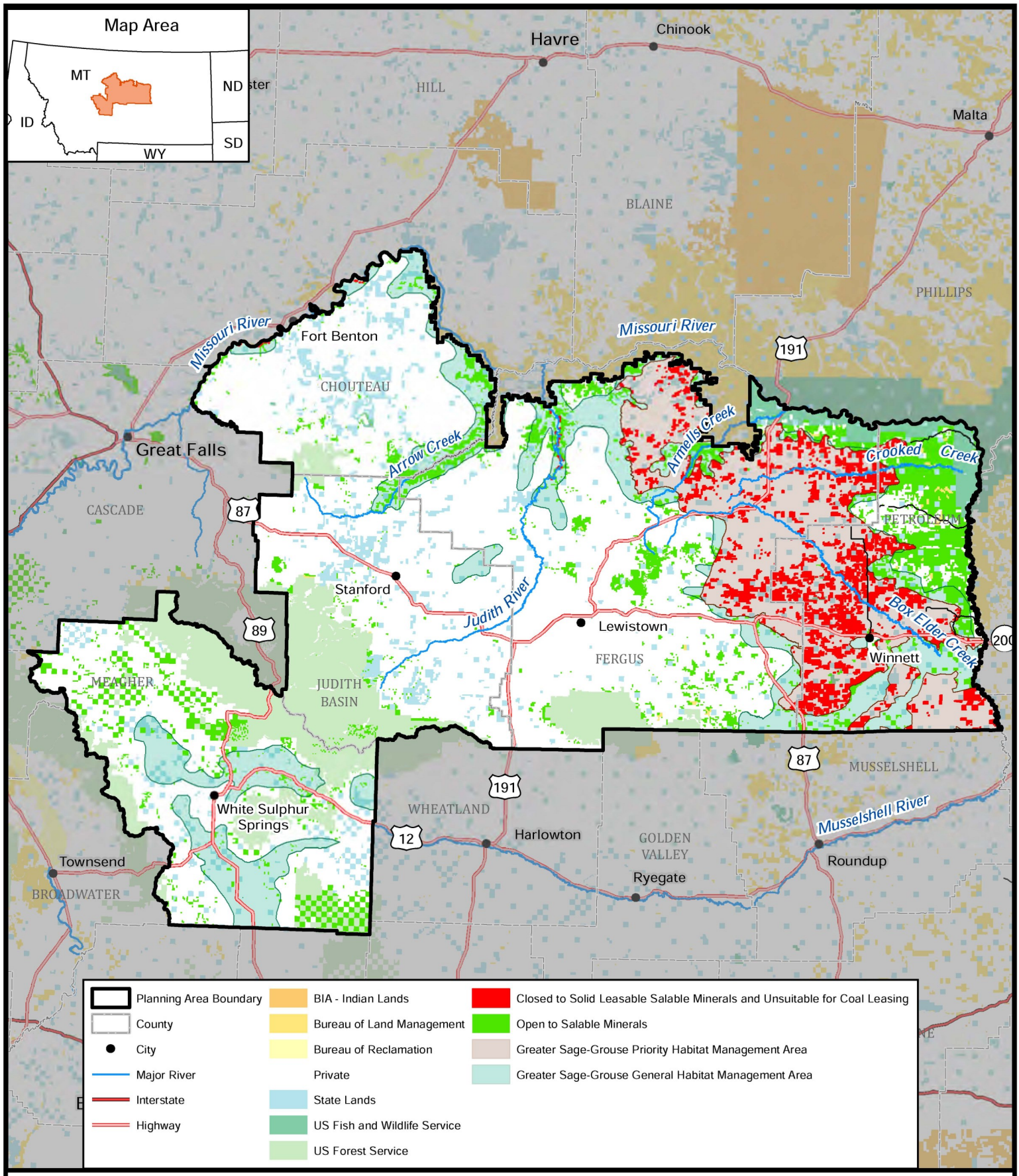
Solid Leasable and Salable Minerals - Alternative C

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 2 - 19



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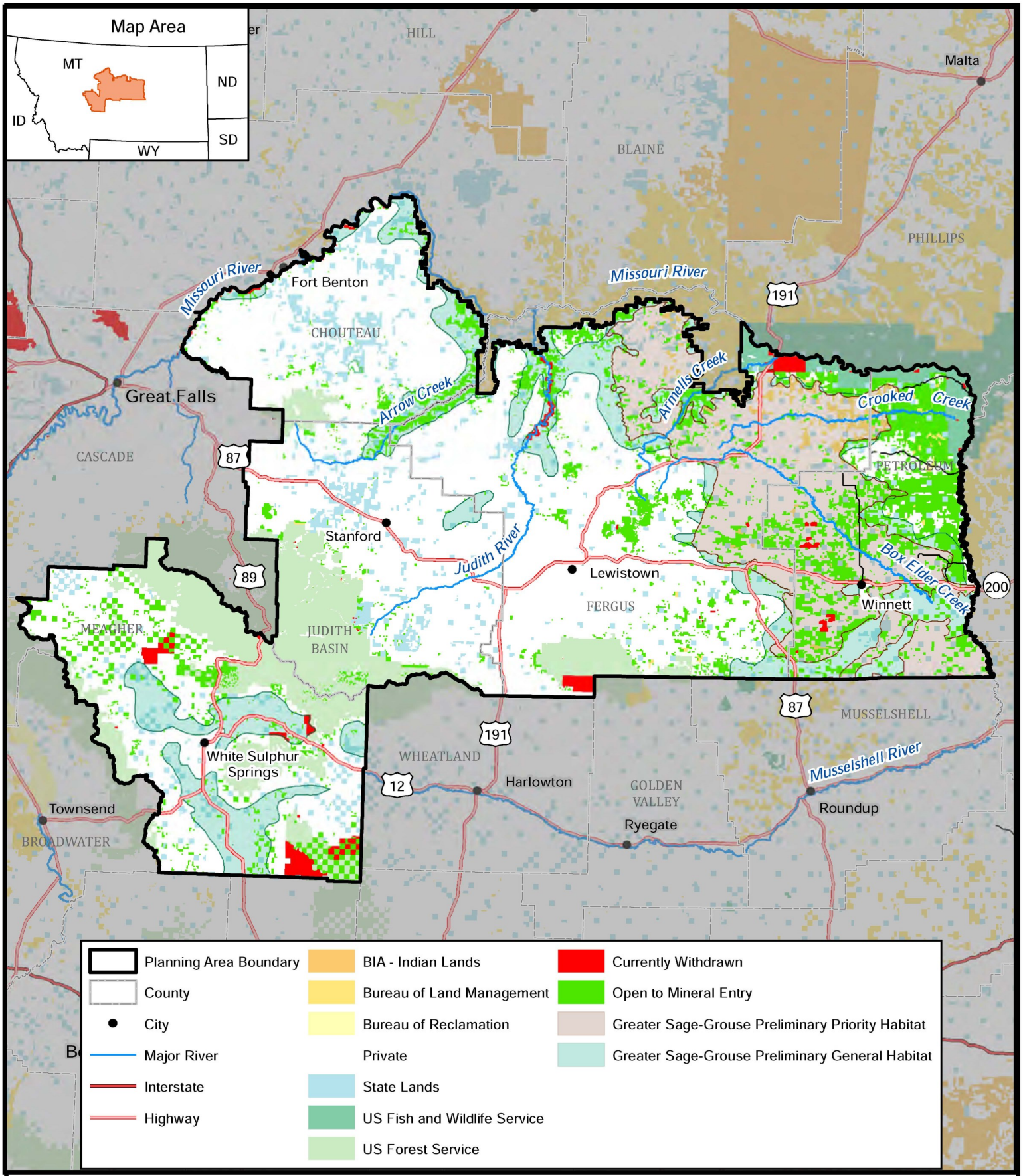
Solid Leasable and Salable Minerals - Alternative D

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 20

Lewistown Field Office Greater Sage-Grouse EIS



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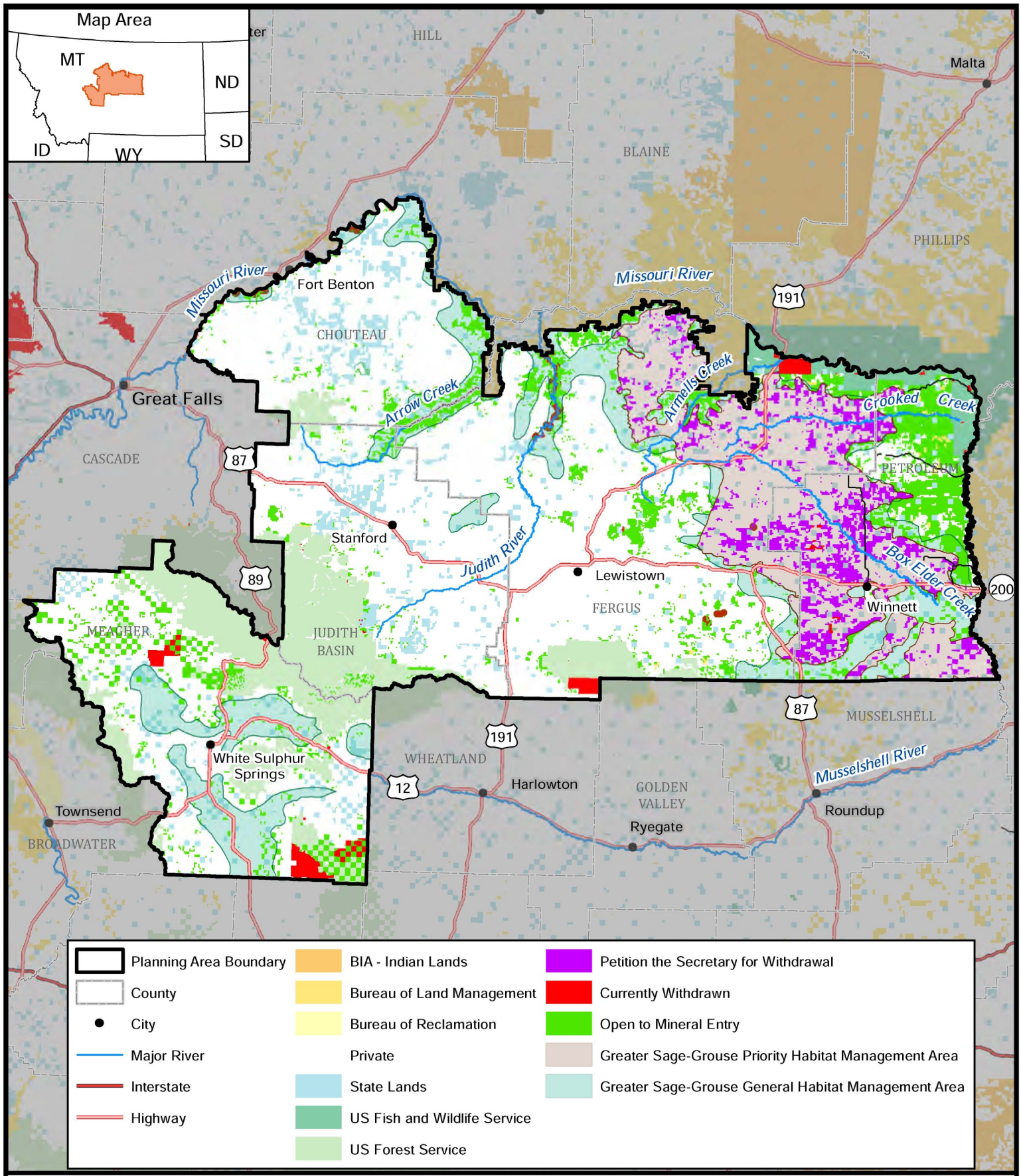
Withdrawals and Recommend for Withdrawal - Alternative A

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Date: 4/23/2015

Figure 2 - 21



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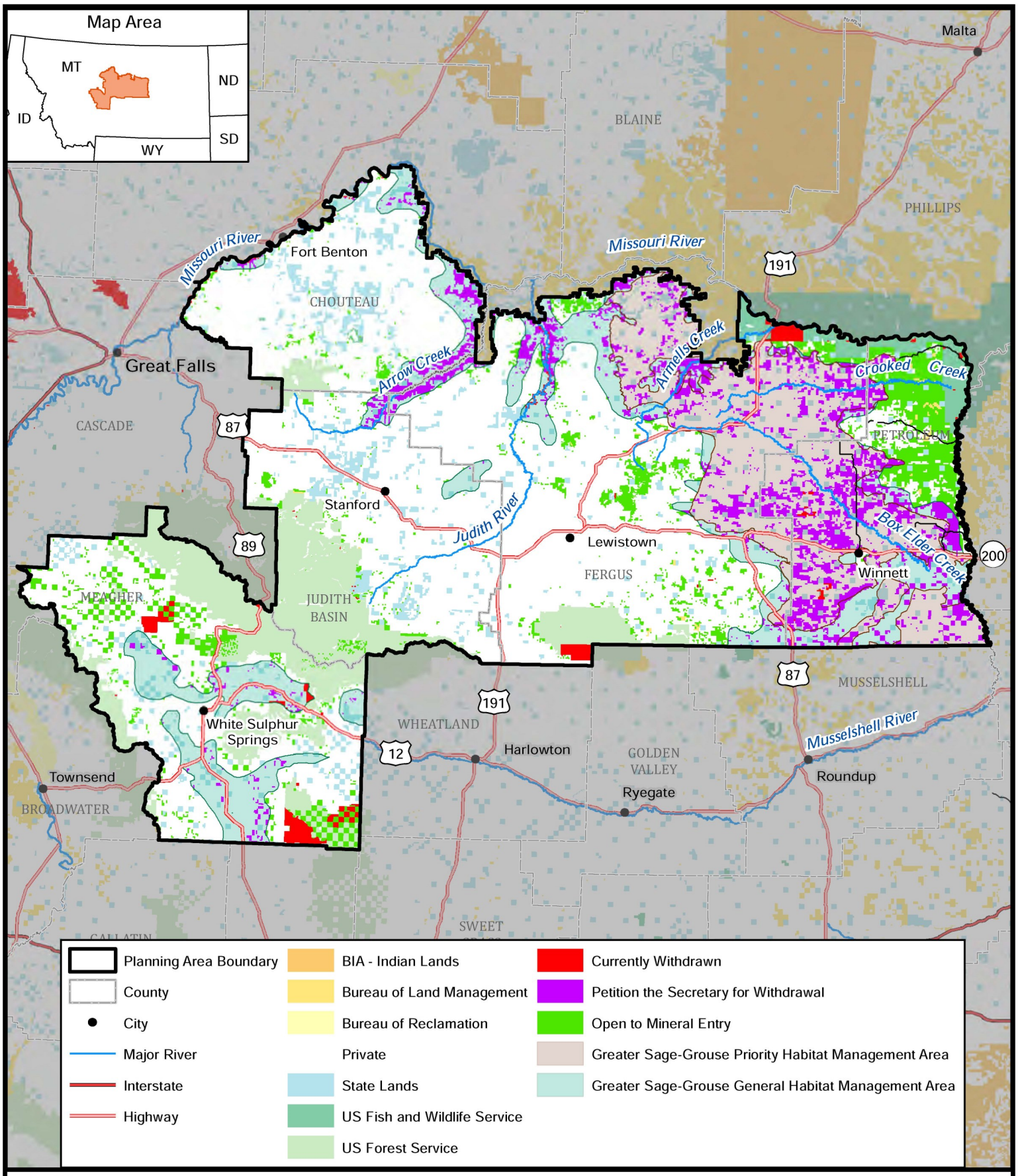
Withdrawals and Recommend for Withdrawal - Alternative B

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 22



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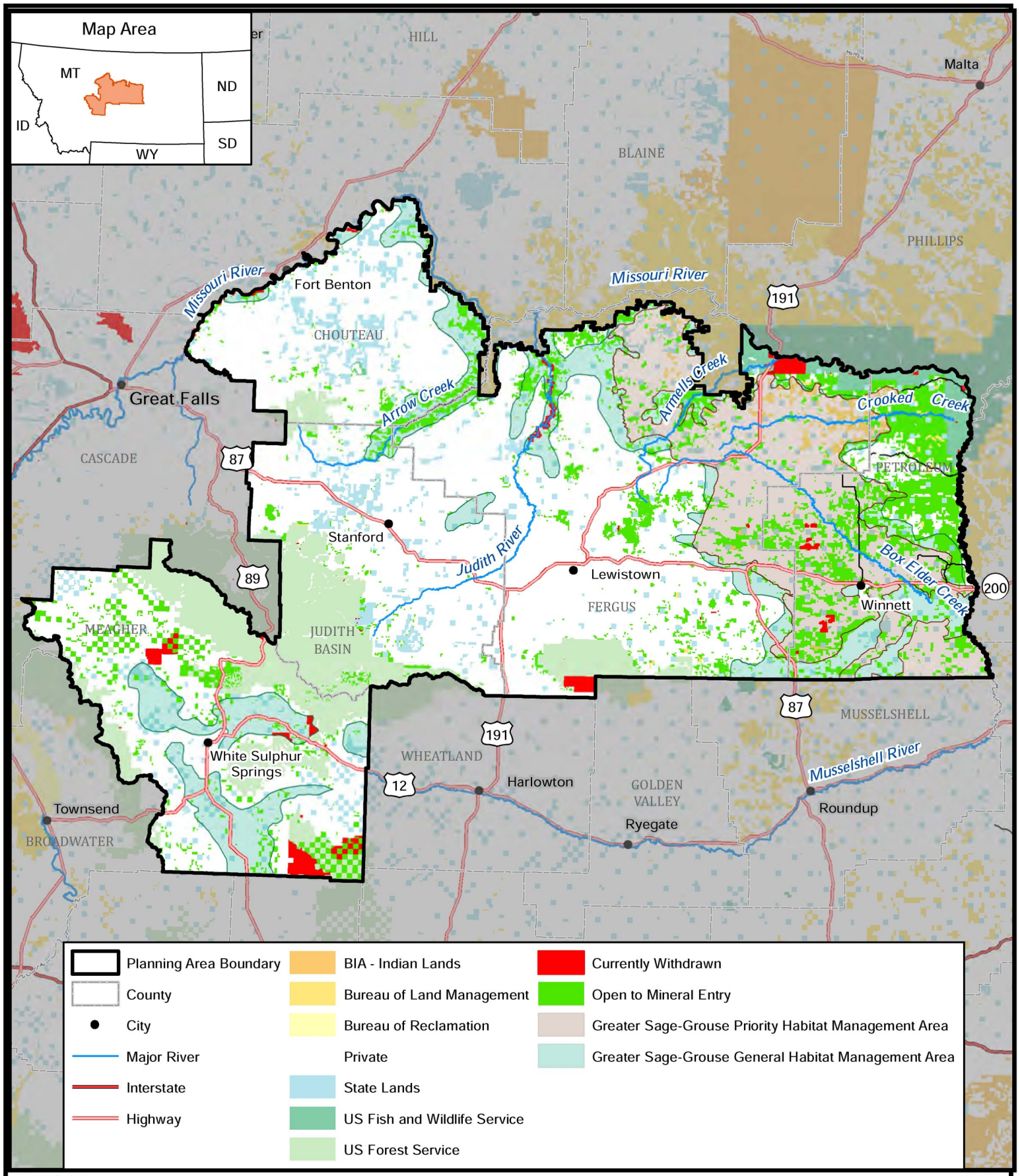
Withdrawals and Recommend for Withdrawal - Alternative C

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 23



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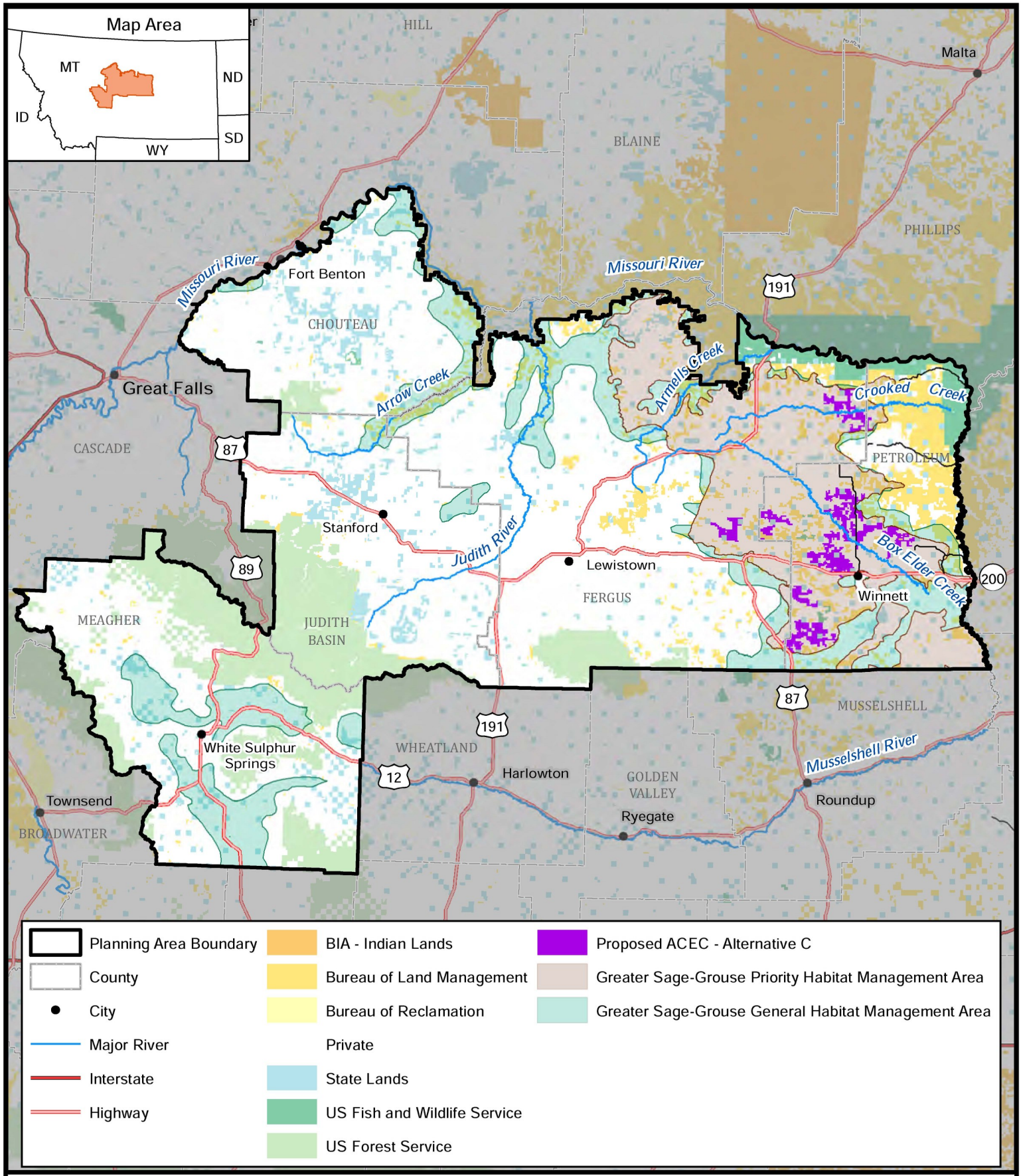
Withdrawals and Recommend for Withdrawal - Alternative D

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2 - 24



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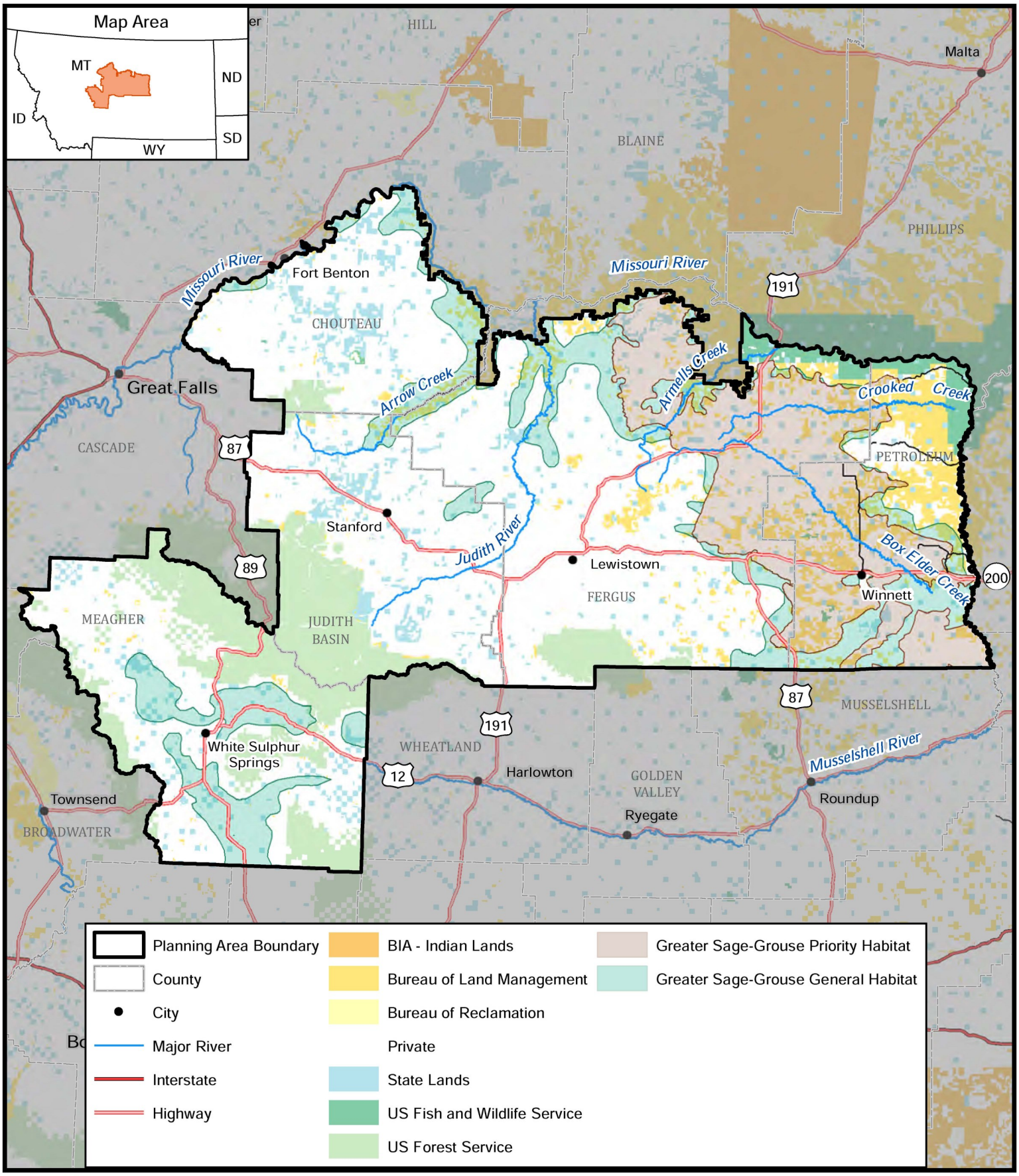
Area of Critical Environmental Concern - Alternative C

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 2-25



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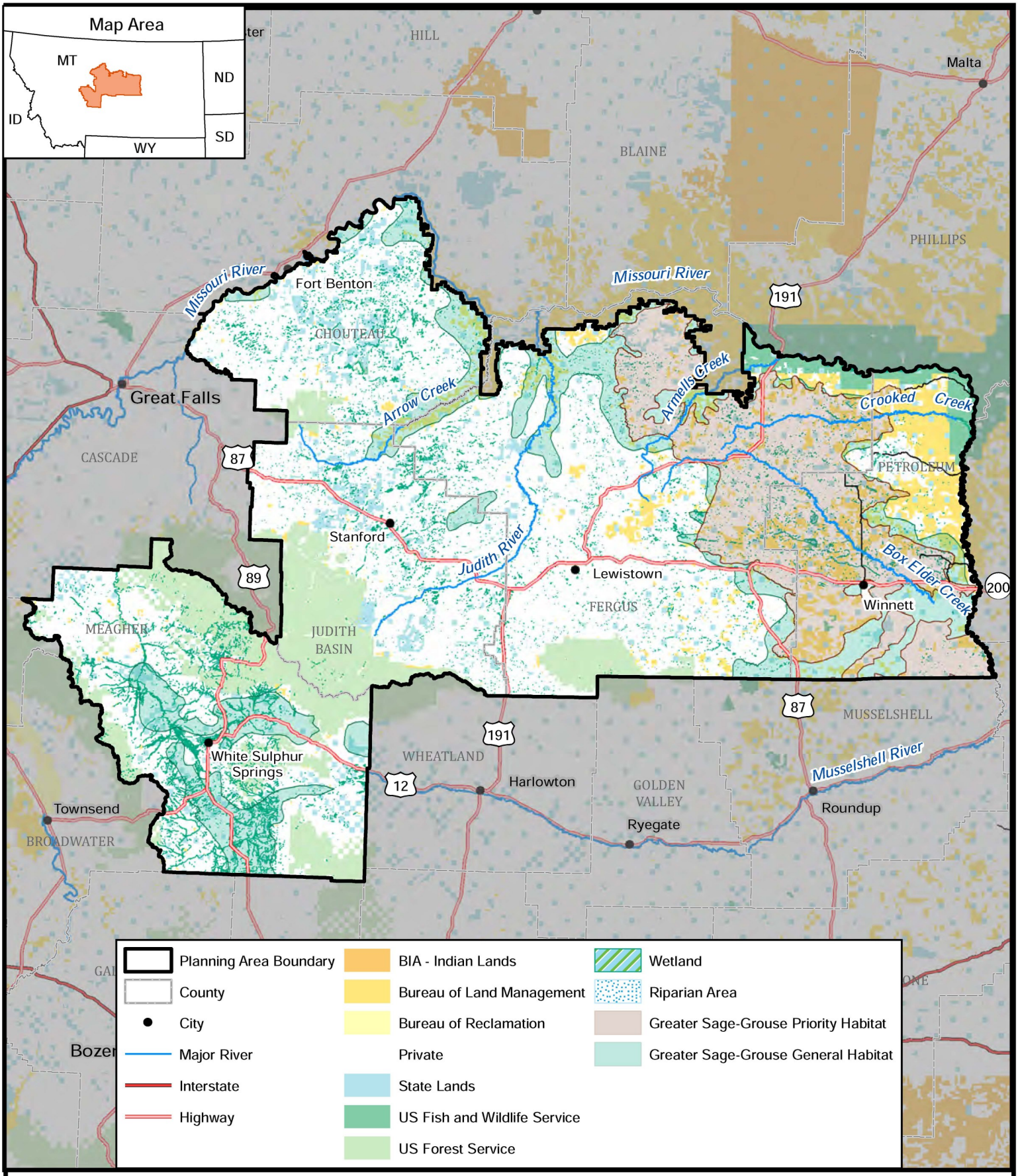
Greater Sage-Grouse Habitat

Lewistown Field Office Greater Sage-Grouse EIS

Source: MT FWP 2011
Map Date: 4/23/2015

Figure 3 - 01



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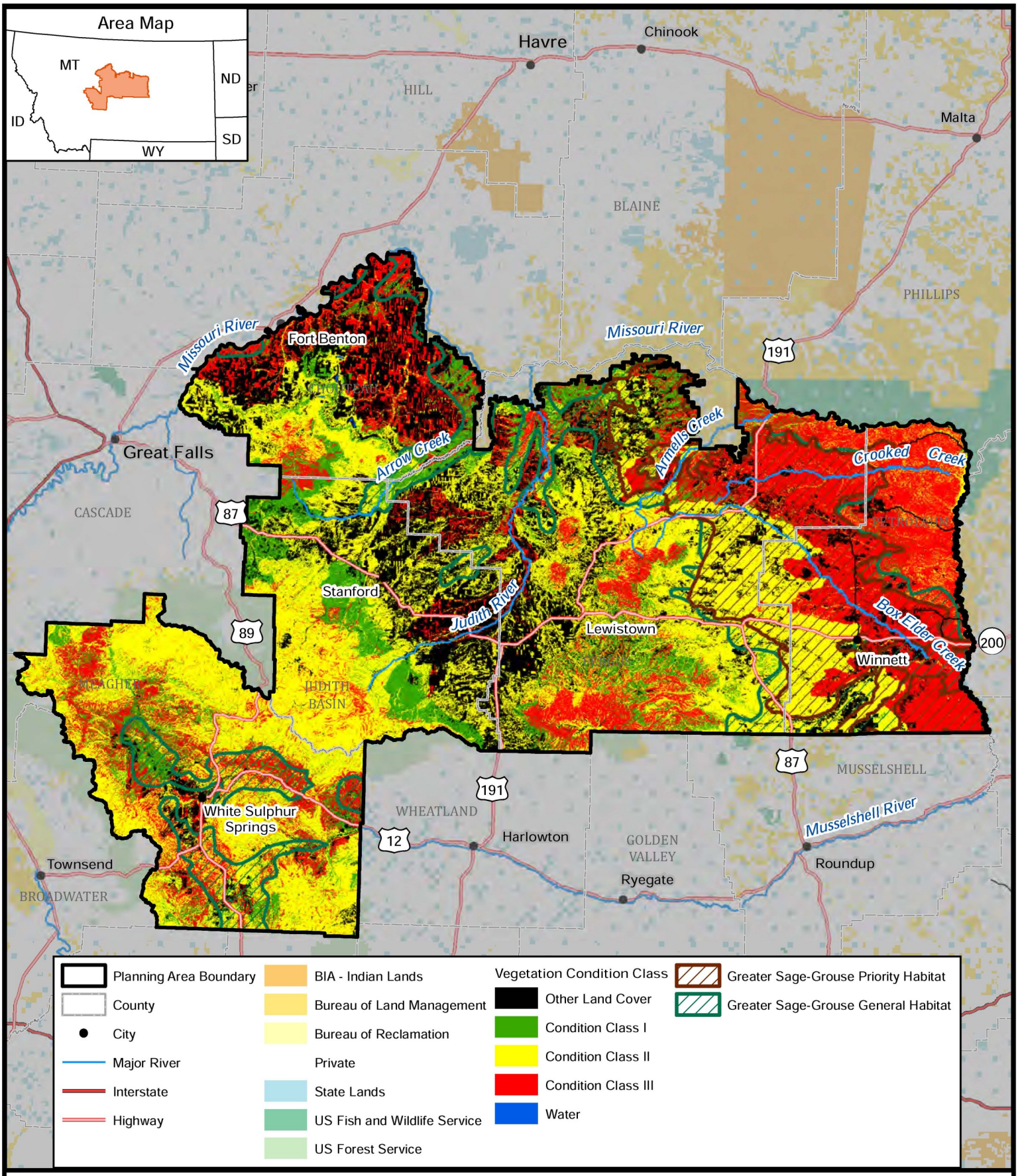
Wetland and Riparian Areas

Source: USGS NHD 2012

Lewistown Field Office Greater Sage-Grouse EIS

Map Date: 4/23/2015

Figure 3 - 02



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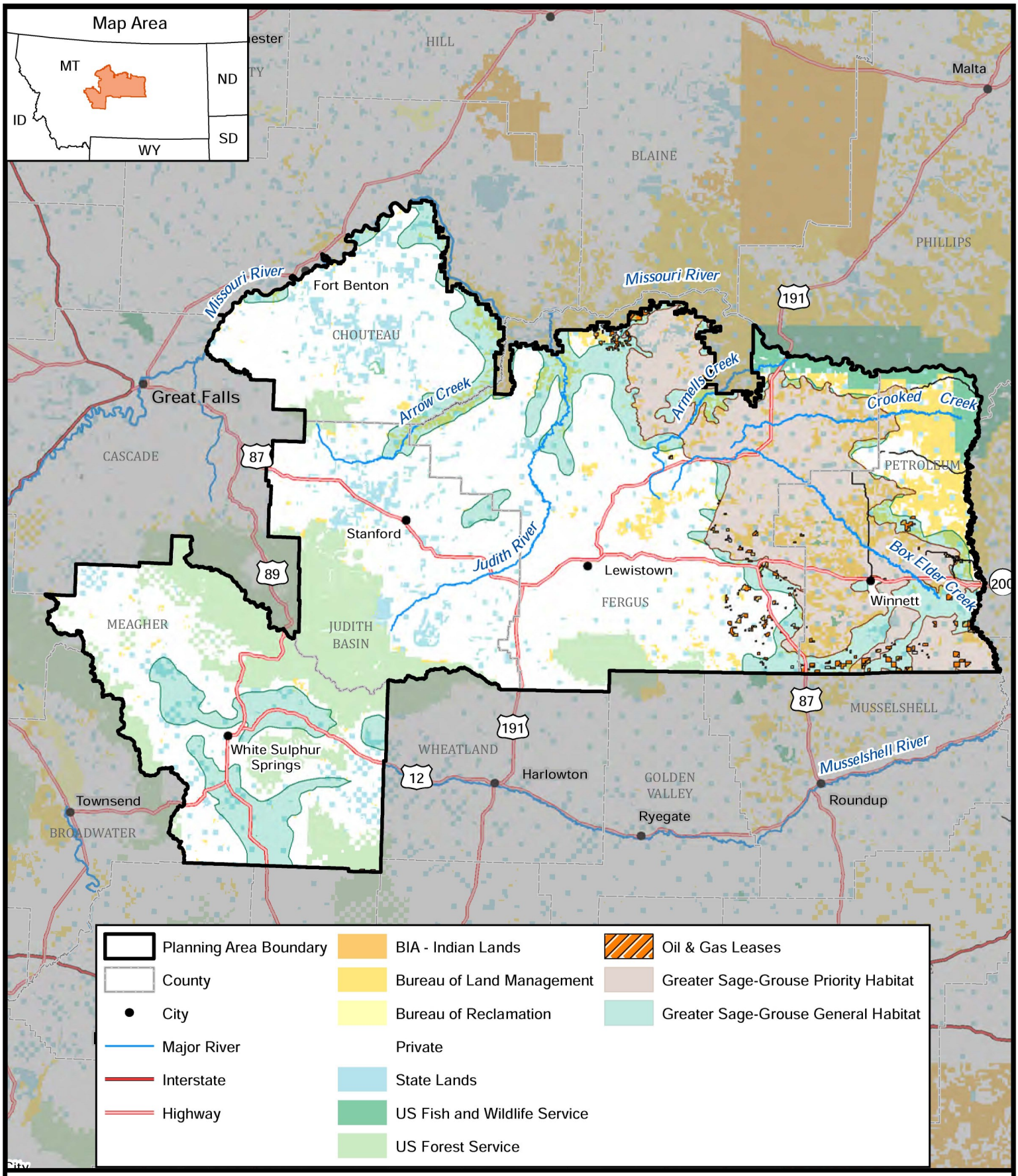
Fire Regime Condition Class

Source: USGS Landfire 2010

Lewistown Field Office Greater Sage-Grouse EIS

Map Date: 4/23/2015 Figure 3 - 03



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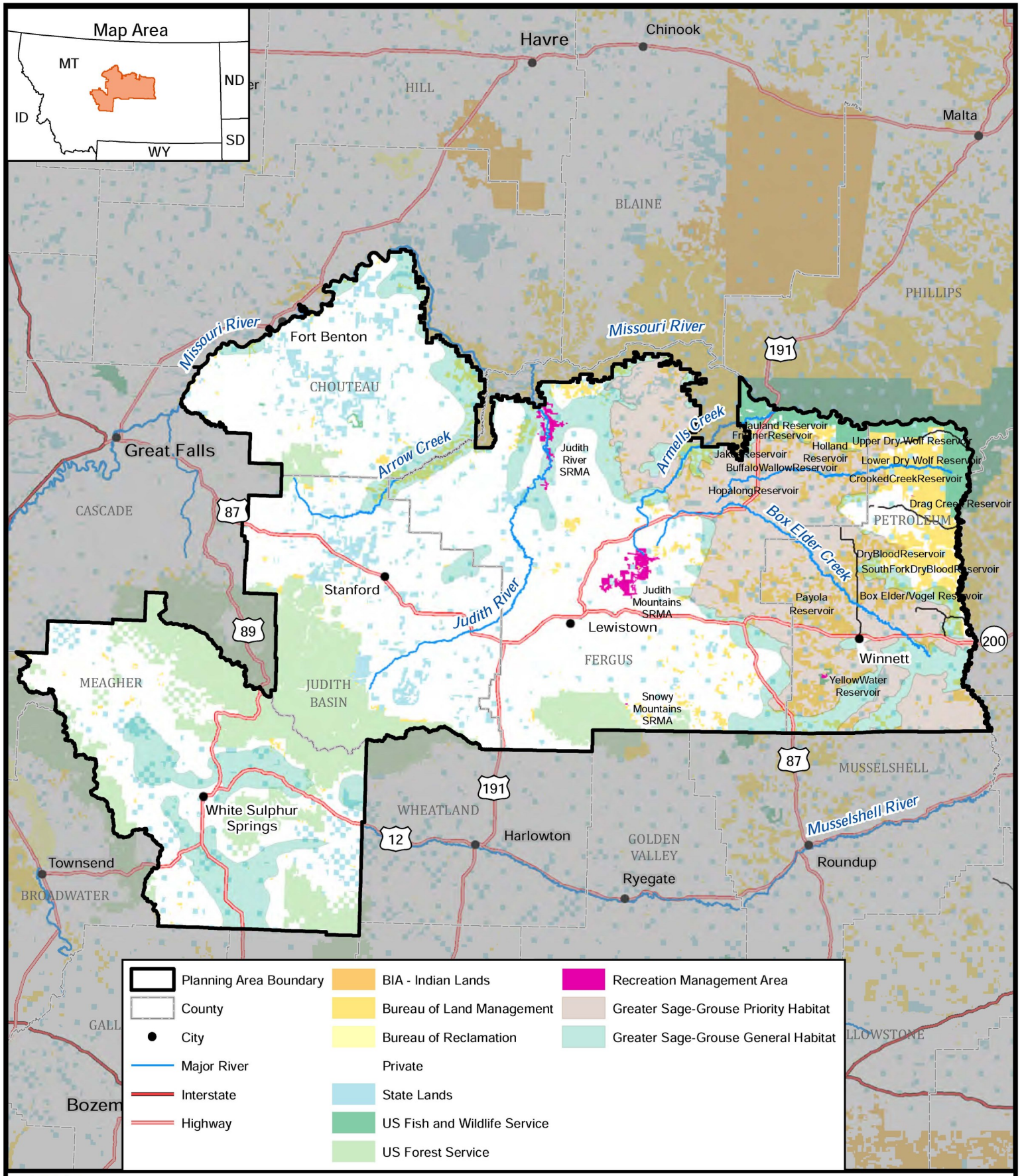
Fluid Minerals - Existing Leases

Lewistown Field Office Greater Sage-Grouse EIS

Source: BLM 2012a
Map Date: 4/23/2015

Figure 3 - 04



Recreation Management Areas

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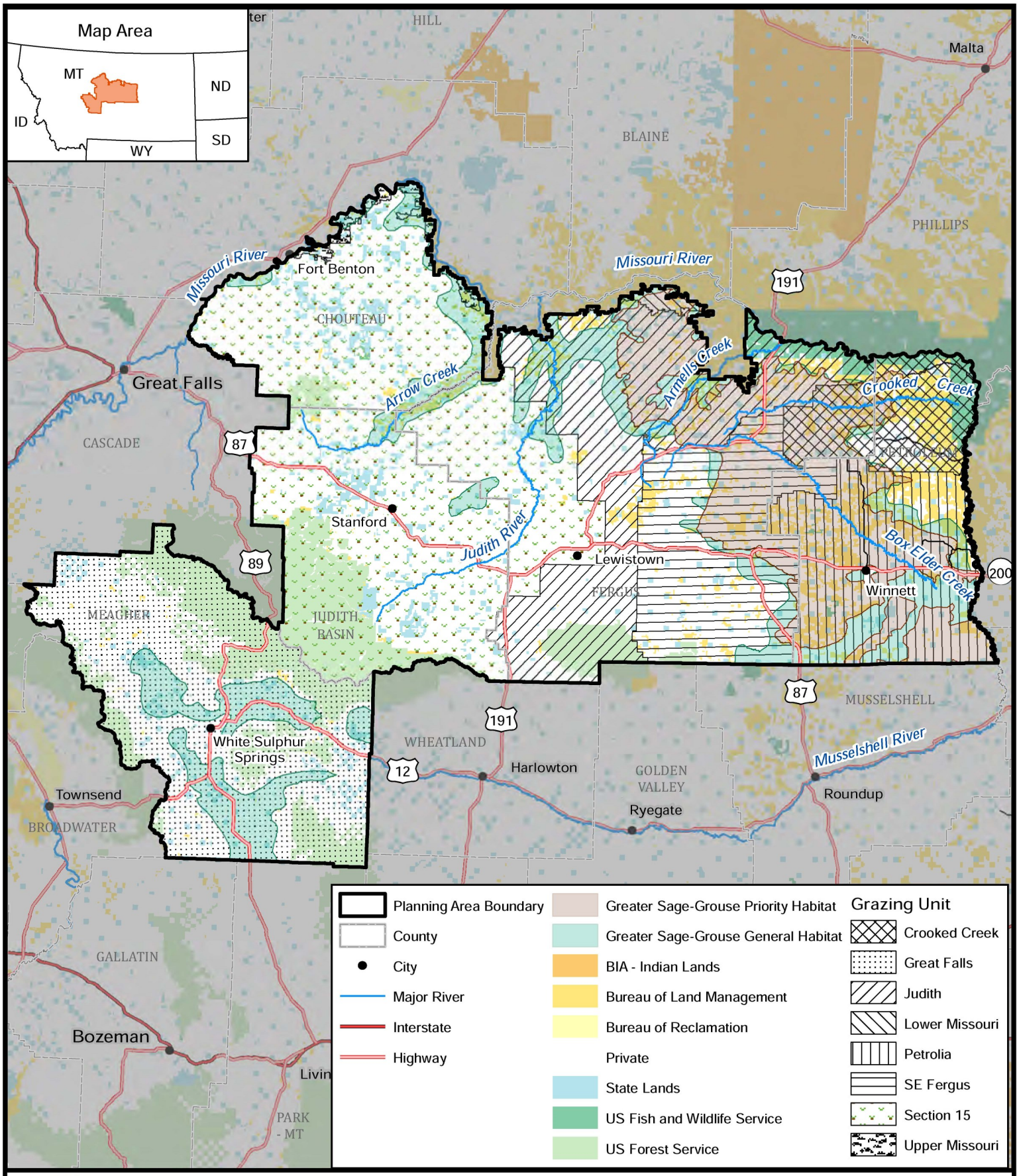
Source: BLM JVP 1992
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 05



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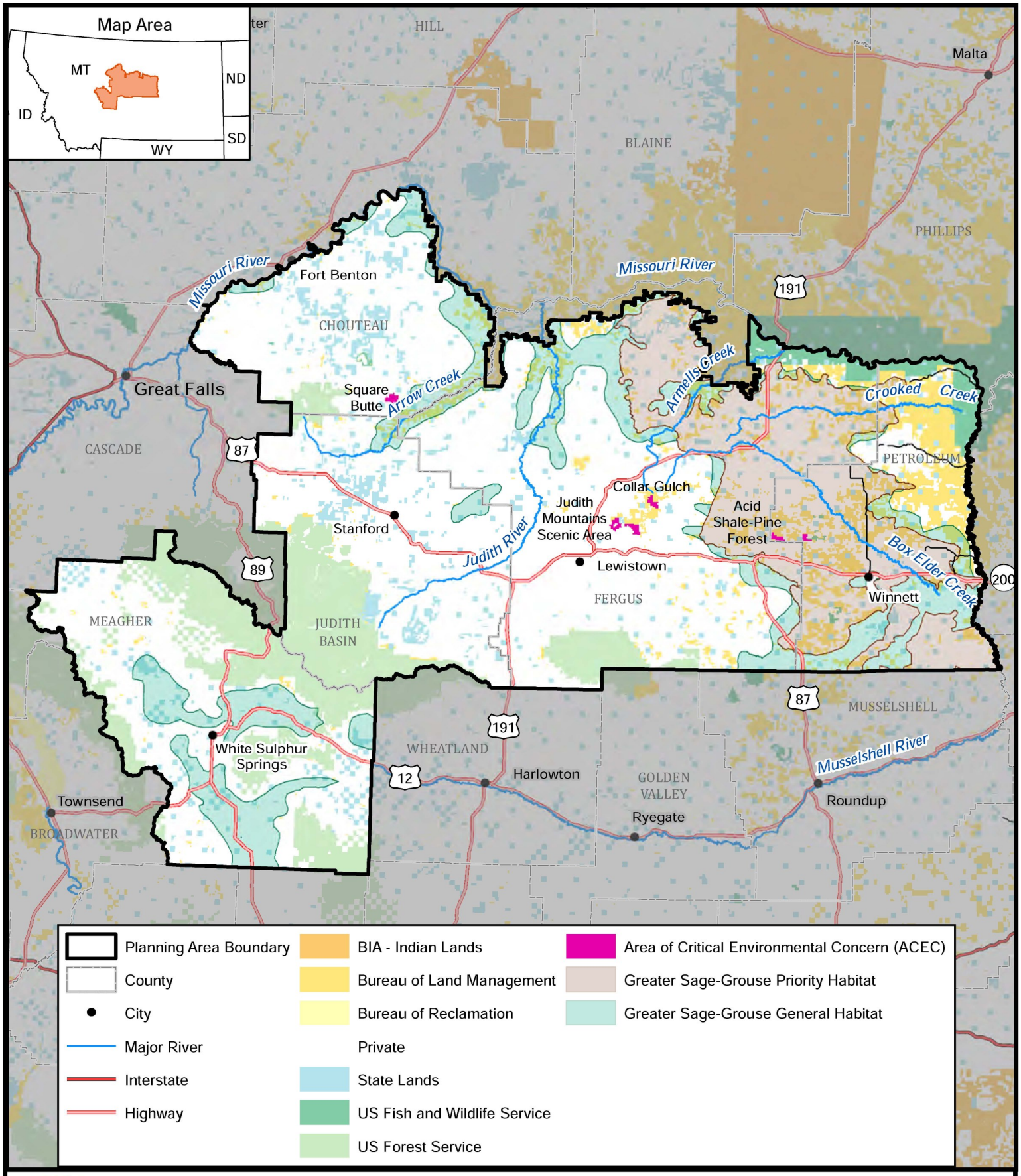
Resource Activity Plans - Grazing Authorization Renewal Areas

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 6



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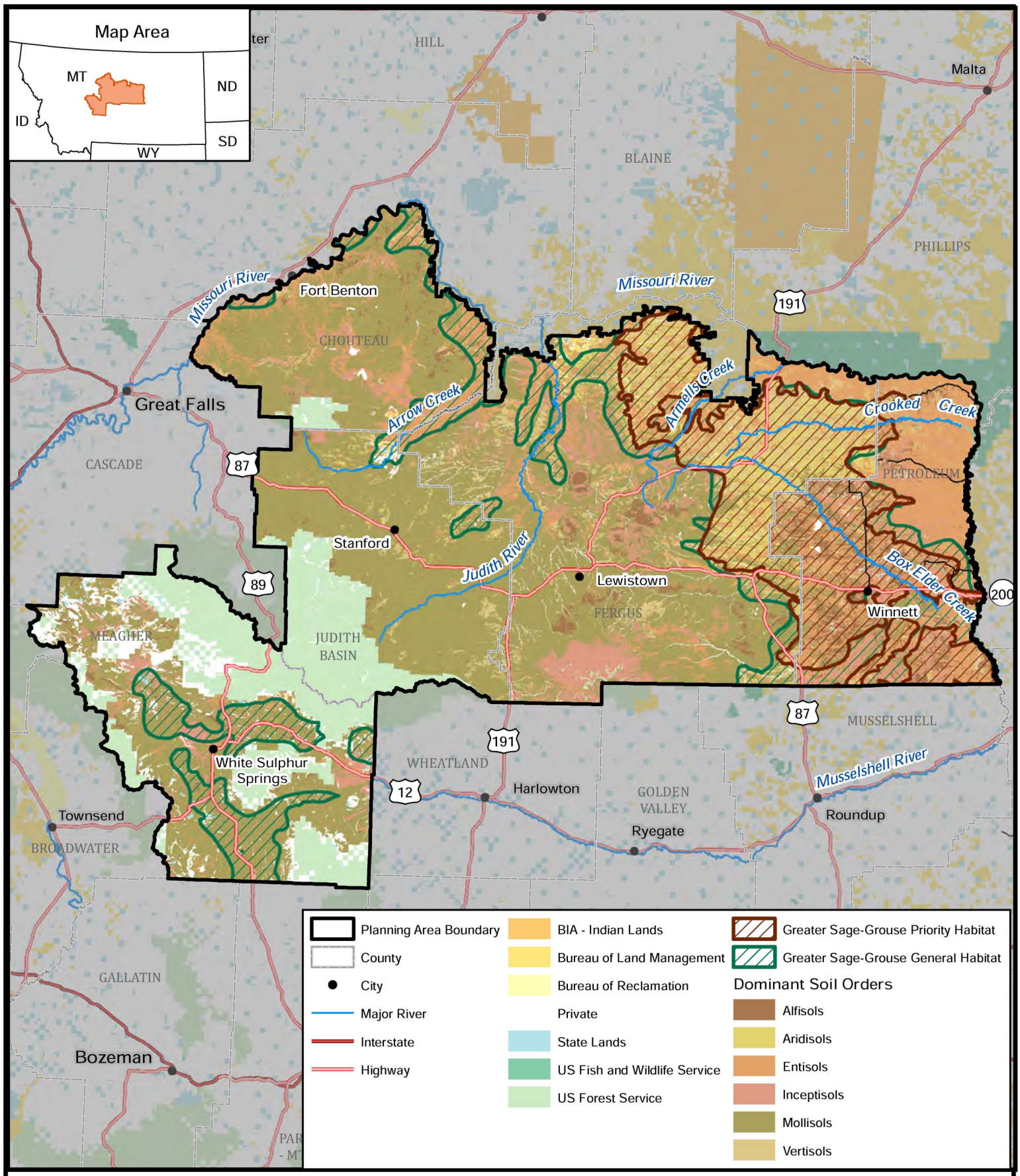
Areas of Critical Environmental Concern

Source: BLM 2012a
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 7



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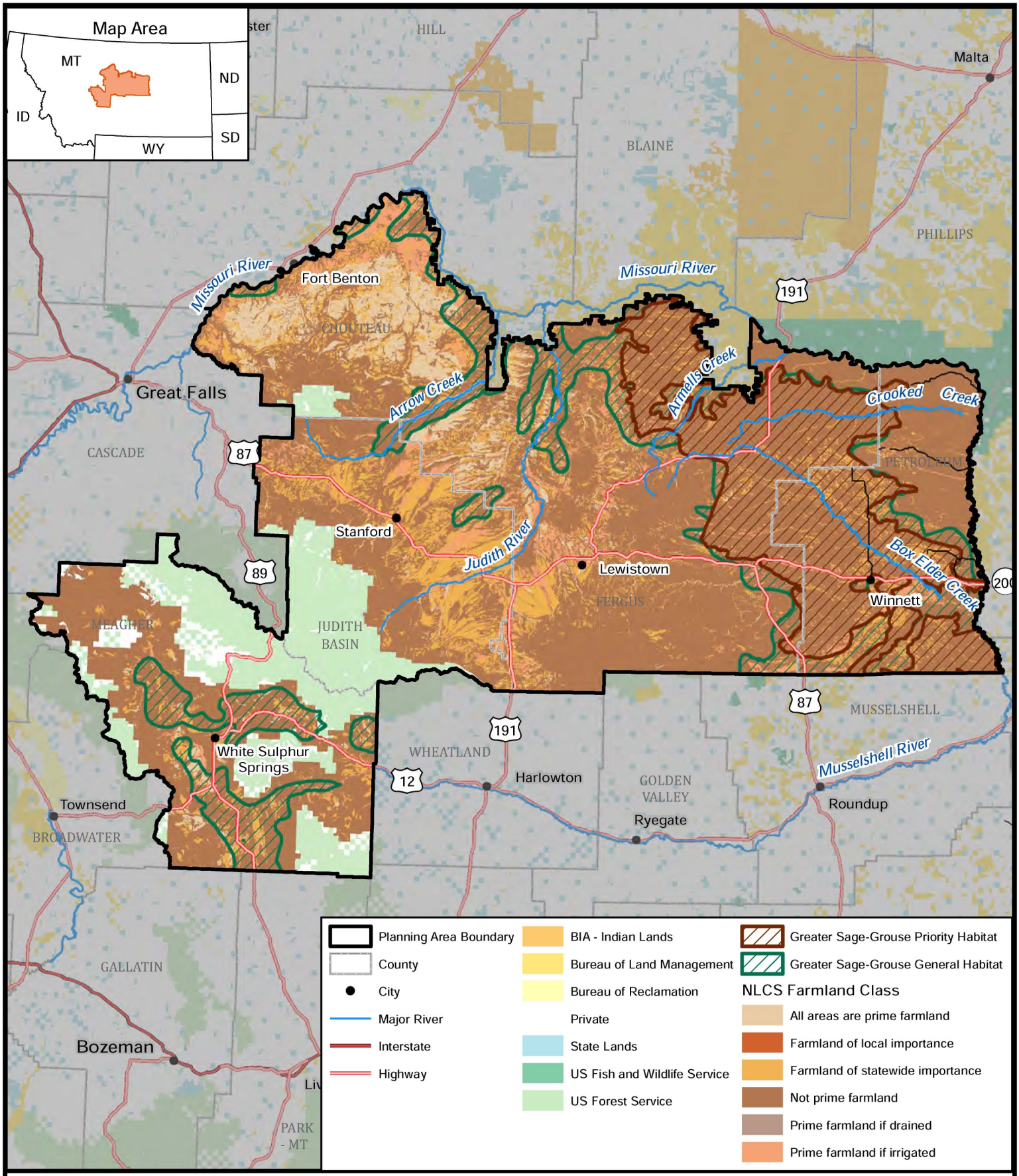
Major Soil Orders

Source: NRCS 2012

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 8



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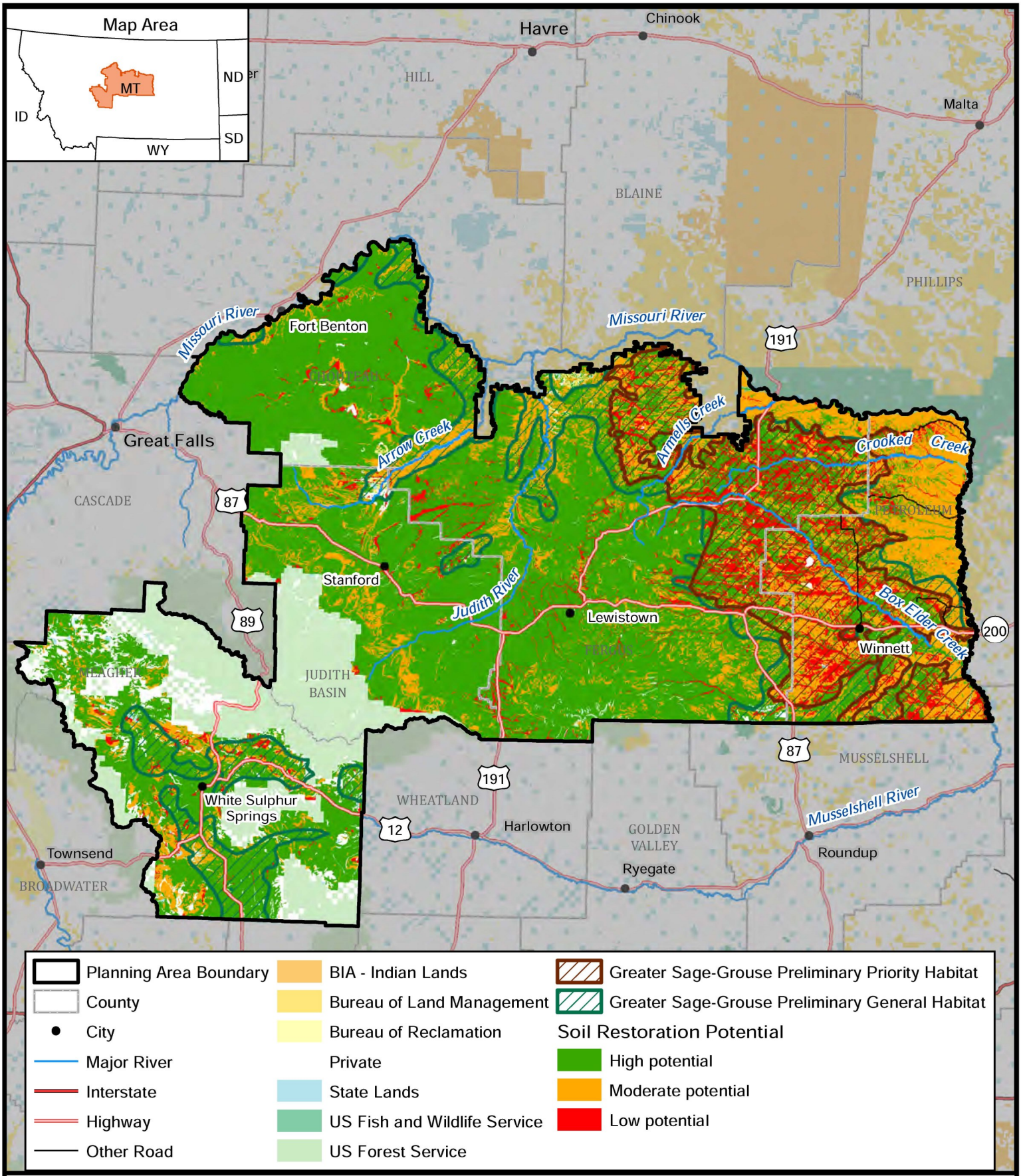
NRCS Farmland Classification

Source: NRCS 2012

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 9



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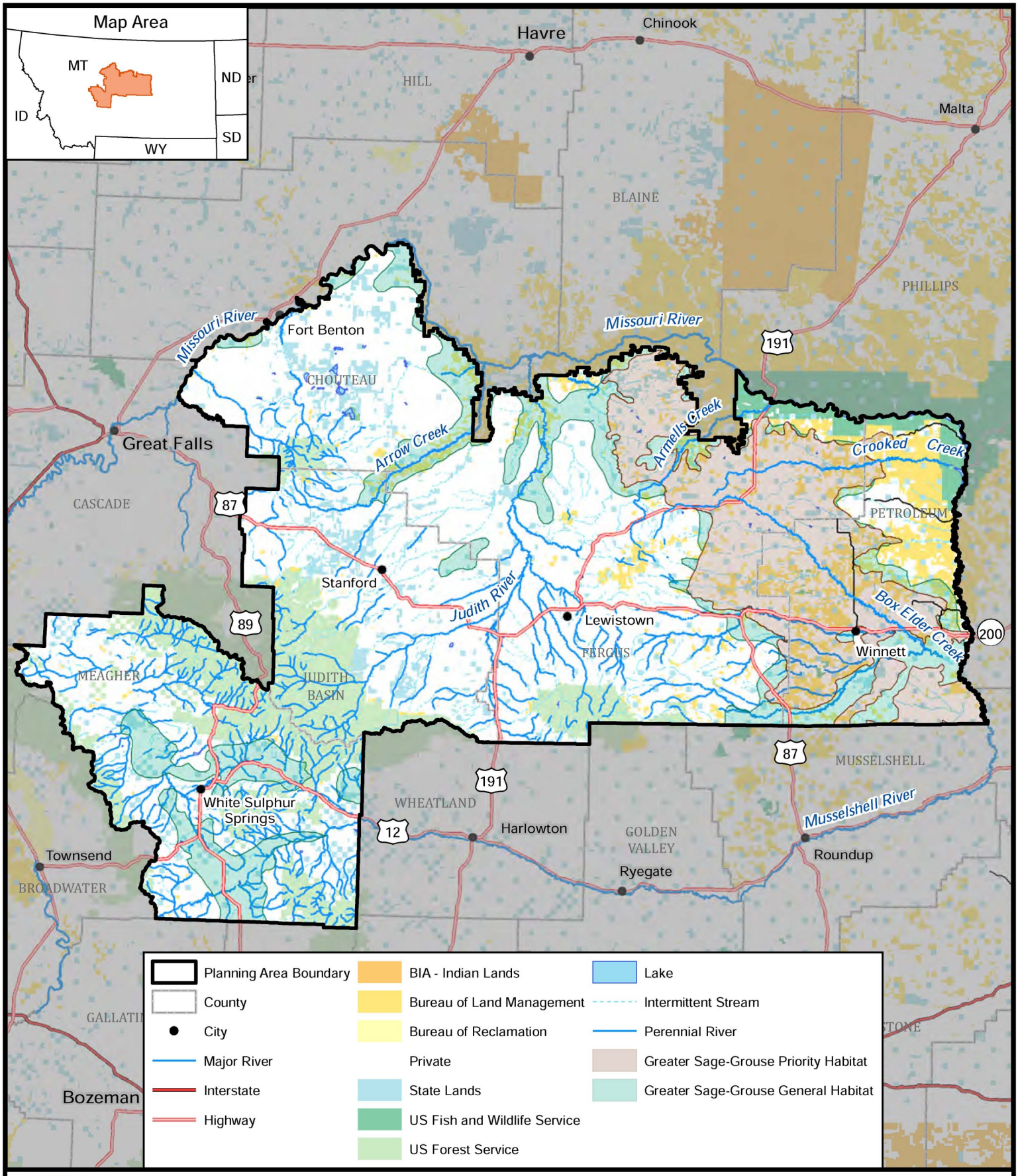
Soil Restoration Potential

Source: NRCS 2012

Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 10



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Water Features

Source: USGS NHD 2012
Map Date: 4/23/2015

Lewistown Field Office Greater Sage-Grouse EIS

Figure 3 - 11

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Appendix B

The Greater Sage-Grouse (GRSG) Monitoring Framework

APPENDIX B
THE GREATER SAGE-GROUSE (GRSG) MONITORING FRAMEWORK

B.1 INTRODUCTION

The purpose of this US Bureau of Land Management (BLM) Greater Sage-grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM planning strategy (BLM IM 2012-044) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations, based on the sensitivity of the resource to the decisions involved. Therefore, BLM will use the methods described herein to collect monitoring data to evaluate implementation and effectiveness of the Greater Sage-grouse (hereafter, sage-grouse) planning strategy and the conservation measures contained in land use plans. The type of monitoring data to be collected at the land use plan scale will be described in the monitoring plan which will be developed after the signing of the ROD. For a summary of the frequency of reporting see **Attachment A**, An Overview of Monitoring Commitments. Adaptive management will be informed by data collected at any and all scales.

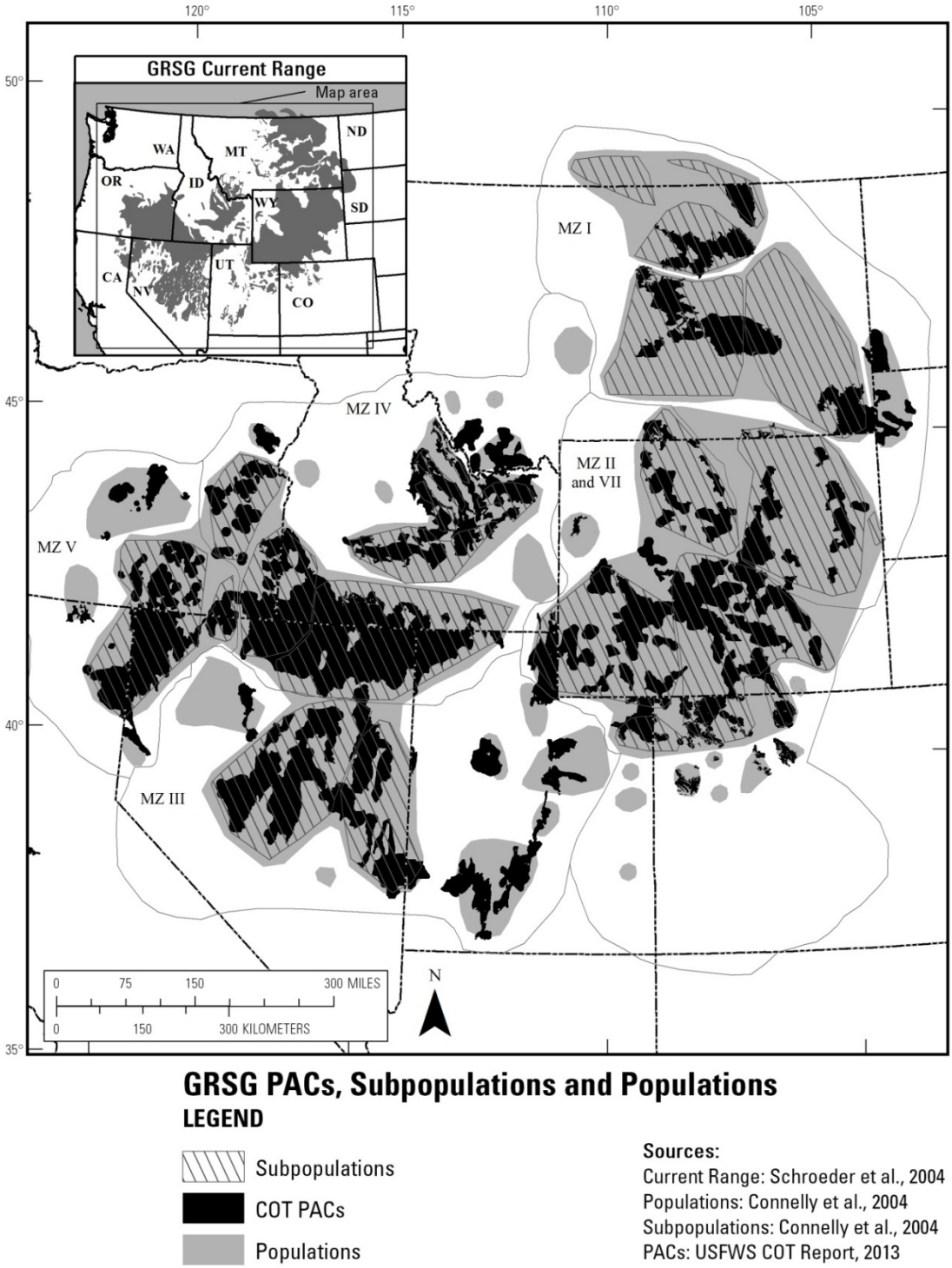
To ensure the BLM has the ability to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology for monitoring the implementation and evaluating the effectiveness of BLM actions to conserve the species and its habitat through monitoring that informs effectiveness at multiple scales. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. Implementation monitoring results will provide information to allow the BLM to evaluate the extent that decisions from the BLM resource management plans (RMP) to conserve sage-grouse and its habitat have been implemented. Population monitoring information will be

collected by state fish and wildlife agencies and will be incorporated into effectiveness monitoring as it is made available.

This multi-scale monitoring approach is necessary as sage-grouse are a landscape species and conservation is scale-dependent whereby conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and Stiver et al. (2014) as first order (broad scale), second order (mid-scale), third order (fine scale), and fourth order (site scale) to apply them to sage-grouse habitat selection. Habitat selection and habitat use by sage-grouse occurs at multiple scales and is driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat utilization by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits the ability for managers to identify the threats to sage-grouse and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see the Sage-grouse Habitat Assessment Framework (HAF; Stiver et al. *in press*).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Range wide best-available datasets for broad and mid-scale monitoring will be acquired. If these exiting datasets are not readily available or are inadequate, but are necessary to effectively inform the three measurable quantitative indicators (sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions), the BLM will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine and site scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004; **Figure B-1**, Map of greater sage-grouse range, populations, subpopulations and Priority Areas for Conservation (PACs) as of 2013). This broad and mid-scale monitoring data and analysis will provide context for RMP areas; states; priority habitat, general habitat; and Priority Areas for Conservation (PACs) as defined in the Greater Sage-grouse Conservation Objectives: Final Report (COT, US Fish and Wildlife Service 2013). Throughout the remainder of the document, all of these areas will be referred to as "sage-grouse areas".

Figure B-1
Map of greater sage-grouse range, populations, subpopulations and Priority Areas for Conservation (PACs) as of 2013.



This monitoring framework is divided into two sections. The broad and mid-scale methods, described in **Section B.2**, provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of BLM planning strategy and management decisions (see **Table B-1**, Indicators for monitoring implementation of the strategy, decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid-scales). For the sage-grouse habitat fine and site scales (**Section B.3**), this framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding, support, and dedicated personnel for broad and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of the BLM multi-scale monitoring commitments see **Attachment A**.

Table B-1
Indicators for monitoring implementation of the strategy, decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid-scales.

Geographic Scales	Implementation	Habitat		Population (State Wildlife Agencies)
		Availability	Degradation	Demographics
Broad Scale: From the range of sage-grouse to WAFWA Management Zones	BLM Planning Strategy goal and objectives	Distribution and amount of sagebrush within the range	Distribution and amount of energy, mining and infrastructure facilities	WAFWA Management Zone population trend
Mid-scale: From WAFWA Management Zone to populations. PACs	RMP decisions	Mid-scale habitat indicators (HAF 2014; **Table B.2** e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mining and infrastructure facilities (**Table B.2**)	Individual population trend

B.2 BROAD AND MID-SCALES

First order habitat selection at the broad scale describes the physical or geographical range of a species. The first order habitat, the range of the species, is defined by populations of sage-grouse associated with sagebrush landscapes based on Schroeder et al. 2004, Connelly et al. 2004 and population surveys and local adjustments based on population or habitat surveys since 2004. There is an intermediate scale between the broad and mid-scales that was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-grouse MZs. Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.

Second order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 mi^2. PACs range from 20 to 20,400 mi^2 and are nested within population areas, and populations are nested within Management Zones.

Other mid-scale landscape indicators such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*) will also be assessed. The methods used to calculate these metrics will be derived from existing literature (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011).

B.2.1 Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of land use plan decisions. The BLM will monitor implementation of project level and/or site specific actions and authorizations with their associated conditions of approval/stipulations for sage-grouse spatially (as appropriate) within priority habitat, general habitat, at a minimum, for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. These actions and authorizations as well as progress toward completing and implementing activity-level plans will be monitored consistently across all planning units and reported to BLM headquarters annually, with a summary report every five years, for this Lewistown Field Office Greater Sage-Grouse RMPA/EIS. A national-level Land Use Plan Implementation Monitoring and Reporting Structure (IMARS) that describes how the BLM will consistently and systematically monitor and report implementation level activity plans and implementation actions for all plans within the range of sage-grouse will be developed by the Implementation Monitoring Team and will be included in the Record of Decision (ROD)/Approved Plan. A centralized tracking tool (IMARS) for collection, roll-up and reporting of tabular and spatially explicit data will be utilized. BLM will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

B.2.2 Habitat Monitoring

In the USFWS's 2010 listing decision for the sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010). The BLM will therefore monitor the relative extent of these threats that remove sagebrush (see **Table B-2**, Relationship between the 18 threats and the three habitat disturbance measures for monitoring. Data availability may preclude specific analysis of individual layers), both spatially and temporally, on all lands within an analysis area, and to report on amount, pattern and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat. The three measures are:

Table B-2
Relationship between the 18 threats and the three habitat disturbance measures for monitoring. Data availability may preclude specific analysis of individual layers. See the detailed methodology for more information.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Density of Energy and Mining
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and salable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights of ways		X	

- Measure 1: Sagebrush Availability (percent of sagebrush per unit area)
- Measure 2: Habitat Degradation (percent of human activity per unit area)
- Measure 3: Density of Energy and Mining (facilities and locations per unit area)

These three habitat disturbance measures will evaluate disturbance on all lands regardless of land ownership. The direct area of influence will be assessed with the goal to account for actual removal of sagebrush upon which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape), and therefore monitors the change in sagebrush availability, or specifically where and how much of the sagebrush community is available within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability to support sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see **Section B.2.2.1**

below). Measures 2 and 3 (see **Section B.2.2.2** below) focus on where habitat degradation is occurring using the footprint/area of direct disturbance and the number of facilities at the mid-scale to identify the relative amount of degradation per geographic unit of interest and in areas that have the capability to support sagebrush and seasonal sage-grouse use. Measure 2 is not only a quantification of footprint/area of direct disturbance but also a surrogate for those threats most likely to have ongoing activity. In addition, energy development and mining activities are typically the most intensive activities in sagebrush habitat. Therefore, measure 3, the density of active energy development, production, and mining sites will be monitored to help identify areas of particular concern for factors such as noise, dust, traffic, etc., that degrade sage-grouse habitat.

The methods to monitor disturbance found herein differ slightly from methods used in the Sage-Grouse Baseline Environmental Report (BER; Manier et al. 2013) that provided a baseline of datasets of disturbance across jurisdictions. One difference is that, for some threats, the data in the BER were for federal lands only. In addition, threats were assessed individually in that report, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to utilize the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate the three measures.

B.2.2.1 Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. This measure has been divided into two sub-measures to describe sagebrush availability on the landscape:

- Measure 1a) the current amount of sagebrush on the landscape of interest and
- Measure 1b) the amount of sagebrush on the landscape of interest compared to the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic unit of interest]. The appropriate geographic units of interest for sagebrush availability include the species' range, WAFWA Management Zones, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the area of interest) will be calculated using this formula: [the existing updated sagebrush layer (EVT)] divided by [pre Euro-American geographic extent of lands that could have supported sagebrush (BpS)]. This will provide information during evaluations of monitoring data to set the context for a given geographic unit of interest. That information could also be used for management options for restoration or mitigation.

The sagebrush base layer for the sagebrush availability measure will be based on geospatial vegetation data adjusted for the threats listed in **Table B-2**. The following sub-sections of this monitoring framework describe the methodology to determine both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid-scales.

Establishing the Sagebrush Base Layer

The current geographic extent of sagebrush vegetation within the range wide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2010). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the range wide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability to support sagebrush vegetation pre Euro-American settlement [LANDFIRE Biophysical Setting (BpS)]. This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area compared with how much sagebrush existed historically (Measure 1b). Therefore, BLM have determined that LANDFIRE provides the best available data at broad and mid-scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. Along with aggregating the sagebrush types into the sagebrush base layer, BLM will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. For the long-term, BLM through its Assessment, Inventory, and Monitoring (AIM) program and specifically the BLM'S Landscape Monitoring Framework (Taylor et al., *in press*) will provide field data to the LANDFIRE program to support continuous quality improvements in their products specifically for rangeland systems to improve the LANDFIRE EVT layer.

Within the BLM, field office-wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than provided through LANDFIRE. Where available, these finer scale products are useful for additional and complimentary mid-scale indicators and local scale analyses (see **Section B.3**, Fine and Site Scale). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid-scale where consistency of data products is necessary across broader geographies.

The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of existing percent sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will be used to determine the trend in other landscape indicators, e.g. patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*). In the future, changes in sagebrush availability, generated bi-annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (see **Section B.2.4**).

Data Sources to Establish and Monitor Sagebrush Availability

In much the same manner as how the LANDFIRE data was selected as the data source, described above, the criteria for selecting the datasets (**Table B-3**, Datasets for Establishing and Monitoring Changes in Sagebrush Availability) for establishing and monitoring the change in sagebrush availability, Measure 1, were threefold:

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Dataset is continually maintained with a known update interval

Table B-3
Datasets for Establishing and Monitoring Changes in Sagebrush Availability

Dataset	Source	Update Interval	Most Recent Version Year	Use
BioPhysical Setting (BpS) v1.1	LANDFIRE	Static	2008	Denominator for Sagebrush Availability (**Section B.2.2.1**)
Existing Vegetation Type (EVT) v1.2	LANDFIRE	Static	2010	Numerator for Sagebrush Availability
Cropland Data Layer (CDL)	National Agricultural Statistics Service	Annual	2012	Agricultural Updates; removes existing sagebrush

Table B-3
Datasets for Establishing and Monitoring Changes in Sagebrush Availability

Dataset	Source	Update Interval	Most Recent Version Year	Use
	(NASS)			from numerator of sagebrush availability
National Land Cover Dataset (NLCD) Percent Imperviousness	Multi-Resolution Land Characteristics Consortium (MRLC)	5 Year	2011 available in March 2014	Urban Area Updates; removes existing sagebrush from numerator of sagebrush availability
Fire Perimeters	GeoMac	Annual	2013	< 1,000 acres Fire updates; removes existing sagebrush from numerator of sagebrush availability
Burn Severity	Monitoring Trends in Burn Severity (MTBS)	Annual	2012 available in April 2014	> 1,000 acres Fire Updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands

LANDFIRE Existing Vegetation Type (EVT) Version 1.2

LANDFIRE EVT represents existing vegetation types on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping, there have been two update efforts: version 1.1 represents changes up to 2008 and version 1.2 reflects changes on the landscape up to 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer.

Ecological systems from the LANDFIRE EVT to be used in the sagebrush base layer were determined by sage-grouse subject matter experts through the identification of the ecological systems that have the capability of supporting sagebrush vegetation and could provide suitable seasonal habitat for the sage-grouse (**Table B-4**, Ecological Systems in BpS and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-grouse). Two additional vegetation types that are not ecological systems were added to the EVT and are *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species

Table B-4
Ecological Systems in BpS and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-grouse.

Ecological System	Sagebrush Vegetation that the Ecological System has the Capability to Produce
Colorado Plateau Mixed Low Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longiloba* *Artemisia bigelovii* *Artemisia nova* *Artemisia frigida* *Artemisia tridentata* ssp. *wyomingensis*
Columbia Plateau Scabland Shrubland	*Artemisia rigida*
Great Basin Xeric Mixed Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longicaulis* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Big Sagebrush Shrubland	*Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Mixed Salt Desert Scrub	*Artemisia tridentata* ssp. *wyomingensis* *Artemisia spinescens*
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	*Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *rupicola*
Columbia Plateau Low Sagebrush Steppe	*Artemisia arbuscula* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova*
Inter-Mountain Basins Big Sagebrush Steppe	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *tripartita* *Artemisia frigida*
Inter-Mountain Basins Montane Sagebrush Steppe	*Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia nova* *Artemisia arbuscula* *Artemisia tridentata* ssp. *spiciformis*
Northwestern Great Plains Mixed grass Prairie	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *vaseyana* *Artemisia frigida*
Northwestern Great Plains Shrubland	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis*
Western Great Plains Sand Prairie	*Artemisia cana* ssp. *cana*
Western Great Plains Floodplain Systems	*Artemisia cana* ssp. *cana*
Columbia Plateau Steppe and Grassland	*Artemisia* spp.

Table B-4
Ecological Systems in BpS and EVT Capable of Supporting Sagebrush Vegetation and Could Provide Suitable Seasonal Habitat for Greater Sage-grouse.

Ecological System	Sagebrush Vegetation that the Ecological System has the Capability to Produce
Inter-Mountain Basins Semi-Desert Shrub-Steppe	*Artemisia tridentata* *Artemisia bigelovii* *Artemisia tridentata* ssp. *wyomingensis*
Rocky Mountain Lower Montane-Foothill Shrubland	*Artemisia nova* *Artemisia tridentata* *Artemisia frigida*
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	*Artemisia tridentata*
Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland	*Artemisia tridentata* ssp. *vaseyana* *Artemisia arbuscula* *Artemisia tridentata*
Artemisia tridentata ssp. *vaseyana* Shrubland Alliance (EVT only)	*Artemisia tridentata* ssp. *vaseyana*
Quercus gambelii Shrubland Alliance (EVT only)	*Artemisia tridentata*

composition directly related to the Rocky Mountain Lower Montane - Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological systems in LANDFIRE BpS. In LANDFIRE EVT however, in some map zones, the Rocky Mountain Lower Montane - Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance respectively.

Accuracy and Appropriate Use of LANDFIRE Datasets

Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in **Table B-4** will be merged into one value that represents the sagebrush base layer. By aggregating all ecological systems, the combined accuracy of the sagebrush base layer (EVT) is much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of their EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historic range of sage-grouse as defined by Schroeder (2004). **Attachment C**, User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones, lists the user and producer accuracies for the aggregated ecological systems that make up the sagebrush base layer and also defines user and producer accuracies. The aggregated sagebrush base layer for monitoring had producer accuracies ranging from 56.7% to 100% and user accuracies ranging from 57.1% to 85.7%.

LANDFIRE EVT data are not designed to be used at a local level. In reporting the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the pixel level ($30m^2$ resolution of raster data) for any reporting. The smallest geographic extent use of the data for this purpose is at the PAC level and for the smallest PACs the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer

The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL) (http://www.nass.usda.gov/research/Cropland/Release/index.htm). CDL data are generated on an annual basis with "estimated producer accuracies for large row crops from the mid 80 to mid-90 percent" depending on the State (http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Readers are referred to the NASS metadata website for specific information on accuracy (http://www.nass.usda.gov/research/Cropland/metadata/meta.htm). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes as well as non-agricultural classes. For this effort, as was also done in the Baseline Environmental Report (Manier et al. 2013), non-agricultural classes were removed from the original dataset. The excluded classes are:

> Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142), Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of CDL classifies that pixel as one of the non-ag classes listed above. The assumption is that even though individual pixels may get classified as a non-agricultural class in any given year the pixel has not necessarily been restored to a natural sagebrush community that would be included in **Table B-4**. It is further assumed that once an area has moved into agricultural use, it is unlikely that it would be restored to sagebrush, however, should that occur, the method and criteria for

adding pixels back into the sagebrush base layer would follow those found in the Restoration Updates section of this framework.

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Dataset (NLCD) Percent Imperviousness was selected as the best available dataset to be used for urban updates. These data are generated on a five-year cycle and specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel will be removed from the sagebrush base layer during the update process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, there are two reasons why this is acceptable for this process. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones because unincorporated urban areas were not being included thus leaving large chunks of urban pixels unaccounted for in this rule set. Secondly, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, it was determined to include all impervious pixels.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires all fires with sizes greater than 10 acres to be reported to GeoMac, therefore there will be many small fires less than 10 acres in size that will not be accounted for in the fire updates. In the update process using fire perimeters from GeoMac, all sagebrush pixels falling within the perimeter of fires less than 1,000 acres in size will be used to update the sagebrush layer.

MTBS was selected for use as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (http://www.mtbs.gov) is an on-going multi-year project to consistently map fire severity and fire perimeters across the US. For lands in the western US, MTBS only maps burn severity for fires greater than 1,000 acres in size. One of the burn severity classes within MTBS is an unburned to low severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter that will be retained in the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. However, not all wildfires have the same impact on the recovery of sagebrush habitat depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if

needed restoration, than the warmer, dryer sagebrush habitat. These areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of greater sage-grouse habitat (Davies et al. 2011, Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation which results in sage-grouse habitat loss include various juniper species such as Utah juniper (*Juniperus osteosperma*), western juniper (*Juniperus occidentalis*), Rocky Mountain juniper (*Juniperus scopulorum*), pinyon species including singleleaf pinyon (*Pinus monophylla*) and pinyon pine (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and Douglas-fir (*Pseudotsuga menziesii*) (Gruell et al. 1986, Grove et al. 2005, Davies et al. 2011).

A rule set for conifer encroachment was developed to be used for determination of the existing sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they have the capability of supporting the conifer species (listed above) and have the capability of supporting sagebrush vegetation. Those ecological systems (**Table B-5**, Ecological Systems with Conifers Most Likely to Encroach into Sagebrush Vegetation) were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. Sagebrush vegetation was defined as including sagebrush species (**Attachment B**, List of All Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers) that provide habitat for the greater sage-grouse and are included in the Sage-Grouse Habitat Assessment Framework. An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems and these immediately adjacent sagebrush pixels were removed from the sagebrush base layer.

Table B-5
Ecological Systems with Conifers Most Likely to Encroach into Sagebrush Vegetation

EVT Ecological Systems	Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability to Produce
Colorado Plateau Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus osteosperma* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia bigelovii* *Artemisia pygmaea*

Table B-5
Ecological Systems with Conifers Most Likely to Encroach into Sagebrush Vegetation

EVT Ecological Systems	Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability to Produce
Columbia Plateau Western Juniper Woodland and Savanna	*Juniperus occidentalis* *Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia rigida* *Artemisia tridentata* ssp. *vaseyana*
East Cascades Oak-Ponderosa Pine Forest and Woodland	*Pinus ponderosa* *Pseudotsuga menziesii* *Artemisia tridentata* *Artemisia nova*
Great Basin Pinyon-Juniper Woodland	*Pinus monophylla* *Juniperus osteosperma* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* *Artemisia tridentata* ssp. *vaseyana*
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	*Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*
Rocky Mountain Foothill Limber Pine-Juniper Woodland	*Juniperus osteosperma* *Juniperus scopulorum* *Artemisia nova* *Artemisia tridentata*
Rocky Mountain Poor-Site Lodgepole Pine Forest	*Pinus contorta* *Pseudotsuga menziesii* *Pinus ponderosa* *Artemisia tridentata*
Southern Rocky Mountain Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus monosperma* *Artemisia bigelovii* *Artemisia tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp.*vaseyana*
Southern Rocky Mountain Ponderosa Pine Woodland	*Pinus ponderosa* *Pseudotsuga menziesii* *Pinus edulis* *Pinus contorta* *Juniperus* spp. *Artemisia nova* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*

Invasive Annual Grasses Adjustments for the Sagebrush Base Layer

There are no invasive species datasets from 2010 to present (beyond the LANDFIRE data) that meet our 3 criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see the **Monitoring Sagebrush Availability** section below.

Sagebrush Restoration Adjustments for the Sagebrush Base Layer

There are no datasets from 2010 to present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (Version 1.2) due to restoration activities since 2010. Successful restoration treatments prior to 2010 are assumed to have been captured in the LANDFIRE refresh.

Monitoring Sagebrush Availability

Updating the Sagebrush Availability Sagebrush Base Layer

Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

> ***2010 Existing Sagebrush Base Layer*** = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires < 1,000 acres] minus [2009/10 MTBS Fires excluding unburned sagebrush islands] minus [Conifer Encroachment Layer]
>
> ***2012 Existing Sagebrush Update*** = [Base 2010 Existing Sagebrush Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]
>
> ***2013 and beyond Existing Sagebrush Updates*** = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] plus [restoration/monitoring data provided by the field]

Sagebrush Restoration Updates

Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper, are examples of updates to the sagebrush base layer that can add sagebrush vegetation back in. When restoration has been determined to be successful through range wide,

consistent, interagency fine and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broad and mid-scale sagebrush base layer.

Measure 1b – Context for the change in the amount of sagebrush in a landscape of interest

Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the BpS data layer that describes sagebrush pre Euro-American settlement (biophysical setting (BpS) v1.2 of LANDFIRE). This measure (1b) will provide information during evaluations of monitoring data to set the context for a given geographic area of interest. The information could also be used to inform management options for restoration, mitigation and inform effectiveness monitoring.

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (BpS) were constructed based on an approximation of the historical (pre Euro-American settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. BpS is composed of map units which are based on NatureServe's (2011) terrestrial ecological systems classification.

The ecological systems within BpS used for this monitoring framework are those ecological systems that have the capability of supporting sagebrush vegetation and could provide seasonal habitat for the sage-grouse. These ecological systems are listed in **Table B-4** with the exception of the *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and the *Quercus gambelii* Shrubland Alliance. Ecological systems selected included sagebrush species or subspecies that are included in the Sage-Grouse Habitat Assessment Framework and are found in **Attachment B**.

Attributable to the lack of any reference data, the BpS layer does not have an associated accuracy assessment. Visual inspection, however, of the BpS data reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies between map zones are the decision rules used to map a given ecological system will vary between map zones based on different physical, biological, disturbance and atmospheric regimes of the region. This can result in artificial edges in the map that are an artifact of the mapping process. However, metrics will be calculated at broad spatial scales using BpS potential vegetation type, not small groupings or individual pixels, therefore, the magnitude of these observable errors in the BpS layer is minor compared with the size of the reporting units. Therefore, since BpS will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will only have a minor impact on the percent sagebrush availability calculation.

LANDFIRE BpS data are not designed to be used at a local level. In reporting the percent sagebrush statistic for the various reporting units, the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the pixel level ($30m^2$) for any reporting. The smallest geographic extent use of the data for this purpose is at the PAC level and for the smallest PACs the initial percent sagebrush remaining estimate will have greater uncertainties compared with the much larger PACs.

Tracking

BLM will analyze and monitor sagebrush availability (Measure 1) on a bi-annual basis and it will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to fire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meets criteria of adding sagebrush areas back into the sagebrush base layer will begin to be factored in as data allows. Attributable to data availability, there will be a two year lag (approximately) between when the estimate is generated and when the data used for the estimate becomes available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans

Geospatial data used to generate the sagebrush base layer will be available through BLM's EGIS Web Portal and Geospatial Gateway or through the authoritative data source. Legacy datasets will be preserved, so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to share to help users understand the limitation of the sagebrush estimates and will be summarized spatially by map zone and included in the Portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to greatly improve overall quality of the data products primarily through the use of higher quality remote sensing datasets. Additionally, BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broad and mid-scale analyses through the Grass/Shrub mapping effort in partnership with the MRLC. The Grass/Shrub mapping effort applies the Wyoming multi-scale sagebrush habitat methodology (Homer et al. 2009) to spatially depict fractional percent cover estimates for five components range and west-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. One of the benefits of the design of these fractional cover maps is that they facilitate monitoring "with-in" class variation (e.g., examination

of declining trend in sagebrush cover for individual pixels). This "with-in" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub effort is not a substitute for fine scale monitoring, but will leverage fine scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. The earliest possible date for this evaluation will not occur until 2018 or 2019 depending on data availability.

B.2.2.2 Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in **Table B-2**. The footprint is defined as the direct area of influence of "active" energy and infrastructure and is used as a surrogate for human activity. Thus, the footprint of habitat degradation per sage-grouse area will be calculated. Although these analyses will try to summarize results at the aforementioned meaningful landscape units, some may be too small to appropriately report the metrics and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in **Table B-6**, Geospatial Data Sources for Habitat Degradation (Measure 2). Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure are detailed below. All datasets will be updated annually to monitor broad and mid-scale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be available to the USFWS.

Habitat Degradation Datasets and Assumptions:

<u>Energy (oil and gas wells and development facilities)</u>

This dataset will be a compilation of two oil and gas well databases: the proprietary IHS Enerdeq® database and the BLM Automated Fluid Minerals Support System (AFMSS) database (AFMSS data will be used to supplement the IHS data). Point data from wells active within the last ten years from IHS and producing wells from AFMSS will be considered as a 5 acre (2.0ha) footprint (BLM WO 2014) centered on the well point. Plugged and abandoned wells will be removed, though only if the date of well abandonment was prior to the first day of the reporting year (i.e. for the 2010 reporting year a well must be plugged and abandoned by 12/31/2009 to be removed).

> ***Additional Measure: Reclaimed Energy-related Degradation*** This dataset will include those wells that have been plugged and abandoned in an effort to measure energy-related degradation that has been reclaimed but not necessary fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last ten years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have

been documented to be delayed by 2-10 years from energy development activities (Harju et al. 2010), while reclamation actions may require two or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take six or more years from the point of seeding, depending on variables such as annual precipitation, annual temperature, and soil type and depth (Pyke, 2011). This ten-year period is conservative, assuming some level of habitat improvement ten years after plugging. However, research by Hemstrom et al. (2002) proposes an even longer period of greater than 100 years for recovery of sagebrush habitats even with active restoration approaches. Direct area of influence will be considered 3 acres (1.2ha) (J. Perry, personal communication February 12, 2014). This additional layer/measure could be used at the broad and mid-scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded and where further investigation at the fine or site-scale would be warranted to: (1) quantify the level of reclamation already conducted, and (2) evaluate the amount of restoration still required (for sagebrush habitat recovery). At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting *restoration* standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to fire and agriculture conversion (see **Sagebrush Restoration Updates** section). This dataset will be updated annually with new plugged and abandoned well from the IHS dataset.

Energy (coal mines)

Currently there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, US Office of Surface Mining Reclamation and Enforcement (OSMRE) coal mining permit polygons (as available), and USGS Mineral Resources Data System (MRDS) mine occurrence points. These data will inform where active coal mining may be occurring. Aerial imagery will then be used to manually digitize active coal mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from ESRI and/or Google will be utilized to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine footprints. Coal mine location data source and imagery date will be documented for each digitized coal footprint polygon at the time of creation. Sub-surface facility locations (polygon or point location as available) will also be collected, if available, and included in density calculations, and added

to the active surface activity layer as appropriate (if actual footprint can be located).

Energy (wind energy facilities)
This dataset will be a subset of the Federal Aviation Administration Digital Obstacles point file to include points where "Type_" = "WINDMILL". Direct area of influence of these point features will be measured by converting to a polygon dataset of three acres (1.2 ha) centered on each tower point (BLM Wind Energy Programmatic Environmental Impact Statement, 2005). Additionally, we will use Platts Power Plants and Generating Units database for transformer stations associated with wind energy sites.

Energy (solar energy facilities)
This dataset will include solar plants in existence or under construction as compiled with the proprietary Platts in the Power Plants and Generating Units database. The point data will be buffered to represent a three acre (1.2 ha) direct area of influence.

Energy (geothermal energy facilities)
This dataset will include geothermal plants in existence or under construction as compiled with the proprietary I.H.S and Platts (Power Plants and Generating Units) databases. The point data will be buffered to represent a three acre (1.2 ha) direct area of influence.

Mining (active developments; locatable, leasable, saleable)
This dataset will include active mining locations as compiled with the proprietary InfoMine® database. Other data sources will be evaluated as they are identified or become available. The point data will be buffered to represent a five acre (2.0 ha) direct area of influence, unless actual surface disturbance is available.

Infrastructure (roads)
This dataset will be compiled from the proprietary ESRI® StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstates, Major Roads, and Surface Streets to capture most paved and "crowned and ditched" roads while not including "two-track" and 4-wheel-drive routes. These minor roads, while not included in our broad and mid-scale monitoring, may support a volume of traffic that can have deleterious effects to sage-grouse leks. It may be appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine/project scale analysis will require more site-specific data than is identified in this monitoring framework. The direct influence area for roads will be represented by 240.2 ft., 84.0 ft., and 40.7 ft. (73.2 m, 25.6 m, and 12.4 m) total widths centered on the line feature for Interstates, Major Roads, and Surface Streets respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. *Note: this is a related but different dataset as was used in the Summary of Science, Activities, Programs, and Policies That Influence the Rangewide Conservation of Greater Sage-*

Grouse (Manier et al., 2013). Individual BLM planning units may utilize different roads layers for fine and site scale monitoring.

Infrastructure (railroads)
This dataset will be a compilation of Federal Railroad Administration (FRA) Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct influence area for railroads will be represented by a 30.8 ft. (9.4m) total width (Knick et al. 2011) centered on non-abandoned railroad line feature.

Infrastructure (power lines)
This line dataset will be a compilation from EV Energy Map, Platts/Global Energy of transmission lines, substations, electric power generation plants, and energy distribution control facilities. Linear features in the dataset attributed as "buried" will be removed from the disturbance calculation. Only "In Service" lines will be used, not "Proposed" lines. Direct area of influence will be determined by the kV designation: 1-199 kV (100 ft./30.5 m), 200-399 kV (150 ft./45.7 m), 500-699 kV (200 ft./61.0 m), and 700-or greater kV (250 ft./76.2 m) based on average ROW and structure widths.

Infrastructure (communication towers)
This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.47 acres (1.0 ha) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)
This point dataset will be compiled from the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.47 acres (1.0ha) centered on each vertical structure point (Knick et al. 2011).

Other developed rights-of-ways
Currently no additional data sources for other rights-of-ways have been identified; roads, power lines, railroads, pipelines, and other known linear features are represented in categories above. Our newly purchased IHS data does contain pipeline information, but further investigation is needed to determine if the dataset is comprehensive. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to the threats above.

Habitat Degradation Threat Combination and Calculation:
The threats targeted for measuring human activity from **Table B-2**, will be converted to direct area of influence polygons as described for each threat

above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. However, individual datasets will be preserved to ascertain which types of threats may be contributing to overall habitat degradation. Percentages will be calculated as follows: This measure has been divided into three sub-measures to describe habitat degradation on the landscape:

Measure 2a) Footprint by landscape unit: Divide area of the active/direct footprint within a sage-grouse area by the total area of the sage-grouse area. (% disturbance in landscape unit)

Measure 2b) Active/direct footprint by historic sagebrush potential: Divide area of the active footprint that coincides with areas with historic sagebrush potential (BpS calculation from habitat availability) within a given landscape unit by the total area with sagebrush potential within the landscape unit. (% disturbance on potential historic sagebrush in landscape unit)

Measure 2c) Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given landscape unit by the total area that is current sagebrush within the landscape unit. (% disturbance on current sagebrush in landscape unit)

B.2.2.3 Density of Energy and Mining (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of threats identified in **Table B-2**. This will provide an estimate of intensity of human activity or intensity of habitat degradation. The number energy facilities and mining locations will be summed and divided by the area of meaningful landscape units to calculate density of these activities. Data sources for each threat are found in **Table B-6**. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure are detailed below. All datasets will be updated annually to monitor broad and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

Table B-6
Geospatial Data Sources for Habitat Degradation (Measure 2).

USFWS Listing Decision Threat	Data Source	Direct Area of Influence
Agriculture	National Agriculture Statistics Service	Polygon Area
Urbanization	USGS Percent Imperviousness	Polygon Area
Wildfire	Geospatial Multi-Agency Coordination Group; Monitoring Trends in Burn Severity	Polygon Area

Table B-6
Geospatial Data Sources for Habitat Degradation (Measure 2).

USFWS Listing Decision Threat	Data Source	Direct Area of Influence
Conifer encroachment	LANDFIRE	Polygon Area
Energy (oil and gas wells and development facilities)	IHS; BLM (AFMSS)	5 ac (2.0 ha)
Energy (reclaimed site degradation)	IHS; BLM (AFMSS)	3 ac (1.2 ha)
Energy (coal mines)	BLM & FS data; Office of Surface Mining Reclamation and Enforcement	Polygon Area
Energy (wind towers)	Federal Aviation Administration	3 ac (1.2 ha)
Energy (solar fields)	Argonne National Laboratory	Polygon Area
Energy (geothermal)	Argonne National Laboratory	Polygon Area or 5 ac (2.0 ha)
Mining (active locatable, leasable, and salable developments)	InfoMine	Polygon Area or 5 ac (2.0 ha)
Infrastructure (roads)	ESRI StreetMap Premium	40.7-240.2 ft. (12.4-73.2 m)
Infrastructure (railroads)	Federal Railroad Administration	30.8 ft. (9.4 m)
Infrastructure (power lines)	Platts Transmission Lines	100-250 ft. (30.5-76.2 m)
Infrastructure (communication towers)	Federal Communications Commission	2.5 ac (1.0 ha)
Infrastructure (other vertical structures)	Federal Aviation Administration	2.5 ac (1.0 ha)

Density of Energy and Mining Datasets and Assumptions:

Energy (oil and gas wells and development facilities)
[See **Section B.2.2.2**]

Energy (coal mines)
[See **Section B.2.2.2**]

Energy (wind towers)
[See **Section B.2.2.2**]

Energy (solar energy facilities)
[See **Section B.2.2.2**]

Energy (geothermal energy facilities)
[See **Section B.2.2.2**]

Mining (active developments; locatable, leasable, saleable)
[See **Section B.2.2.2**]

Density of Energy and Mining Threat Combination and Calculation:
Datasets for energy and mining will be collected in two primary forms: point locations (e.g. wells) and polygon areas (e.g. surface coal mining). The following rule set will be used to calculate density for meaningful landscape units including standard grids and per polygon:

1. Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
2. Polygons will not be merged, nor features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
3. The analysis unit (polygon or 640 acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit all point features will be summed, and any individual polygons will be counted as one (e.g.; a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g. a polygon crossing multiple 640 acre sections would be counted as one in each 640 acre section for a density per 640 acre section calculation).
4. In methodologies with different sized units (e.g. MZs, populations, etc.) raw counts will be converted to densities by dividing by the total area of the unit. Typically this will be measured as facilities per 640 acres.
5. For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
6. Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help with display and conveying information about areas within meaningful landscape units that have high energy and/or mining activity.
7. Additional statistics for each defined unit may also include adjusting the area to only include area with the historic potential for sagebrush (BpS) or areas currently sagebrush (EVT).

Key habitat degradation individual datasets and threat combination datasets will be available through BLM's EGIS Web Portal and Geospatial Gateway. Legacy datasets will be preserved, so that trends may be calculated.

B.2.3 Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this

collection of annual population data by state agencies. These data will be made available to BLM through the Sage-grouse Implementation Memorandum of Understanding (2013) signed by WAFWA, BLM, NRCS, USGS, Farm Service Agency, and USFWS. An amendment to the MOU (2014) will outline a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information. The Landscape Conservation Management and Analysis Portal (LC MAP) will be used as the instrument for state wildlife agencies to annually submit population data and analyses that will be accessed by the BLM through a data sharing agreement. Population areas were refined from the Greater Sage-grouse Conservation Objectives: Final Report (COT) report by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and inform the adaptive management responses.

B.2.4 Effectiveness Monitoring

Effectiveness monitoring will provide the information to evaluate BLM actions to reach the objective of the planning strategy (BLM IM 2012-044), to conserve sage-grouse populations and its habitat, and the objectives in this Lewistown Field Office Greater Sage-Grouse RMPA/EIS. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this RMP. Effectiveness information used for these larger scale evaluations includes all-lands in the area of interest regardless of surface ownership/ management and will help inform where finer scale evaluations are needed such as population areas smaller than a RMP or PACs within a RMP (described in **Section B.3**). The information will also include the trend of disturbance within these areas of interest which informs the need to initiate adaptive management responses as described in this Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

Effectiveness monitoring reported for these larger areas provides the context to then conduct effectiveness monitoring at finer scales and helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines. These large area evaluations would not exclude the need for concurrent finer scale evaluations where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse planning strategy, the BLM will evaluate the answers to the following questions and prepare a broad and mid-scale effectiveness report:

1. Sagebrush Availability and Condition:
    a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?

b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre Euro-American historical distribution of sagebrush (BpS)?

c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?

2. Habitat Degradation and Intensity of Activities:

a. What is the amount of habitat degradation and the change in that amount?

b. What is the intensity of activities and the change in the intensity?

c. What is the amount of reclaimed energy-related degradation and the change in the amount?

3. What is the population estimation of sage-grouse and the change in the population estimation?

4. How is the BLM contributing to changes in the amount of sagebrush?

5. How is the BLM contributing to disturbance?

The compilation of broad and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule, which may be accelerated to respond to critical emerging issues (in consultation with USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and will be consistent with and inform the BLM adaptive management strategy (see "Adaptive Management" section of the EIS).

To determine the effectiveness of the sage-grouse objectives of this Lewistown Field Office Greater Sage-Grouse RMPA/EIS, the BLM will evaluate the answers to the following questions and prepare a plan effectiveness report:

1. Is this plan meeting the sage-grouse habitat objectives?

2. Are sage-grouse areas within the land use plan meeting, or making progress towards meeting, land health standards, including the Special Status Species/ wildlife habitat standard?

3. Is the plan meeting the disturbance objective(s) within sage-grouse areas?

4. Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this RMP will occur on a 5-year reporting schedule (see **Attachment A**) or more often if habitat or population anomalies identify the need for an evaluation to facilitate adaptive management

or respond to critical emerging issues. Data will be made available through the BLM's EGIS Web Portal and the Geospatial Gateway.

Methods: At the broad and mid- biological scales (PACs and above) the BLM will summarize the vegetation, disturbance, and population data (when available). Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to appropriately report the metrics and may need to be combined to provide an estimate with an acceptable level of accuracy or they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas due to successful restoration; and the amount of new disturbance the BLM has permitted. This information could be supplemented with population data to understand the correlation between habitat and PACs within a population when population data are available. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will utilize the information from Measure 1a (Section B1, Sagebrush Availability) and calculate the change from the 2012 Baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (**Section B.2.2.1,** Sagebrush Availability) will be utilized. To calculate the trend in the condition of sagebrush at the mid-scale, three sources of data will be utilized: the BLM Grass/ Shrub mapping effort (**Section B.2.2.1**, Future Plans); the results from the calculation of the landscape indicators such as patch size (described below); and the BLM Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data is collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid-scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid-scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and fragmentation at the broad and mid-scales will be utilized using the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with NRCS. The objective of the LMF effort is to provide non-biased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. *in press*), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented BLM, USFWS, WAFWA, NRCS, ARS, state wildlife agencies, and academia. The common indicators that were identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS Rangeland Monitoring Survey.

The Sage-grouse Intensification baseline data will be collected over a five year period and an annual Sage-grouse Intensification report will be prepared describing the status of the indicators. Beginning in year six, the annual status report will be accompanied with a trend report which will be available on an annual basis thereafter contingent upon continuation of the current monitoring budget. This information, in combination with the Grass/ Shrub mapping information, the mid-scale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the Planning Strategy Effectiveness Report.

Calculating Question 2, Planning Strategy Effectiveness: The amount of habitat degradation and the intensity of the activities in the area of interest will utilize the information from Measures 2 and 3 (**Section B.2.2.2**, Habitat Degradation). The amount of reclaimed energy-related degradation will be collected by the FO on plugged and abandoned and oil/gas well sites. The data will demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the Planning Strategy Effectiveness Report.

Calculating Question 3, Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (Section C, Population Monitoring) will be used to answer Question 3 of the Planning Strategy Effectiveness Report.

Calculating Question 4, Planning Strategy Effectiveness: The estimated contribution by the BLM to the change in the amount of sagebrush in the area of interest will

utilize the information from Measure 1a (**Section B.2.2.1**, Sagebrush Availability).This measure is derived from the national data sets that remove sagebrush (**Table B-2**). To determine the relative contribution of the BLM management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in area of interest. This information will be used to answer Question 4 of the Planning Strategy Effectiveness Report.

Calculating Question 5, Planning Strategy Effectiveness: The estimated contribution by the BLM to the change in the amount of disturbance in the area of interest will utilize the information from Measure 2a (**Section B.2.2.2**, Habitat Degradation, Percent) and Measure 3 **Section B.2.2.2**, Habitat Degradation, Intensity). These measures are all derived from the national disturbance data sets that degrade habitat (**Table B-2**). To determine the relative contribution of the BLM management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in area of interests. This information will be used to answer Question 5 of the Planning Strategy Effectiveness Report.

Answering the five questions that determine the effectiveness of the BLM Planning Strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad scale monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence the objectives of the Planning Strategy to maintain populations and their habitats have been met. Conversely, where information indicates sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and populations are declining relative to the baseline, there is evidence the objectives of the Planning Strategy are not being achieved. This would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

At the RMP area, the BLM will summarize the vegetation, disturbance, and population data to determine if the RMP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM surface management areas and will help inform where finer scale evaluations are needed such as seasonal habitats, corridors, or linkage areas. The information should also include the trend of disturbance within the sage-grouse areas which informs the need to initiate adaptive management responses as described in this Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting Land Health Standards in sage-grouse areas will both be used as part of the determination of the effectiveness of the RMP in meeting

the vegetation objectives in sage-grouse habitat set forth in this RMP. The collection of this data will be the responsibility of the Field Office/Ranger District. In order for this data to be consistent and comparable, common indicators, consistent methods, and a nonbiased sampling framework should be implemented following the principles in the AIM Strategy (Toevs, et al, BLM TN 440 BLM Core Indicators and Methods), in the BLM Technical Reference Interpreting Indicators of Rangeland Health (Pellant et al. 2005), and the HAF (Stiver et al. in press) or other approved WAFWA MZ consistent guidance to measure and monitor sage-grouse habitats. The analysis of this information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this RMP will be used as part of the determination of the effectiveness of the RMP in meeting the disturbance objectives set forth in this RMP. National data sets can be used to calculate the amount of disturbance, but Field Office data will likely increase the accuracy of this estimate. This information will be used to answer Question 2 of the Land Use Plan Effectiveness Report.

Calculating Question 3, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available and will part of the determination of effectiveness. This population data (**Section B.2.3**) will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the RMP will be used to inform the need for finer scales investigations, initiate Adaptive Management actions as described in Chapter 2 of the Lewistown Field Office Proposed RMPA/Final EIS, initiate causation determination, and/ or determine if changes to management decisions are warranted. The measures used at the broad and mid-scales will provide a suite of characteristics from which the effectiveness of the adaptive management strategy will be evaluated.

B.3 FINE AND SITE SCALES

Fine scale (third order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges including breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek, or lek group within a population or subpopulation area. Fine and site scale monitoring should inform RMP effectiveness monitoring (see **Section B.2.4**) and the hard and soft triggers identified in the Adaptive Management section of the Lewistown Field Office Proposed RMPA/Final EIS.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics

include canopy cover and height of sagebrush and the associated understory vegetation as well as vegetation associated with riparian areas, wet meadows, and other mesic habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (**Section B.4**), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. The need for fine and site-scale specific habitat monitoring will vary by area depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluating the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM AIM Strategy (Toevs, et. al., 2011) and AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy (Taylor, et.al., *in press*). Approved monitoring methods are:

- BLM Core Terrestrial Indicators and Methods, (MacKinnon, et. al, 2011)
- BLM Technical Reference Interpreting Indicators of Rangeland Health (Pellant et al. 2005); and
- Sage-Grouse Habitat Assessment Framework.

Other state-specific disturbance tracking models include: the BLM Wyoming Density and Disturbance Calculation Tool (http://ddct.wygisc.org/); and the BLM White River Data Management System (WRDMS) in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine and site scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the assessment, inventory and monitoring (AIM) strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF and any such adjustments should be ecologically defensible. However, to foster consistency, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for doing so and that justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site scale indicators they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies

found in the relevant area and peer reviewed by the appropriate wildlife management agency(s) and researchers.

When conducting land heath assessments, at a minimum, the BLM should follow Interpreting Indicators of Rangeland Health (Pellant, et. al., 2005) and the BLM Core Terrestrial Indicators and Methods, (MacKinnon, et. al, 2011). If the assessment is being conducted in sage-grouse areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and roll-up analysis among management units; will be useful to provide consistent data to inform the classification and interpretation of imagery; and will provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see **Section B.2.4**).

B.4 CONCLUSION

This Greater Sage-grouse Monitoring Framework was developed for all of the Final Environmental Impact Statements involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid-scales and sets the stage for BLM to collaborate with partners/other agencies to develop the Lewistown Field Office Greater Sage-Grouse RMPA/EIS Monitoring Plan using this Greater Sage-grouse Monitoring Framework as a guide.

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ATTACHMENT A: AN OVERVIEW OF MONITORING COMMITMENTS

	Broad and Mid-scales					Fine & Site Scales
	Implementation	**Sagebrush Availability**	**Habitat Degradation**	**Population**	**Effective-ness**	
How will the data be used?	Tracking and documenting implement-tation of RMP decisions and inform adaptive management	Tracking changes in land cover (sagebrush) and inform adaptive management	Tracking changes in disturbance (threats) to sage-grouse habitat and inform adaptive management	Tracking trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management	Characterizing the relationship among disturbance, implementation actions, and sagebrush metrics and inform adaptive management	Measuring seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculating disturbance and inform adaptive management
Who is collecting the data?	BLM FO	NOC and NIFC	National data sets (NOC), BLM FOs as applicable	State wildlife agencies through WAFWA	Comes from other broad and mid-scale monitoring types, analyzed by the NOC	BLM FO and SO, (with partners) including disturbance
How often are the data collected, reported and made available to USFWS?	Collected and reported annually; summary every 5 years	Updated and changes reported annually; summary reports every 5 years	Collected and changes reported annually; summary reports every 5 years	State data reported annually per WAFWA MOU; summary reports every 5 years	Collected and reported every 5 years (coincident with RMP evaluations)	Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management
What is the spatial scale?	Summarized by RMP with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by MZ, and RMP with flexibility for reporting by other units (e.g., PAC)	Variable (e.g., projects and seasonal habitats)

	Broad and Mid-scales					Fine & Site Scales
	Implemen-tation	**Sagebrush Availability**	**Habitat Degrada-tion**	**Population**	**Effective-ness**	
What are the potential personnel and budget impacts?	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	At a minimum, current skills and capacity must be maintained; data mgmt. cost are TBD	At a minimum, current skills and capacity must be maintained; data mgmt. and data layer purchase cost are TBD	No additional personnel or budget impacts for BLM	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment
Who has primary and secondary responsibilities for reporting?	BLM FO & SO BLM Planning	NOC WO	NOC BLM SO & appropriate programs	WAFWA & state wildlife agencies BLM SO, NOC	Broad and mid-scale at the NOC, RMP at BLM SO	BLM FO & SO
What new processes / tools are needed?	National implementa-tion data sets and analysis tools	Updates to national land cover data	Data standards and roll-up methods for these data	Standards in population monitoring (WAFWA)	Reporting methodologies	Data standards data storage; and reporting

ATTACHMENT B - LIST OF ALL SAGEBRUSH SPECIES AND SUBSPECIES INCLUDED IN THE SELECTION CRITERIA FOR BUILDING THE EVT AND BPS LAYERS

- *Artemisia arbuscula* subspecies *longicaulis*
- *Artemisia arbuscula* subspecies *longiloba*
- *Artemisia bigelovii*
- *Artemisia nova*
- *Artemisia papposa*
- *Artemisia pygmaea*
- *Artemisia rigida*
- *Artemisia spinescens*
- *Artemisia tripartita* subspecies *rupicola*
- *Artemisia tripartita* subspecies *tripartita*
- *Tanacetum nuttallii*
- *Artemisia cana* subspecies *bolanderi*
- *Artemisia cana* subspecies *cana*
- *Artemisia cana* subspecies *viscidula*
- *Artemisia tridentata* subspecies *wyomingensis*
- *Artemisia tridentata* subspecies *tridentata*
- *Artemisia tridentata* subspecies *vaseyana*
- *Artemisia tridentata* subspecies *spiciformis*
- *Artemisia tridentata* subspecies *xericensis*
- *Artemisia tridentata* variety *pauciflora*
- *Artemisia frigida*
- *Artemisia pedatifida*

ATTACHMENT C – USER AND PRODUCER ACCURACIES FOR AGGREGATED ECOLOGICAL SYSTEMS WITHIN LANDFIRE MAP ZONES

LANDFIRE Map Zone Name	User Accuracy	Producer Accuracy	% of Map Zone within Historic Schroeder
Wyoming Basin	76.9%	90.9%	98.5%
Snake River Plain	68.8%	85.2%	98.4%
Missouri River Plateau	57.7%	100.0%	91.3%
Grand Coulee Basin of the Columbia Plateau	80.0%	80.0%	89.3%
Wyoming Highlands	75.3%	85.9%	88.1%
Western Great Basin	69.3%	75.4%	72.9%
Blue Mountain Region of the Columbia Plateau	85.7%	88.7%	72.7%
Eastern Great Basin	62.7%	80.0%	62.8%
Northwestern Great Plains	76.5%	92.9%	46.3%
Northern Rocky Mountains	72.5%	89.2%	42.5%
Utah High Plateaus	81.8%	78.3%	41.5%
Colorado Plateau	65.3%	76.2%	28.8%
Middle Rocky Mountains	78.6%	73.3%	26.4%
Cascade Mountain Range	57.1%	88.9%	17.3%
Sierra Nevada Mountain Range	0.0%	0.0%	12.3%
Northwestern Rocky Mountains	66.7%	60.0%	7.3%
Southern Rocky Mountains	58.6%	56.7%	7.0%
Northern Cascades	75.0%	75.0%	2.6%
Mogollon Rim	66.7%	100.0%	1.7%
Death Valley Basin	0.0%	0.0%	1.2%

There are two anomalous map zones with 0% user and producer accuracies attributable to no available reference data for the ecological systems of interest.

Producer's accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if I know that a particular area is sagebrush (I've been out on the ground to check), what is the probability that the digital map will correctly identify that pixel as sagebrush? ***Omission Error*** equates to excluding a pixel that should have been included in the class (i.e., omission error = 1 - producers accuracy).

User's accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if I select any sagebrush pixel on the classified map, what is the probability that I'll be standing in a sagebrush stand when I visit that pixel location in the field? ***Commission Error*** equates to including a pixel in a class when it should have been excluded (i.e., commission error = 1 – user's accuracy).

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Appendix C

Required Design Features for Greater Sage-Grouse Habitat for Alternatives B and C

APPENDIX C
REQUIRED DESIGN FEATURES FOR GREATER SAGE-GROUSE HABITAT FOR ALTERNATIVES B AND C

INTRODUCTION

Required Design Features (RDF) are required for certain activities in all Greater Sage-Grouse (GRSG) habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF would provide no additional protection to GRSG or its habitat.

Alternatives Summary: There are no RDFs in the current Judith Resource Area and Headwaters Resource Management Plans (RMPs); therefore, Alternative A does not have any RDFs. The RDFs listed below apply where

applicable and appropriate for Alternatives B and C in the Lewistown Field Office Greater Sage-Grouse RMP Amendment/Environmental Impact Statement.

ALTERNATIVES B AND C REQUIRED DESIGN FEATURES

Required Design Features for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty (2007)

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.

7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

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REQUIRED DESIGN FEATURES FOR FLUID MINERAL DEVELOPMENT

RDFs for Priority Habitat Management Area (PHMA) in Alternative B and All GRSG Habitat in Alternative C

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among rights-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of PHMA areas. Have no tanks at well locations within PHMA (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g. a pump jack) to minimize impacts to GRSG.

- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g. by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. *In preparation*).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require GRSG-safe fences.
- Locate new compressor stations outside PHMA and design them to reduce noise that may be directed towards PHMA.

- Clean up refuse.
- Locate man camps outside of PHMA.

Reclamation

- Include objectives for ensuring habitat restoration to meet GRSG habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve GRSG habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

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Blickley, J. L., D. Blackwood, and G. L. Patricelli. In preparation. Experimental evidence for avoidance of chronic anthropogenic noise by greater sage-grouse. University of California, Davis.

Bui, T. D., J. M. Marzluff, and B. Bedrosian. 2010. "Common raven activity in relation to land use in western Wyoming: implications for greater sage-grouse reproductive success." *Condor* 112:65-78.

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Evangelista, P. H., A. W. Crall, and E. Bergquist. 2011. Invasive plants and their response to energy development. Pages 115-129 in D. E. Naugle, editor. Energy development and wildlife conservation in western North America. Island Press, Washington, DC.

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REQUIRED DESIGN FEATURES FOR FIRE & FUELS MANAGEMENT

RDFs for PHMA in Alternative B and All GRSG Habitat in Alternative C

Fuels Management

1. Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit GRSG habitat.
2. Provide training to fuels treatment personnel on GRSG biology, habitat requirements, and identification of areas utilized locally.
3. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
4. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to National Environmental Policy Act and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding GRSG seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner that promotes use by GRSG.
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.
8. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to GRSG habitat. Additionally, develop maps for GRSG habitat which spatially display current fuels treatment opportunities for suppression resources.
9. Give priority for implementing specific GRSG habitat restoration projects in annual grasslands, first to sites which are adjacent to or

surrounded by PHMA or that reestablish continuity between PHMA. Annual grasslands are a second priority for restoration when the sites are not adjacent to PHMA, but within two miles of PHMA. The third priority for annual grassland habitat restoration projects are sites beyond two miles of PHMA. The intent is to focus restoration outward from existing, intact habitat.

10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied GRSG leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PHMA or important restoration areas (such as where investments in restoration have already been made).

Fire Operations

1. Compile district-level information into state-wide GRSG tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each district, which will be aggregated into a state-wide document.
2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
3. Assign a resource advisor with GRSG expertise, or who has access to GRSG expertise, to all extended attack fires in or near GRSG habitat areas. Prior to the fire season, provide training to GRSG resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.

4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in GRSG habitat areas.
5. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.
6. During periods of multiple fires, ensure line officers are involved in setting priorities.
7. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to GRSG habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
8. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near GRSG habitat areas to minimize noxious weed spread.
9. Minimize unnecessary cross-country vehicle travel during fire operations in GRSG habitat.
10. Minimize burnout operations in key GRSG habitat areas by constructing direct fireline whenever safe and practical to do so.
11. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
12. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
13. Adequately document fire operation activities in GRSG habitat for potential follow-up coordination activities.

ALTERNATIVES B AND C SOLID MINERAL DEVELOPMENT – REQUIRED DESIGN FEATURES

Introduction

The following measures outlined would be applied as RDFs for solid minerals. For locatable minerals, the RDFs would be applied to the extent consistent with applicable laws.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.

- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:

  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Require sage-grouse-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of PHMA.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

Literature Cited

Bergquist, E., P. Evangelista, T. J. Stohlgren, and N. Alley. 2007. Invasive species and coal bed methane development in the Powder River Basin, Wyoming. Environmental Monitoring and Assessment 128:381-394.

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Appendix D

Required Design Features for Greater Sage-Grouse Habitat for Alternative D and Proposed Plan Amendment

APPENDIX D
REQUIRED DESIGN FEATURES FOR GREATER SAGE-GROUSE HABITAT FOR ALTERNATIVE D AND PROPOSED PLAN AMENDMENT

INTRODUCTION

Required Design Features (RDFs) are required for certain activities in all Greater Sage-Grouse (GRSG) habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF would provide no additional protection to GRSG or its habitat.

Alternatives Summary: There are no RDFs in the current Judith Resource Area and Headwaters Resource Management Plans (RMPs); therefore, Alternative A does not have any RDFs. The RDFs listed below apply where applicable and appropriate for Alternative D and the Proposed Plan

Amendment, in the Lewistown Field Office Greater Sage-Grouse RMP Amendment/Environmental Impact Statement.

ALTERNATIVE D REQUIRED DESIGN FEATURES

Required Design Features for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty (2007)

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.

7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

Literature Cited

De Szalay, F. A. and V. H. Resh. 2000. "Factors influencing macroinvertebrate colonization of seasonal wetlands: responses to emergent plant cover." *Freshwater Biology*. 45: 295-308.

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Knight, R. L., W. E. Walton, G. F. Meara, W. K. Riesen and R. Wass. 2003. "Strategies for effective mosquito control in constructed treatment wetlands." *Ecological Engineering*. 21: 211-232.

Schmidtmann, E. T., R. J. Bobian, R. P. Beldin. 2000. "Soil chemistries define aquatic habitats with immature populations of the *Culicoides variipennis* complex (Diptera: *Ceratopogonidae*)." *Journal of Medical Entomology*. 37: 38-64.

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REQUIRED DESIGN FEATURES FOR FLUID MINERAL DEVELOPMENT IN PRIORITY HABITAT MANAGEMENT AREA (PHMA) AND GENERAL HABITAT MANAGEMENT AREA (GHMA)

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among rights-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of PHMA. Have no tanks at well locations within PHMA (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g. a pump jack) to minimize impacts to GRSG.

- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce GRSG mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g. by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. *In preparation*).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require GRSG-safe fences.
- Locate new compressor stations outside PHMA and design them to reduce noise that may be directed towards PHMA.

- Clean up refuse.
- Locate man camps outside of PHMA.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.

Reclamation

- Include objectives for ensuring habitat restoration to meet GRSG habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve GRSG habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

Literature Cited

Blickley, J. L., D. Blackwood, and G. L. Patricelli. In preparation. Experimental evidence for avoidance of chronic anthropogenic noise by greater sage-grouse. University of California, Davis.

Bui, T. D., J. M. Marzluff, and B. Bedrosian. 2010. "Common raven activity in relation to land use in western Wyoming: implications for greater sage-grouse reproductive success." *Condor* 112:65-78.

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REQUIRED DESIGN FEATURES FOR FIRE & FUELS MANAGEMENT IN PHMA

Fuels Management

1. Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit GRSG habitat.

2. Provide training to fuels treatment personnel on GRSG biology, habitat requirements, and identification of areas utilized locally.

3. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).

4. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to National Environmental Policy Act and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding GRSG seasonal habitats and landscape.

5. Where appropriate, ensure that treatments are configured in a manner that promotes use by GRSG.

6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.

7. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.

8. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and

reduce the fire risk to GRSG habitat. Additionally, develop maps for GRSG habitat which spatially display current fuels treatment opportunities for suppression resources.

9. Give priority for implementing specific GRSG habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by PHMA or that reestablish continuity between PHMA. Annual grasslands are a second priority for restoration when the sites are not adjacent to PHMA, but within two miles of PHMA. The third priority for annual grassland habitat restoration projects are sites beyond two miles of PHMA. The intent is to focus restoration outward from existing, intact habitat.

10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.

11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.

12. Remove standing and encroaching trees within at least 100 meters of occupied GRSG leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.

13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.

14. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.

15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PHMA or important restoration areas (such as where investments in restoration have already been made).

Fire Operations

1. Compile district-level information into state-wide GRSG tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each district, which will be aggregated into a state-wide document.

2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.

3. Assign a resource advisor with GRSG expertise, or who has access to GRSG expertise, to all extended attack fires in or near GRSG habitat areas. Prior to the fire season, provide training to GRSG resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.
4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in GRSG habitat areas.
5. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.
6. During periods of multiple fires, ensure line officers are involved in setting priorities.
7. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to GRSG habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
8. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near GRSG habitat areas to minimize noxious weed spread.
9. Minimize unnecessary cross-country vehicle travel during fire operations in GRSG habitat.
10. Minimize burnout operations in key GRSG habitat areas by constructing direct fireline whenever safe and practical to do so.
11. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
12. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
13. Adequately document fire operation activities in GRSG habitat for potential follow-up coordination activities.

SOLID MINERAL DEVELOPMENT – REQUIRED DESIGN FEATURES

Introduction

The following measures outlined would be applied as RDFs for solid minerals. For locatable minerals, the RDFs would be applied to the extent consistent with applicable laws.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).

- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Require sage-grouse-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of PHMA.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

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Gelbard, J. L., and J. Belnap. 2003. Roads as conduits for exotic plant invasions in a semiarid landscape. Conservation Biology 17:420-432.

ADDITIONAL SOLID MINERAL DEVELOPMENT RDFS TO BE IMPLEMENTED

- Recommend minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on GRSG habitats. Apply these measures during activity level planning.
- Encourage development in incremental stages to stagger disturbance; design schedules that include long-term strategies to localize disturbance and recovery within established zones over a staggered timeframe.
- Use off-site mitigation or purchase conservation easements with industry dollars to offset habitat losses.
- Remove facilities and infrastructure when use is completed.
- Allow no surface use in nesting habitat from March 1 through June 15.
- Restrict maintenance and related activities in GRSG breeding/nesting complexes – March 1 through June 15 – between the hours of 4:00 – 8:00 a.m. and 7:00 – 10:00 p.m.
- Allow no surface use activities within GRSG wintering areas from December 1 through March 31.
- Use minimal surface disturbance to install roads and pipelines and reclaim site of abandoned wells to natural communities.
- Locate storage facilities, generators, and holding tanks outside the line of sight and sound of breeding habitat.
- See conservation actions related to preventing the spread of weeds and controlling infestations of noxious weeds.
- Engage industry as a partner to develop and establish new sources of seed of native plant species for restoration of sites disturbed by development.
- Design impoundments and manage discharge so as not to degrade or inundate leks, nesting sites, and wintering sites.

- Protect natural springs from any source of disturbance or degradation from energy-related activities.
- Provide for long-term monitoring of siting requirements to examine effects of current and future development on GRSG.
- Set up a schedule for reviewing and revising siting and use criteria with industry.

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Appendix E

Area of Critical Environmental Concern Evaluation of Relevance and Importance Criteria

APPENDIX E
AREA OF CRITICAL ENVIRONMENTAL CONCERN EVALUATION OF RELEVANCE AND IMPORTANCE CRITERIA

Areas of Critical Environmental Concern (ACECs) are BLM-administered lands where special management attention is needed to protect important and relevant values. Special management attention refers to management prescriptions developed during preparation of a resource management plan (RMP) or RMP amendment (RMPA) expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP, including proposed actions deemed to be in conformance with the terms, conditions, and decisions of the RMP (BLM Manual 1613).

To be a potential ACEC, a nominated area must meet the criteria of relevance and importance as outlined in 43 CFR 1610.7-2 and BLM Manual 1613. If the relevance and importance criteria are met, an area must be identified as a potential ACEC and considered for designation and management in the resource planning process. Designation is based on whether or not a potential ACEC requires special management attention in the selected plan alternative.

An area meets the "**relevance**" criteria if it contains one or more of the following relevance values:

- A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).
- A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species or habitat essential for maintaining species diversity).

- A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities, which are terrestrial, aquatic, or riparian; or rare geological features).
- Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the "**importance**" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

- More than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.
- Qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.
- Recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of the Federal Land Policy and Management Act (FLPMA).
- Qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.
- Poses a significant threat to human life and safety, or to property.

Because the importance criteria are subjective, it is essential to create common assumptions on how they are applied by the RMPA. The facts on the ground need to support the decisions made. BLM, working with Montana Fish, Wildlife, and Parks (MFWP), has developed preliminary priority habitat (PPH) maps, displaying habitat that has been identified as the most important to the long-term viability of the Greater Sage-Grouse (GRSG).

In response to the "Notice of Intent to Prepare Environmental Impact Statements To Incorporate Greater Sage-grouse Conservation Measures Into Land Use Plans and Land Management Plans" (76 Fed. Reg. 77008), the BLM received an ACEC nomination for GRSG that was considered in this planning process. This report presents the completed evaluation form for the nominated ACEC in the planning area (**Table E-1**). An ACEC that meets both relevance and importance criteria is included in at least one management alternative

Table E-1
Greater Sage-Grouse Relevance and Importance Evaluation

Area Considered: Fergus and Petroleum Counties, Montana (counties within the Lewistown Field Office (LFO) that contain preliminary priority habitat [PPH])		
General Location: BLM-administered lands managed by the LFO in the north central portion of Montana		
General Description: Priority habitat areas for Greater Sage-Grouse (GRSG) with at least 4,000 acres of contiguous BLM surface ownership		
Acreage: 96,246 acres		
Values Considered: GRSG priority habitat		
Relevance Value	**Yes/No**	**Rationale for Determination**
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate and are similar to those of many other areas in the planning area.
A fish and wildlife resource	Yes	The nomination meets the relevance criterion for wildlife resources. The nominated area provides habitat for GRSG, a BLM sensitive species, and the area has also been identified as PPH by Montana Fish, Wildlife and Parks (MFWP) and BLM.
A natural process or system	Yes	The nomination also meets the criterion for a natural system or process because of the condition of the sagebrush habitat in portions of the nomination area.
Natural hazards	No	No natural hazards are known.
Importance Value	**Yes/No**	**Rationale for Determination**
More than locally significant qualities	No	Although the area contains habitat for GRSG conservation as noted in the nomination material, the area is not significantly unique or more important than other habitat areas in this region. GRSG are distributed throughout the western United States. The portion of the distribution in Montana, Wyoming, North Dakota, South Dakota, Alberta, and Saskatchewan are designated as Western Association of Fish and Wildlife Agencies Management Zone I (Stiver et al. 2006). While all of these areas are considered important to GRSG conservation, the areas are dispersed throughout the region and are not significantly unique to a specific region or planning unit. In addition, GRSG habitat in these core areas is owned by a number of different entities and habitat on BLM-administered lands is not distinct from habitat managed by other ownership.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	Yes	Satisfies national priority concerns.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

analyzed in the RMPA/environmental impact statement. The attached map identifies the locations of the nominated ACEC.

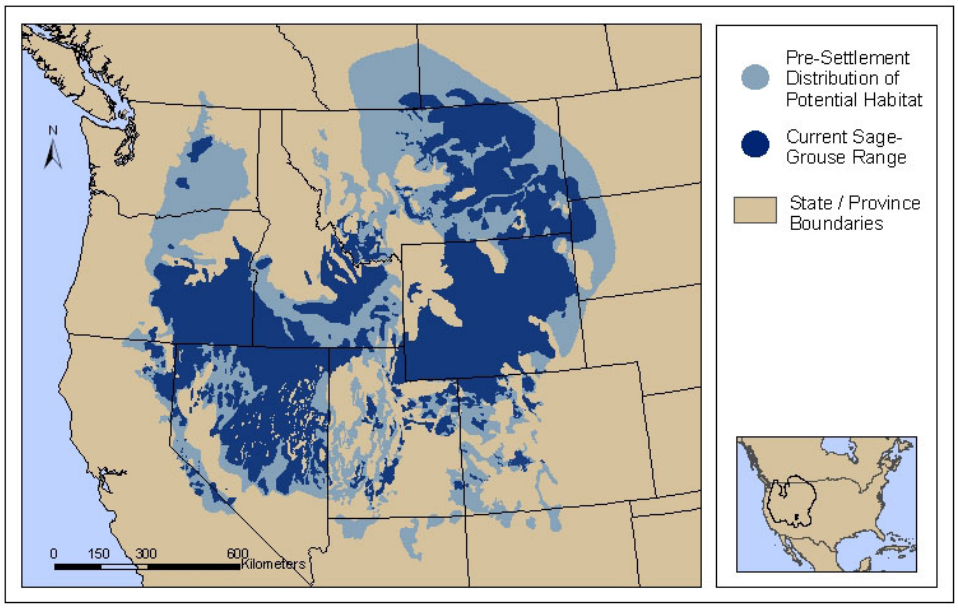
Whether a particular ACEC nomination meets the relevance and importance criteria depends on the specific facts of each area. GRSG conservation is a national priority, and PPH has been recognized as having the highest conservation value to maintaining sustainable populations. This appendix documents and substantiates how the ACEC nomination meets the existing relevance and importance criteria.

A finding that the ACEC nomination meets the relevance and importance criteria does not mean that it requires special management attention or will be designated as an ACEC. However, it does mean that the ACEC nomination will be carried forward for the development of management prescriptions in at least one alternative.

BACKGROUND INFORMATION

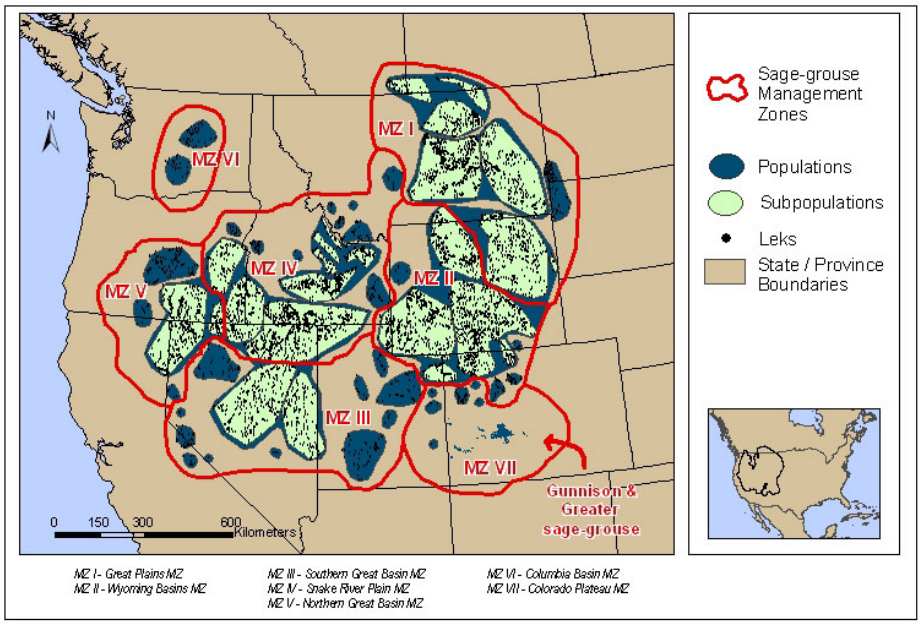
GRSG are distributed throughout the western United States (**Figure E-1**). The portion of the distribution within the planning area being considered for ACEC designations is located within Western Association of Fish and Wildlife Agencies Management Zone I (**Figure E-2**) (Stiver, et al. 2006). Management Zone I includes all of Montana (except the Dillon Field Office), North Dakota, South Dakota, and northeastern Wyoming. Management zones are delineations of GRSG populations and sub-populations within floristic zones with similar management issues. Within Management Zone I in Montana, MFWP designated core areas (MFWP 2009). In addition, Montana Audubon has also designated five important bird areas for sage-steppe associated birds, including GRSG, in Montana, most of which are contained within the MFWP core areas.

Figure E-1
Greater Sage-Grouse Distribution



Source: Stiver, et al. 2006

Figure E-2
Greater Sage-Grouse Management Zones



Source: Stiver, et al. 2006

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Appendix F

Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management for Montana and the Dakotas

Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management for Montana and the Dakotas

Note: These standards and guidelines apply to the Lewistown and Malta Field Offices

Standards

Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Achieving or making significant and measurable progress towards these functions and conditions is required of all uses of public rangelands. Historical data, when available, should be used when assessing progress towards these standards.

Lewistown STANDARD #1: Uplands are in proper functioning condition.

This means that soils are stable and provide for capture, storage and safe release of water appropriate to soil type, climate and landform. The amount and distribution of ground cover (i.e., litter, live and standing dead vegetation, microbiotic crusts, and rock/gravel) for identified ecological site(s) or soil-plant associations are appropriate for soil stability.

Evidence of accelerated erosion in the form of rills and/or gullies, erosional pedestals, flow patterns, physical soil crusts/surface scaling and compaction layers below the soil surface is minimal. Ecological processes including hydrologic cycle, nutrient cycle and energy flow are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential and there is a diversity of species characteristic of and appropriate to the site. Assessing proper functioning conditions will consider use of historical data.

- As indicated by

  Physical Environment

  - erosional flow patterns;
  - surface litter;
  - soil movement by water and wind;
  - soil crusting and surface sealing;
  - compaction layer;
  - rills;
  - gullies;
  - cover amount; and
  - cover distribution.

  Biotic Environment

  - community richness;
  - community structure;
  - exotic plants;
  - plant status;
  - seed production;
  - recruitment; and
  - nutrient cycle.

Lewistown STANDARD #2: Riparian and wetland areas are in proper functioning condition.

This means that the functioning condition of riparian-wetland areas is a result of the interaction among geology, soil, water and vegetation. Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid flood plain development; improve flood water retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for native fish production, waterfowl breeding, and other uses appropriate for the area that will support greater species richness.

The riparian-wetland vegetation is a mosaic of species richness and community structure serving to control erosion, shade water, provide thermal protection, filter sediment, aid flood plain development, dissipate energy, delay flood water, and increase recharge of groundwater where appropriate to landform. The stream channels and flood plain dissipate energy of high waterflows and transport sediment appropriate for the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity), climate, and landform. Soils support appropriate riparian-wetland vegetation, allowing water movement, filtering sediment, and slowing ground water movement for later release. Stream channels are not entrenching beyond natural climatic variations and water levels maintain appropriate riparian-wetland species.

Riparian areas are defined as land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil. Assessing proper functioning conditions will consider use of historical data.

- As indicated by:

  Hydrologic

  - flood plain inundated in relatively frequent events (1-3 years);
  - amount of altered streambanks;
  - sinuosity, width/depth ratio, and gradient are in-balance with the landscape setting (i.e., landform, geology, and bioclimatic region); and
  - upland watershed not contributing to riparian degradation.

  Erosion Deposition

  - plain and channel characteristics; i.e., rocks, coarse and/or woody debris adequate to dissipate energy;
  - point bars are being created and older point bars are being vegetated;
  - lateral stream movement is associated with natural sinuosity;
  - system is vertically stable; and
  - stream is in balance with water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition).

  Vegetation

  - reproduction and diverse age class of vegetation;
  - diverse composition of vegetation;
  - species present indicate maintenance of riparian soil moisture characteristics;
  - streambank vegetation is comprised of those plants or plant communities that have deep binding root masses capable of withstanding high streamflow events;
  - utilization of trees and shrubs;

- riparian plants exhibit high vigor;
- adequate vegetative cover present to protect banks and dissipate energy during high flows; and
- where appropriate, plant communities in the riparian area are an adequate source of woody debris.

Lewistown STANDARD #3: Water quality meets Montana State standards.

This means that surface and groundwater on public lands fully support designated beneficial uses described in the Montana Water Quality Standards. Assessing proper functioning conditions will consider use of historical data.

- As indicated by
  - dissolved oxygen concentration;
  - pH;
  - turbidity;
  - temperature;
  - fecal coliform;
  - sediment;
  - color;
  - toxins; and
  - others: ammonia, barium, boron, chlorides, chromium, cyanide, endosulfan, lindane, nitrates, phenols, phosphorus, sodium, sulfates, etc.

Lewistown STANDARD #4: Air quality meets Montana State standards.

This means that air quality on public lands helps meet the goals set out in the State of Montana Air Quality Implementation Plan. Efforts will be made to limit unnecessary emissions from existing and new point or nonpoint sources.

The BLM management actions or use authorizations do not contribute to air pollution that violates the quantitative or narrative Montana Air Quality Standards or contributes to deterioration of air quality in selected class area.

- As indicated by:
  - Section 176(c) Clean Air Act which states that activities of all federal agencies must conform to the intent of the appropriate State Air Quality Implementation Plan and not:
    - cause or contribute to any violations of ambient air quality standards;
    - increase the frequency of any existing violations; and
    - impede the State's progress in meeting their air quality goals.

Lewistown STANDARD #5: Habitats are provided to maintain healthy, productive and diverse populations of native plant and animal species, including special status species (federally threatened, endangered, candidate or Montana species of special concern as defined in BLM Manual 6840, Special Status Species Management).

This means that native plant and animal communities will be maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant lifeforms. Where native communities exist, the conversion to exotic communities after disturbance will be minimized. Management for indigenous vegetation and animals is a priority. Ecological processes including hydrologic cycle, and energy flow, and plant succession are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential, and there is a diversity of plant and animal species characteristic of and

appropriate to the site. The environment contains components necessary to support viable populations of a sensitive/threatened and endangered species in a given area relative to site potential. Viable populations are wildlife or plant populations that contain an adequate number of reproductive individuals distributed on the landscape to ensure the long-term existence of the species. Assessing proper functioning conditions will consider use of historical data.

- As indicated by:
  - plants and animals are diverse, vigorous and reproducing satisfactorily noxious weeds are absent or insignificant in the overall plant community;
  - spatial distribution of species is suitable to ensure reproductive capability and recovery;
  - a variety of age classes are present;
  - connectivity of habitat or presence of corridors prevents habitat fragmentation;
  - species richness (including plants, animals, insects and microbes) are represented; and
  - plant communities in a variety of successional stages are represented across the landscape.

Grazing Management Guidelines

Guidelines for management of herbivory (including domestic animals and wildlife) are preferred or advisable approaches to ensure that standards can be met or that significant progress can be made toward meeting the standard(s). Responsible state and Federal wildlife agencies must be involved in this management if standards are to be achieved.

Guidelines are provided to maintain or improve resource conditions in upland and riparian habitats. In both riparian and upland habitats, these guidelines focus on establishing and maintaining proper functioning conditions. The application of these guidelines is dependent on individual management objectives. Desired future conditions in plant communities and streambank characteristics will be determined on a case-by-case basis.

Lewistown GUIDELINE #1:

Grazing will be managed in a manner that will maintain the proper balance between soils, water, and vegetation over time. This balance varies with location and management objectives, historic use, and natural fluctuations, but acceptable levels of use can be developed that are compatible with resource objectives.

Lewistown GUIDELINE #2:

Manage grazing to maintain watershed vegetation, species richness, and flood plain function. Maintain riparian vegetative cover and structure to trap and hold sediments during run-off events to build streambanks, recharge aquifers, and dissipate flood energy. Grazing management should promote deep-rooted herbaceous vegetation to enhance streambank stability. Where non-native species are contributing to proper functioning conditions, they are acceptable. Where potential for palatable woody shrub species (willows, dogwood, etc.) exists, promote their growth and expansion within riparian zones.

Lewistown GUIDELINE #3:

Pastures and allotments will be managed based on their sensitivity and suitability for livestock grazing. Where determinations have not been previously documented, suitability for grazing will be determined by: topography, slope, distance from water, vegetation habitat types, and soil types must be considered when determining grazing suitability. Unsuitable areas should be excluded from grazing.

Lewistown GUIDELINE #4:

Management strategies for livestock grazing will ensure that long-term resource capabilities can be sustained. End of season stubble heights, streambank moisture content, and utilization of herbaceous and woody vegetation are critical factors which must be evaluated in any grazing strategy. These considerations are essential to achieving long-term vegetation or stream channel objectives and should be identified on a site-specific basis and used as terms and conditions.

Lewistown GUIDELINE #5:

Grazing will be managed to promote desired plants and plant communities of various age classes, based on the rate and physiological conditions of plant growth. Management approaches will be identified on a site-specific basis and implemented through terms and conditions. Caution should be used to avoid early spring grazing use when soils and streambanks are wet and susceptible to compaction and physical damage that occurs with animal trampling. Likewise, late summer and fall treatments in woody shrub communities should be monitored closely to avoid excessive utilization.

Lewistown GUIDELINE #6:

The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect the ecological functions and processes of those sites.

Lewistown GUIDELINE #7:

Locate facilities (e.g., corrals, water developments) away from riparian-wetland areas.

Lewistown GUIDELINE #8:

When provided, supplemental salt and minerals should not be placed adjacent to watering locations or in riparian-wetland areas so not to adversely impact streambank stability, riparian vegetation, water quality, or other sensitive areas (i.e., key wildlife wintering areas). Salt and minerals should be placed in upland sites to draw livestock away from watering areas or other sensitive areas and to contribute to more uniform grazing distribution.

Lewistown GUIDELINE #9:

Noxious weed control is essential and should include: cooperative agreements, public education, and integrated pest management (mechanical, biological, chemical).

Lewistown GUIDELINE #10:

Livestock management should utilize practices such as those referenced by the NRCS published prescribed grazing technical guide to maintain, restore or enhance water quality.

Lewistown GUIDELINE #11:

Grazing management should maintain or improve habitat for federally listed threatened, endangered, and sensitive plant and animals.

Lewistown GUIDELINE #12:

Grazing management should maintain or promote the physical and biological conditions to sustain native populations and communities.

Lewistown GUIDELINE #13:

Grazing management should give priority to native species. Non-native plant species should only be used in those situations where native seed is not readily available in sufficient quantities, where native plant species cannot maintain or achieve the standards, or where non-native plant species provide an alternative for the management and protection of native rangelands.

Lewistown GUIDELINE #14:

Allotment monitoring determines how on-going management practices are affecting the rangeland. To do so, the evaluations should be based on: measurable management objectives; permanent and/or repeatable monitoring locations; and short-term and long-term data.

Appendix G

Regional Mitigation Strategy

APPENDIX G
REGIONAL MITIGATION STRATEGY

GENERAL

In undertaking US Department of the Interior, Bureau of Land Management (BLM) management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. "Actions which result in habitat loss and degradation" include those identified as threats which contribute to Greater Sage-Grouse (GRSG) disturbance as identified by the US Fish and Wildlife Service (USFWS) in its 2010 listing decision (75 FR 13910) and shown in Table B-2 in the Monitoring Framework (Appendix B of the Lewistown Field Office Proposed Resource Management Plan Amendment/Final Environmental Impact Statement). Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR) 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e. residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see Glossary Terms).

The BLM, via the Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy that will inform the National Environmental Policy Act (NEPA) decision making process including the application of the mitigation hierarchy for BLM management actions and

third party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to GRSG habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to GRSG and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following sections provide additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

DEVELOPING A REGIONAL MITIGATION STRATEGY

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any State-level GRSG mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in Chapter 2 of the Lewistown Field Office Proposed Resource Management Plan Amendment/Final Environmental Impact Statement, the BLM will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of GRSG, within 90 days of the issuance of the Record of Decision (ROD). The Strategy will be developed within one year of the issuance of the ROD.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

Avoidance

- Include avoidance areas (e.g. right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or land use plans (e.g. Resource Management Plans, State Plans); and
- Include any potential, additional avoidance actions (e.g. additional avoidance best management practices [BMPs]) with regard to GRSG conservation.

Minimization

- Include minimization actions (e.g. required design features [RDFs], BMPs) already included in laws, regulations, policies, land use plans, and/or land-use authorizations; and
- Include any potential, additional minimization actions (e.g. additional minimization BMPs) with regard to GRSG conservation.

Compensation

- Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.
  - Residual Impact and Compensatory Mitigation Project Valuation Guidance
    - A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.
    - This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project.
    - For compensatory mitigation projects, consideration of durability (see Glossary Terms), timeliness (see Glossary Terms), and the potential for failure (e.g. uncertainty associated with effectiveness) may require an upward adjustment of the valuation.
    - The resultant compensatory mitigation project will, after application of the above guidance, result in proactive conservation measures for GRSG (consistent with BLM Manual 6840 – Special Status Species Management, section .02).
  - Compensatory Mitigation Options
    - Options for implementing compensatory mitigation should be identified, such as:
      - Utilizing certified mitigation/conservation bank or credit exchanges.
      - Contributing to an existing mitigation/conservation fund.
      - Authorized-user conducted mitigation projects.
    - For any compensatory mitigation project, the investment must be additional (i.e. additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).

- Compensatory Mitigation Siting
  - Sites should be in areas that have the potential to yield a net conservation gain to the GRSG, regardless of land ownership.
  - Sites should be durable (see Glossary Terms).
  - Sites identified by existing plans and strategies (e.g. fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to GRSG and are durable.
- Compensatory Mitigation Project Types and Costs
  - Project types should be identified that help reduce threats to GRSG (e.g. protection, conservation, and restoration projects).
  - Each project type should have a goal and measurable objectives.
  - Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.
  - To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA Management Zone, should be identified.
- Compensatory Mitigation Compliance and Monitoring
  - Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.
  - Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.
- Compensatory Mitigation Reporting
  - Standardized, transparent, scalable, and scientifically-defensible reporting requirements should be identified for mitigation projects.
  - Reports should be compiled, summarized, and reviewed in the WAFWA Management Zone in order to determine if GRSG conservation has been achieved and/or to support adaptive management recommendations.

- Compensatory Mitigation Program Implementation Guidelines
  - Guidelines for implementing the State-level compensatory mitigation program should include holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

INCORPORATING THE REGIONAL MITIGATION STRATEGY INTO SUBSEQUENT IMPLEMENTATION LEVEL LAND USE AUTHORIZATION ANALYSES

The BLM will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM management actions and third party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

IMPLEMENTING A COMPENSATORY MITIGATION PROGRAM

The BLM need to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State-level (as opposed to a WAFWA Management Zone or a Field Office), in collaboration with our partners (e.g. Federal, Tribal, and State agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the ROD. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM will remain responsible for making decisions that affect Federal lands.

GLOSSARY TERMS

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (adopted and modified from BLM Manual Section 1794).

Avoidance mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g., may also include avoiding the impact by moving the proposed action to a different time or location.)

Compensatory mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g. chemical vegetation treatments, land acquisitions, conservation easements). (adopted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur. (adopted and modified from BLM Manual Section 1794).

Durability (protective and ecological): The maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (adopted and modified from BLM Manual Section 1794).

Minimization mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Residual impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

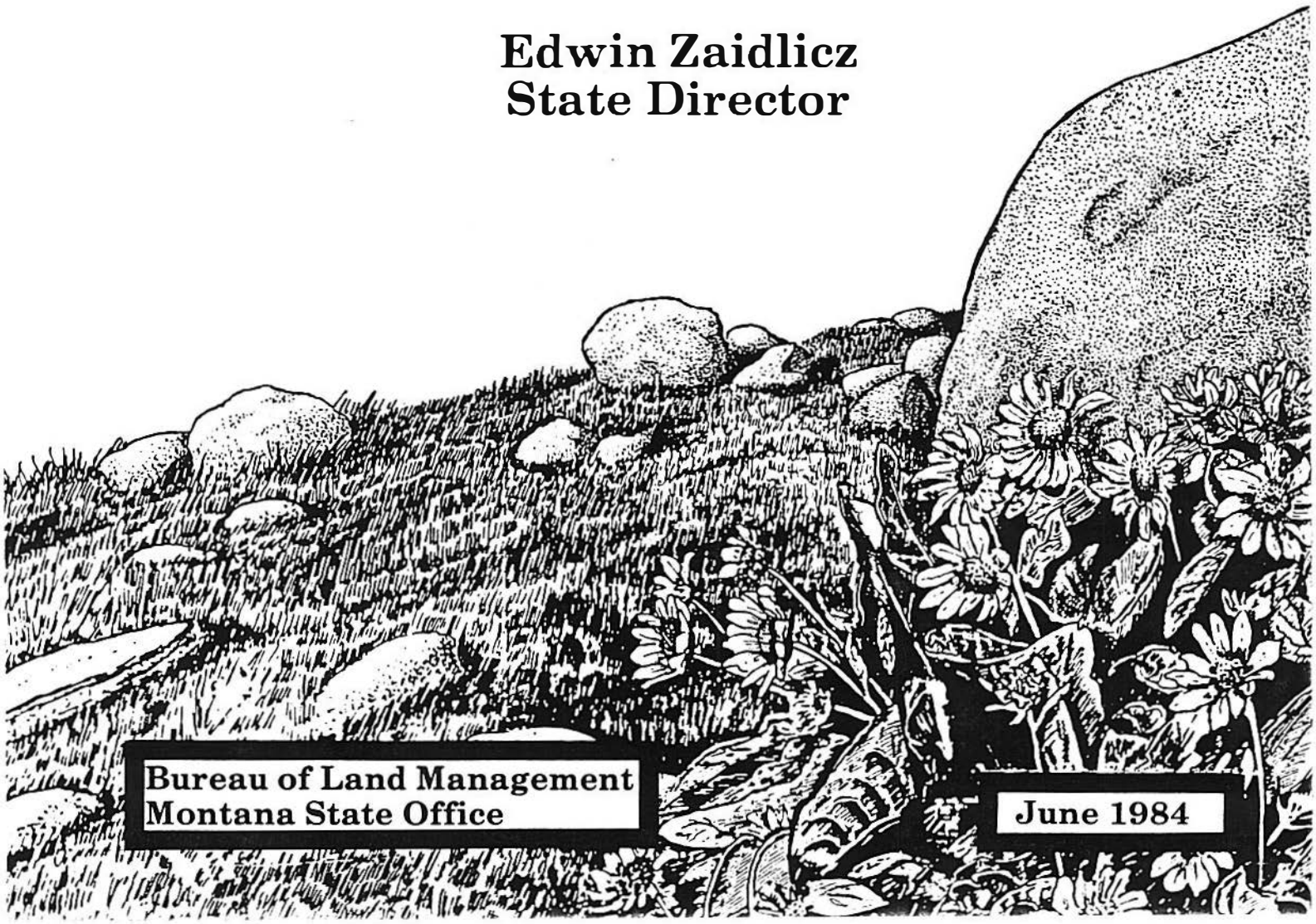
Appendix H

Land Pattern Review and Land Adjustment

LAND PATTERN REVIEW AND LAND ADJUSTMENT

Supplement to State Director Guidance for Resource Management Planning in Montana and the Dakotas

Edwin Zaidlicz
State Director



Bureau of Land Management
Montana State Office

June 1984

BLM-MT-PT-84-015-4111

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
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1601 (930)

June 8, 1984

Dear Reader:

This supplement to the "State Director Guidance for Resource Management Planning in Montana and the Dakotas" encorporates changes and corrections resulting from the public review of the March 1984 draft. The document updates and replaces the Land Adjustment portion of the April 1983 State Director Guidance.

The portions of the 1983 document replaced are as follows: on page B-1 beginning with the "Land Pattern Review and Adjustments" paragraph continuing to "Corridor Planning" on the middle of page B-6. Appendix 1 is deleted because this information has been revised and incorporated into the Supplement. The Recreation Program Guidance (pages H-1 through H-3) is replaced with minor revisions.

I appreciate the effort and concern of all who submitted comments on the draft. All comments were carefully considered and many of the suggestions have been incorporated.

Response to Comments Not Incorporated

Some comments urged greater emphasis on wildlife values in the planning for land adjustment, and to eliminate reference to economics, agricultural and community expansion interests. We believe the criteria as developed provide a balanced treatment of all resources and public interests. This is an objective we strive for as a multiple use agency, within the constraints established by the law and national policy.

Questions were raised regarding definition of several terms such as public interest and public values. These are general terms which we believe should not be rigidly defined in a broad scope guidance document. They take on specific meaning as land adjustments are considered and processed. At each step relevant laws, regulations, national policies and public involvement guide the Bureau in defining what decisions are in the public interest or which may reflect the highest public interest.

In response to a question raised about the program specific acquisition criteria, no priority is implied by the order of their listing.

Concern was expressed over the Bureau's evaluation of the resources involved in exchanges or other land adjustments. The information and

rationale for BLM land adjustments are always open to public scrutiny, and opportunity for formal comment or protest occurs at key points in the process (i.e., during land use planning and when a Notice of Realty Action is issued).

One commentor perceived differences between field offices in making land adjustment decisions. All such variation cannot be eliminated, but it is one of the purposes of this guidance to increase consistency across our three states. It also provides standards against which consistency can be measured.

More exchanges between the BLM and the US Forest Service were urged and we are open to these opportunities. We plan to act on these opportunities within priorities as they are established for the limited resources available for land adjustment.

In a similar vein we were urged to support three-way exchanges involving the state or other Federal agencies. Such actions are within the scope of the guidance as written. However, regardless of the agencies involved BLM will evaluate the lands to be disposed or acquired against the criteria in this document and the overall objective under the Federal Land Policy and Management Act that the bulk of the public lands be retained and managed for multiple use and sustained yield.

Finally, one commentor urged that an Environmental Impact Statement (EIS) be prepared on the Guidance Supplement. An EIS was not prepared for the following reasons: The document is guidance for preparation of land use plans and subsequent program management. A land use plan (Resource Management Plan) includes an EIS and a plan amendment requires an Environmental Assessment (EA) or possibly an EIS. Every specific land adjustment proposal requires its own EA and technical report on the land involved. Environmental impacts will be thoroughly examined, and, most appropriately, at the stages in case processing when the actions are tangible and meaningful analysis can be done.

Map Revisions

We have reprinted the South Dakota map because of several errors. There were minor errors on the Montana map and the North Dakota map which are addressed with the enclosed errata sheet.

Some commentors seemed concerned that the maps present final Bureau decisions. This is not the case; the maps are generalized graphic displays of long term goals and expectations for the Land Adjustment Program. As was explained in the document, exceptions will be made in both retention and non-retention zones as the adjustment process unfolds and more detailed information is acquired on specific land transactions.

It should not be assumed that lands outside a retention zone are automatically intended for disposal. For example, concern was expressed over some small BLM tracts at Big Lake in Yellowstone County. These lands are involved in a cooperative wildlife project and will be retained. The overriding issue is not the zone in which a tract of land is displayed but whether it meets criteria for retention or disposal. The zones provide insight into Bureau emphasis and the most probable type of adjustment action, but are not meant to be tract specific in most cases.

One comment requested widening the retention zone along the Yellowstone River between Glendive and Sidney. We believe that expanding this corridor might raise the issue of conflict with important agricultural development in this area. We intend to retain and acquire lands in this corridor which have wildlife and recreation values but which are not primarily valuable for agricultural use. We do not intend to pursue acquisitions in conflict with productive agriculture.

Finally, two larger retention areas were inadvertently omitted from the Montana map. These involve BLM lands on the upper Stillwater River in Stillwater County and land along the lower Missouri River extending to the North Dakota border. These areas are defined in more detail on the errata sheet and will be added to the map when next revised.

Sincerely yours,

Ed Zaidlicz

Ed Zaidlicz
State Director

2 Enclosures
Encl. 1 - Guidance Supplement
Encl. 2 - South Dakota Map

ERRATA

Land Pattern Adjustment Maps

Montana Map

Roosevelt County — Within T. 27 N., R. 59 E., an area of approximately 2,500 federally-owned acres should be mapped as a retention zone. Other lands north of the Missouri River which possess river access will also be considered for retention. The retention zone south of the Missouri in Richland County should also be extended eastward to the North Dakota state line. This includes the area in Townships 26 N. and 27 N.

Stillwater County — BLM administered land in the upper Stillwater drainage should be mapped as a retention zone. These lands are in Bad Canyon and south of Beehive. In total about 2,500 acres are involved and lie primarily in Township 4 S., R. 16 E.

North Dakota Map

Burleigh—Morton Counties — A zone along the Missouri should be mapped for retention from the upper end of Oahe Reservoir northward approximately six miles.

McKenzie County — The retention zone on the lower Yellowstone is incorrectly placed on the east side of the river. This retention zone should include both sides of the Yellowstone and extended to its confluence with the Missouri.

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STATE DIRECTOR GUIDANCE
LAND BASE ADJUSTMENT SUPPLEMENT

This supplement replaces the "Land Pattern Review and Land Adjustments" Section of the 1983 State Director Guidance beginning on page B-1 through midpage B-6 and including Appendix 1. In addition, pages H-1 through H-3 of the Recreation Program Guidance are revised and included with the Supplement.

INTRODUCTION

A new era in public land management began with the enactment of the Federal Land Policy and Management Act (FLPMA) in 1976. Prior to FLPMA public land management policy emphasized custodial management pending disposal. FLPMA prescribed retention of the public lands, but also authorizes BLM to enter into land adjustments.

The 8.4 million acre public land pattern in Montana and the Dakotas is characteristically fragmented, and typically consists of lands left over after the most desirable areas were placed in private ownership. Some 2.5 million acres exist in a scattered pattern of relatively small tracts from 40 to 160 acres in size.

Additional large but fragmented areas of split mineral estate occur, particularly in eastern Montana and the Dakotas. Some of these areas are underlain by minable coal deposits and/or have oil and gas development potential. The remaining public lands occur in relatively large tracts but it is usually only coincidental when the BLM lands are in a pattern conducive to ease of management or optimum utilization of the resources.

Major types of land adjustment concerning the BLM in Montana and the Dakotas are:

State Exchange
Regular Private Exchange
Multi-party Exchanges
State Selection
Mineral Exchanges
Acquisition
BLM/Forest Service Jurisdictional Transfers
Withdrawals
Community Expansion
Public Sale

No particular priority is implied by this list other than state land adjustments will take precedence over private proposals.

The State Director Guidance issued in April 1983 included criteria for planning decisions involving exchanges, jurisdictional transfers, or land sales. This supplement integrates existing plans and categorizes lands to provide a framework for future planning. Using this framework and the 1983 State Director Guidance we have completed maps showing areas where public lands will generally be retained. Until such time as land use plans are amended or revised, these maps will serve as a guide for all land adjustments.

The land retention maps are presented as a general policy guide to aid the public and agency personnel in evaluating proposals for land transactions. They should be helpful in distinguishing between proposals worthy of more detailed evaluation and those which are not. These maps and the accompanying analysis provide an indication of the probable long term magnitude of land adjustment in Montana and the Dakotas. This guidance supplement also provides an opportunity to revise and clarify the criteria published in 1983 and for public review and comment on these revisions.

Tract-specific land adjustments must be based upon land use plan decisions followed by more detailed activity planning. Land exchanges will be based upon the voluntary offering by the owners of the land which BLM may acquire, and will involve exchange of appraised value for value. This does not mean that the same kind of values must be exchanged. Relative abundance of the resources involved and their place in agency and public priorities must be considered.

SCOPE OF THE PROGRAM

Of the 8.4 million acres administered by BLM in Montana and the Dakotas, 7.3 million acres (87 percent) are classified within retention zones. Approximately 1.1 million acres (13 percent) lie outside these retention zones, and it is estimated that over the expected life of the program (7 to 10 years) roughly half of this acreage may be involved in some type of land adjustment.

A stable level of land adjustment actions over the life of the program is our objective, however, some year-to-year variation will occur. Long-term accomplishments will depend upon public response in offering suitable lands in exchange for BLM disposal tracts as well as the availability of budgets to carry through the necessary planning and implementation action. Other factors which may limit the level of adjustment actions include the presence of mining claims, sensitive resource values such as archeological sites, unique fish, wildlife and recreational values, and economic limitations on the capacity of some adjacent landowners to participate.

Land adjustment would be predominately through exchanges. A small acreage may be disposed of under the Recreation and Public Purposes Act and some acreage may be involved in boundary adjustments with the U.S. Forest Service. Based on experience to date, sales will be a very minor part of the total land transactions. Although exchange will predominate there could be some reduction in total federal ownership because many transactions will require that the BLM acreage be greater than the acreage acquired to equalize values.

Goals and Objectives

The overall goal of the land adjustment program is a public land pattern which balances multiple resource values while at the same time brings about better manageability. No individual land adjustment will achieve all resource objectives listed in this document, but the cumulative effect of land adjustments should result in improved multiple use management. These adjustments will achieve better overall public usability, greater management efficiency, and optimum accomplishments for all resource interests.

The Bureau's adjustment decisions should be made after thorough analysis and study of land use potential and should achieve the following long term objectives:

1. Retain those public lands having significant public values; acquire (primarily by exchange) other lands which will contribute significantly to accomplishing public land management objectives.
2. Adjust the BLM land pattern to get the highest public value.
3. Land use planning and public review and participation will occur as required by FLPMA, NEPA, and other related legislation.
4. Identify and transfer those public lands which could attain a higher and better use in the private sector or if managed by another public agency.

MAP BASIS AND INTERPRETATION

Public Review

The land retention maps in this supplement were prepared using criteria published in the 1983 State Director Guidance. This guidance, and in particular the land review and adjustment criteria, received extensive inter-governmental and public review. In accordance with the majority of the comments received, the land adjustment program will emphasize exchanges.

Planning

The land review criteria were applied in four recently completed land use plans. These are the Billings and Headwaters Resource Management Plans (RMPs) in Montana and the Southwest and McKenzie-Williams Management Framework Plans (MFPs) in North Dakota. RMPs are in progress in the Powder River, Garnet and South Dakota Resource Areas.

The maps in this supplement incorporate decisions made in the recently completed plans. In areas where plans are under way, the retention zones are preliminary and may be adjusted when the land use plans are completed. In other areas retention zones were developed by District interdisciplinary teams applying the adjustment criteria and using existing planning documents and inventory.

Map Interpretation

As stated earlier, the maps of public land retention zones are presented as a policy guide, not as a rigid prescription. Future land use plans may revise the boundaries currently drawn. Activity plans done on individual tracts may reveal lands within the retention zone appropriate for disposal and many tracts outside the retention zones essential to retain or acquire.

Retention Zones

The retention zones define areas where BLM intends primarily to retain or enhance the existing public land holdings. Public lands in most of these zones amount to sizeable acreages, most are in reasonably consolidated holdings or contain resource values appropriate for public ownership.

Individual tracts in retention zones may be exchanged when significant management efficiency or a greater public values would be acquired. Under some circumstances a tract may be sold to serve an important public purpose. Public land acreage within these zones is not anticipated to decline but may increase because land acquisition in exchanges will be concentrated in these zones.

Other Lands

Public lands in this area are open to consideration on their individual merits for retention, exchange, transfer or sale. In general, the lands are in small tracts, widely scattered and often without legal or physical access. It is in this zone that the majority of disposal tracts will be found. Lands meeting the retention criteria (having significant public values) will be retained or exchanged for land with higher public values.

The preferred action regarding lands which fit the disposal criteria is to exchange them for lands within a retention zone. Recent examples include the acquisition of recreation and wildlife lands on Holter Lake near Helena and Howery Island on the Yellowstone River in exchange for a number of rangeland tracts in eastern Montana. Exchanges may also be considered which will acquire publicly desirable tracts outside the retention zones. A net reduction in BLM administered acreage outside the retention zones is expected.

LAND PATTERN REVIEW AND LAND ADJUSTMENT PROGRAM (EXCHANGES, JURISDICTION TRANSFERS, SALES)

Land Adjustment Program Phases

Phase I—State Director Guidance

Published in 1983 and containing criteria for categorizing public lands, State Director Guidance is revised with this supplement.

Phase II—Land Categorization

Retention areas are delineated through use of existing completed plans, ongoing planning and the State Director Guidance Supplement. The current delineation/categorization effort is summarized in this supplement and may be modified as a result of future land use planning.

Phase III—Land Activity Planning and Realty Implementation

Program priorities are developed followed by implementation which includes site specific land report-environmental analysis, appraisal, decisionmaking and land title processing.

Land Pattern Review and Adjustment Criteria

Three types of criteria are presented (retention, disposal, and acquisition) to provide guidance in categorizing the public lands and in making decisions concerning specific land pattern adjustment actions.

The criteria range from specific to general and give direction for statewide consistency while allowing the manager flexibility in responding to local circumstances.

The criteria will be applied on an interdisciplinary basis. This requires consideration of all resource values, but since all values are not normally represented on every tract of land, trade-offs between resource values will usually be necessary when making decisions on specific land adjustment actions. Such trade-offs will be based on a hierarchy of values defined as follows:

1. Requirements of applicable laws, executive orders and regulations will be followed.
2. Priority will be determined by the area directly impacted and the significance of the resources in descending order of national, regional, statewide, and local. Both economic and non-economic values will be considered in assessing resource significance.
3. A critical level of significance will be assigned to resource values if they are adversely impacted over an area larger than the specific tract being considered for land adjustment action.
4. Public value losses which cannot be mitigated will be assigned a higher level of significance than those which can be mitigated.
5. A higher level of significance will be assigned to public values which are associated with solving chronic management problems which past efforts have failed to resolve and for which no other solutions are evident.

Retention

These are lands which will remain in public ownership and be managed by BLM. BLM is interested in exchanges to improve manageability of areas with important public values. Although the underlying philosophy is long term public ownership, minor adjustments involving sales and exchanges of lands may occur when the public interest is better served.

1. Areas of national environmental significance: These include but are not limited to:
   a. Wilderness, Wilderness Study Areas and Former WSAs being Studied for Protective Management
   b. Wild & Scenic Rivers
   c. National Scenic & Historic Trails and Study Trails
   d. Lands containing nationally significant cultural resource sites nominated to or eligible for the National Register of Historic Places
   e. National Conservation areas
   f. Wetlands and Riparian Areas under Executive Order 11990
   g. Other Congressionally Designated Areas and Study Areas
   h. Wild Horse Management Areas
   i. Areas of Critical Environmental Concern

2. Areas of national economic significance: these include but are not limted to:
   a. Designated Mineral Resource Areas where disposal of the surface would unnecessarily interfere with the logical development of the mineral estate, e.g., surface minerals, coal, phosphate, known geologic structures, etc.
   b. Public lands containing strategic minerals needed for national defense.
3. Public lands used in support of national defense: these include but are not limited to National Guard maneuver areas.
4. Areas where management is cost-effective or lands containing other important characteristics and public values which can best be managed in public ownership by BLM will be retained. These include but are not limited to:
   a. strategic tracts along rivers, streams, lakes, ponds, springs, and trails
   b. community watersheds and/or flood plains
   c. wildlife priority areas as defined under acquisition criteria for wildlife habitat areas
   d. Important hunting or fishing areas
   e. Recreation sites and areas
   f. Cultural resource sites where the cost of mitigation actions required by disposal would exceed the public benefits of land disposal.
5. Lands with a combination of multiple use values which dictate they should be retained in public ownership and managed by BLM.
6. Areas where future plans will lead to further consolidation and improvement of land patterns and management efficiency.
7. Areas which the general public, state and local government consider suitable for permanent public ownership.
8. Public lands withdrawn by the BLM or another federal agency for which the purpose of the withdrawal remains valid and the resource uses can be managed concurrently by BLM.
9. Public lands that contribute significantly to the stability of the local economy by virture of federal ownership.
10. Public lands which provide public access and contain previously mentioned public values which, when considered together, warrant their retention.

Guidelines for the retention of the mineral estate are fairly well described and are mandated under FLPMA. These require that the mineral estate will be reserved by the U.S. in all land disposals except in some cases where exchanges are involved. In exchanges, the mineral estate may be reserved by both parties presuming no material interference with development of the mineral resource due to disposal of the surface estate. If values are equal, title may pass with the surface estate.

Disposal

These are lands identified for potential removal from BLM administration through exchange, through transfer to federal, state, county or local public entities or through sale. In addition to land internally identified for disposal, BLM will respond to proposals from the public. Disposal decisions will be made in the public interest based upon the following criteria:

1. Lands specifically identified through land use plans for exchange, transfer, Recreation and Public Purposes Act applications or sale.
2. Lands of limited public value.
3. Widely scattered parcels which are difficult for BLM to manage with anything beyond minimal custodial administration and have no significant public values.
4. Lands with high public values proper for management by other federal agencies, or state or local government.
5. Lands which will serve important public objectives (such as community expansion) as provided in FLPMA Sec. 203(a)(3).
6. Lands where disposal would aid in aggregating or repositioning other public lands or public land resource values in retention areas to facilitate national, state and local objectives.

7. Lands acquired for a specific federal purpose which are no longer required for that or any other federal purpose.
8. Lands with long term unauthorized use problems, if the lands are not required for public purposes.
9. Lands in which the highest public value will be attained through long term agricultural, commercial or industrial development.

Acquisition Criteria

These are used to evaluate proposals which would result in the acquisition of lands, easements or minerals by the Bureau of Land Management through exchange or other transactions.

These criteria help to assure that any BLM decision to acquire a tract of land provides significant public benefits. The criteria range from "general" standards to evaluate all proposals, to "specific" guidelines covering the selected or prioritized program areas.

These standards are designed to provide consistent direction, while allowing management flexibility to meet local, state and national needs.

General Criteria for Acquisition (and Retention Decisions)

All proposals will be evaluated to determine if the acquired lands will:

1. Facilitate access to areas retained for long term public use.
2. Enhance Congressionally designated areas, rivers or trails.
3. Be primarily focused in the "retention" areas. Acquisition outside the retention areas will only be considered if the action leads to and/or facilitates long term needs or program objectives.
4. Facilitate national, state and local BLM priorities or mission statement needs.
5. Place emphasis where BLM land use or activity plans are completed. Proposals must facilitate implementation and/or be consistent with these plans.
6. Stabilize or enhance local economies or values.
7. Meet long term public land management goals as opposed to short term.
8. Be of sufficient size to improve use of adjoining public lands or, if isolated, large enough to allow the identified potential public land use.
9. Allow more diverse use, more intensive use, or a change in uses to better fulfill the Bureau's mission.
10. Enhance the opportunity for new or emerging public land uses or values.
11. Contribute to a wide spectrum of uses or large number of public land users.
12. Facilitate management practices, uses, scale of operations or degrees of management intensity that are viable under economic program efficiency standards.
13. Secure for the public significant water related land interests. These interests will include lake shore, river front, stream, pond or spring sites.

Program Specific Acquisition Criteria

Any of these program criteria may provide the rationale for acquiring a particular tract of land in land adjustment transaction; however, priority will be determined on the basis of multiple use analysis. That is, the greater the number of programs and public values served, the higher the priority for acquisition.

Minerals

1. Consolidation of [redacted] mineral estates—from the minerals program viewpoint this is probably the most important reason for acquisition. The primary purpose for consolidation of estates is improvement of potential for development while improving resource management and economic values.

   This concept can be applied to some deposits of coal, phosphate, potash, oil shale and tar sands. It is difficult to envision that this approach would be useful for oil and gas or locatable minerals.

2. Acquisition in response to a federal project need, as in the case of a dam project. Criteria for this type of acquisition would generally include:
   a. Where development of the federal project would preclude the mineral estate owner from exercising development rights; or
   b. Where the exercise of the mineral estate owners right of development would materially interfere with the federal project.
3. Acquisition mandated by law. The best example of this would be where an alluvial valley floor has precluded coal mining, triggering an exchange.

Livestock Management

Acquire non-federal holdings in key allotments which will enhance manageability and investment opportunity in improvement and maintenance category allotments.

Timber Management

Focus acquisition priority on areas:

1. Which exceed 30 cu. ft/acre in growth of commercial timber unless the areas will enhance the harvest of adjacent lands. In this case, the standard may be lowered to 20 cu. ft/acre in annual growth.
2. Contiguous to, or which facilitate access to public forest land.
3. Containing 80 acres or more of commercial timber. If less than 80 acres, the tract(s) must be logical logging unit(s) or facilitate commercial management of adjacent public forest land.
4. Containing enough harvestable volume for a feasible commercial logging unit after physical, biological or other land use constraints are considered.

Recreation

Acquire lands with the following significant public values:

1. National Values
   a. Congressionally designated areas/rivers/trails
   b. Congressionally designated study areas/rivers/trails
2. State Values
   a. Select lands that enhance state recreation trails and waterways (see State Comprehensive Outdoor Recreation Plan; SCORP Vol. 2, 1978, p. 149) or those with interstate, state, and multi-county use significance
   b. Other statewide and multi-county values
3. Local values for extensive use, such as hunting, fishing, ORV and snowmobile use. Higher priority will be given to acquisition of these values where such extensive use will compliment and enhance these uses on public lands.
4. Acquire access through easement to the above significant values as needed to facilitate public use if surface acquisition is undesirable or not possible.

Wilderness

Acquire in-holdings within the boundaries of Congressionally designated wilderness areas under BLM administration. Priorities are:

1. State in-holdings to be acquired through exchange only
2. Private in-holdings to be acquired by mutual agreement involving exchange, purchase, or gift

In the acquisition of access to designated wilderness areas highest priority will be:

1. Where no access exists
2. Where it is needed for proper management as identified in wilderness management plans

Cultural Resources

Any cultural site to be acquired should meet the following evaluation standards of MSO Manual Supplement 8111.24:

1. High Research Value
2. Moderate Scarcity
3. Possess some other unique values such as association with an important historic person or high aesthetic values, or
4. Contribute significantly to interpretive potential of cultural resources already in public ownership.

Strong consideration should be given to manageability. There are only a limited number of potential uses to which a cultural resource can be put (see IM 78-339). The principal use is probably research. Any site acquired for this purpose should be protectable and accessible. The second most important use may be some form of visitor or recreation use. Acquired sites in this case should be in areas also important to the Recreation Program unless they can stand on their own.

The major deciding factor for site acquisition after applying the basic criteria should be the potential for actively managing the site. Sites should not be acquired on scattered or isolated parcels unless they are of overwhelming cultural importance.

Wildlife Habitat Management

In general, areas with important wildlife habitat which are large enough and suitable for public hunting, fishing and trapping and areas suitable for cooperative management under the Sikes Act.

High priority areas for retention and acquisition will be lands with significant wildlife values as defined below. These areas may be of any size.

1. *Threatened and Endangered Species* (approved recovery plans will also govern actions on these areas)
   a. *Black-footed Ferret.* Occupied habitat or areas identified through planning for future ferret populations.
   b. *Grizzly Bear.* Lands containing grizzly population centers (Management Situation 1 and 2 Lands*).
   c. *Whooping Crane.* Suitable or potential habitat.
   d. *Bald Eagle.* Historical nest sites with remaining potential, present nest sites, or documented roosting or wintering areas.
   e. *Grey Wolf.* Occupied habitat.
   f. *Peregrine Falcon.* Verified nest areas and suitable sites for reestablishment.
2. *Fisheries.*** Access to or larger areas adjacent to Class 1, 2 or 3 streams** and lake and pond fisheries. Stream areas with restoration potential to become Class 1, 2 or 3 streams. Sites to develop additional fisheries especially near population centers. Sites supporting spawning or nursery areas which may be temporal in nature but important to downstream fisheries. Land that would enable us to acquire needed instream flow reservations.
3. *Big Game.* Important habitat areas such as crucial winter and associated spring/fall transition areas, kidding/fawning/calving/lambing areas, crucial wallow complexes, mineral licks, and security areas.
4. *Upland Game Birds, Migratory Birds and Waterfowl.* Crucial breeding, nesting, resting, roosting, feeding and wintering habitat areas or complexes. These will vary in size, for example, a highly productive one acre wetland or 100 acres of nesting cover for pheasants.
5. *Raptors.* Existing and potential nesting areas for sensitive species or significant nesting complexes for nonsensitive species.
6. *Nongame.* Crucial habitat complexes.

*From Guidelines for Management Involving Grizzly Bears in Yellowstone Area, USFS, NPS 1979.

**Class of streams defined by Montana Department of Fish, Wildlife and Parks, 1980. Stream Evaluation Map State of Montana.

MAP ANALYSIS

Table I summarizes the acreage identified for retention by district and by state. Montana districts range from 91 percent retention in Lewistown to 85 percent in Miles City. The state average is 88 percent. Retention percentages in North and South Dakota are 65 and 68 percent respectively, but because of smaller total acreages in those states, the three-state average is 87 percent.

TABLE I
POTENTIAL LAND ADJUSTMENT SUMMARY
BLM ACREAGE (X 1000)

	In Retention Zones	Percent of Total	Other Lands Outside Retention Zone	Percent Total	Total
Montana*	7,122	88%	987	12%	8,109
South Dakota	177	68%	85	32%	262
North Dakota	44	65%	24	35%	68
Three State	7,343	87%	1,096	13%	8,439
*Break-down of Montana by District Office:					
Butte DO	1,259	88%	175	12%	1,434
Lewistown DO	3,119	91%	315	9%	3,434
Miles City DO[1]	2,744	85%	497	15%	3,241
Montana Total	7,122		987		8,109

[1]Miles City DO total does not include South Dakota Resource Area.

Retention Zones

These zones predominantly contain public lands that meet the retention criteria.

All BLM lands in nationally designated areas will be retained: including the Upper Missouri National Wild and Scenic River, all wilderness study areas, Lewis and Clark National Historic Trail, Pryor Mountain Wild Horse Range, Square Butte Outstanding Natural Area and all designated National Register Historical and Cultural Sites.

Other Lands

These lands generally are scattered tracts that are difficult to manage due to their small size, very limited legal access, and distance from the office administering them. In many cases, the resource values of these lands are low.

Although these lands are open to consideration for all types of land adjustment actions, many parcels of land where significant resource values are found will be retained under BLM management. Also, some parcels may be encumbered in a variety of ways that require public retention. Examples are withdrawals, recreation and public purpose leases, or mining claims. The Dillon Resource Area has several strips of land withdrawn for stock driveways that lie in the open zone. Land within a municipal watershed would be retained. Also, tracts would be retained to be consistent with state and local land use plans or other agency's policies. Enhancement of national historic trails such as the Continental Divide Trail may require that isolated tracts be retained.

The Montana Map

The BLM ownership information on this map was taken from a base prepared several years ago and is no longer completely accurate; however, the retention zone boundaries were developed using current larger scale work maps.

In Montana the retention zones encompass large, generally compact areas of public land which provide for the most efficient management and the fewest access problems. Smaller units were delineated where resource values are high. This includes areas along rivers or where the lands reflect public priorities such as wilderness study areas. In eastern Montana some areas of rather limited surface ownership are classified for retention because of a significant Federal mineral estate.

The zones, as delineated, are generally consistent with existing plans and plans in progress. However, in the Dillon Resource Area (southwest Montana) the land use plan completed in 1979 did not identify zones, but instead identified specific tracts for acquisition and disposal. A programmatic environmental assessment was completed for these disposal tracts in October 1983. The adjustment zones as defined in this document are not entirely consistent with the terms of the Dillon MFP, in that considerations of any additional land sale proposals not covered in the programmatic environmental assessment in 1983 would require plan amendments.

A substantial block of BLM-adminstered land in the Big Snowy Mountains adjacent to the Lewis and Clark National Forest is not included in a retention zone. This apparent inconsistency results from a decision in the Billings Resource Management Plan to transfer this land to the U.S. Forest Service at some future date.

South Dakota Map

The South Dakota Resource Area, under the Miles City District, covers the entire state. The lands administered by BLM in South Dakota total approximately 262,000 acres. A single map showing the BLM lands in South Dakota was not available, therefore, the retention zones were delineated from large scale working maps. The BLM ownership within the retention zones was then drafted using current information. BLM ownership outside the retention zone is not shown.

A total of 177,000 acres or 68 percent of the BLM lands in South Dakota are contained in the retention zones. These are in four relatively compact clusters in the northwest quarter of the State. These zones were defined to correspond to the larger concentrations of public lands. A number of the tracts contained in the eastern-most zone along the Oahe Reservoir also reflect high recreation values.

A total of 85,000 acres or 32 percent of the lands administered by BLM in this resource area lie outside the retention zones. These are scattered tracts mostly in the western part of the state and intermingled with state lands, other federal lands and tribal lands.

North Dakota Map

The Dickinson District contains all of the BLM administered lands in North Dakota, a total of approximately 68,000 acres. Most BLM lands are in the western half of the state and there are only two areas of significant concentration. These lie along the Little Missouri River in Dunn County and western Bowman County in the southwest corner of the state. As in South Dakota, a single current map of BLM administration in North Dakota was not available. Retention zones were identified from larger scale maps and within those zones the current land holdings are shown.

The retention zones contain approximately 44,400 acres or 65 percent of the total surface acreage BLM administers in North Dakota. About 40,600 acres of the BLM lands within these zones are in two counties, Dunn and Bowman; and there are minor acreages in Williams, McHenry, Divide, Burleigh and McLean counties, totalling 3,800 acres.

Generally, lands within the retention zone will be retained in federal ownership or exchanged for other lands within these zones. These lands may also serve as core areas for acquiring adjacent lands in exchange for BLM lands categorized for disposal outside the retention zones.

There are many valuable resources on BLM lands in Bowman and Dunn Counties, and a variety of uses occur, including grazing, dispersed recreation, hunting, fishing, and oil and gas development. Lands located within the retention zones in other counties may also contain many resources or may be wetlands or riparian lands with more limited uses, such as providing wildlife habitat, recreation or water storage.

The area outside the retention zones contains approximately 23,600 acres or 35 percent of the BLM surface in North Dakota. Of this, 6,000 acres are located in Bowman County, and the remaining 17,600 are scattered among 31 counties across the State. Generally, the tracts of land within this zone

RECREATION PROGRAM GUIDANCE REVISIONS

are available for disposal, except for wetlands, which have public value for water retention and wildlife habitats. Lands that fall within this area are available for disposal through exchange or transfer to another public agency or through sale. Preference will be given to exchanging lands in this area for lands within the retention zone.

It is also recognized that limited acquisition outside the retention zones may be justified on the basis of one or more of the acquisition criteria listed in this document.

The primary objectives of adjusting BLM land pattern are to: improve management efficiency; make the public lands in North Dakota more accessible and usable by the general public; and, in general, enhance recreation opportunities and natural resource protection in the State.

LAND ADJUSTMENT IMPACTS

About 1.1 million acres of BLM administered land is found outside the designated retention areas. Less than half of this acreage may actually be affected by land adjustments because of a variety of constraints. If a detailed examination of any tract finds values that fulfill the retention criteria it will normally be retained. Opportunities for publicly beneficial exchanges or transfers may not be found for many tracts of otherwise disposable land.

Resource Impacts

Effects on the Bureau's resource programs are expected to be significantly positive. Under terms of the land adjustment criteria the lands important to BLM resource management programs will be retained. Lands of lesser value will generally be exchanged for lands which will make a greater contribution to public resource management objectives.

Some adverse effects may occur to lands which pass out of Bureau control because the Bureau cannot guarantee the future stewardship of the new owner. However, it is BLM policy to avoid disposal actions where the intended future use is harmful to the resource base or to community interests. Generally the lands coming into federal ownership and control will be important for public use.

Management and Access

By consolidating its land holdings the BLM can increase its management efficiency through economics of scale. This could be the result of working with fewer livestock operators, decreased travel costs to manage isolated tracts and decreased paperwork associated with casefiles and other management problems.

Consolidation would facilitate such management projects as land, watershed or vegetative treatments or wildlife habitat programs. Transfers of some public land tracts could make management more efficient and produce more public benefits under management of another agency or organization.

Access to public lands should be enhanced by the BLM acquiring key tracts or easements that would assure the public legal access to blocks of public lands. Improved access will generally increase recreational use in areas where a checkerboard ownership pattern now restricts public use.

Social and Economic Effects

The BLM is required by law to establish through standard appraisal procedure the fair market value of lands to be exchanged or sold.

In some cases a private landowner who adjoins a piece of public land and wishes to add it to his agricultural operation may feel that such a valuation greatly exceeds the return that can reasonably be expected from the agricultural use of the land. This can result because the appraisal considers comparable sales on the open market and the potential highest and best use in economic terms, such as rural subdivision.

Therefore, they fear loss of agricultural use of the public land to individuals who will pay fair market value because they intend to convert the land to another use such as homesites.

Similarly, the holder of a grazing lease on a tract identified by BLM for disposal will be offered the opportunity to acquire it through exchange or purchase. The ability of the lessee to participate can vary widely and there is a potential for adverse impacts to some operations through loss of the leased area or through additional financial burdens resulting from its acquisition.

County governments will experience some effect on Payments in Lieu of Taxes (PILT) and payments from grazing and mineral receipts if public lands in their counties are exchanged for lands in another county. When public lands are transferred to private ownership the tax base in the affected county will thereby be increased and the PILT and other payments decreased.

The net fiscal effects on local governments depend upon the type of land adjustment. They depend upon whether the land adjustments are with private landowners, state governments, local governments or other federal agencies. They would also depend upon whether exchanges are largely within or between counties and how the tax return on lands passing into private ownership compares with the level of PILT payments and grazing and mineral fees returned for these lands. Tax exempt lands acquired from state or local governments through exchanges would be excluded from PILT.

Public attitudes regarding specific land adjustments may also vary widely depending upon the type of land transfer, the reasons for the transfer and individual perceptions of who may gain or lose from the transfer.

RECREATION

The Bureau has demonstrated a limited capability to obtain funds to sustain any kind of consistent recreation development programs.

However, we should take advantage of existing situations and capabilities to provide for future public needs. We are in a better position, in terms of skills and land pattern, than any other Federal agency to acquire recreation opportunities through purchase or exchanges. We have the capability to use the scattered tracts of public land as a trading base to acquire areas or easements for access. This is particularly true in locations where there is no single Federal reserve and where there are limited public use areas, whether State or Federal. Through acquisition the public will be provided use of such areas (described below) or they can be held for future public management options.

The RMP should identify access needs to recreation resources of national or state value. We would then be in a position to acquire such values when opportunities for purchase or exchange present themselves. Parameters of such a program are listed below, but generally, the objective is to provide both legal and physical access to strategic locations. For example, for river floating the strategic location could be—one access point per four hours of float or at highway crossings; for historic battlefields—one prominent viewpoint; or for National trails—one access point per 10-15 miles or at State highway crossing. Location and number of access points will depend on the significance of the value and the anticipated demand. Both of these should be determined through the planning system with public involvement.

New, fully developed destination type areas will not be provided by the Bureau in the tri-state area, unless there is a significant issue identified that suggests Bureau development. Generally, this type of facility will be recognized as being provided by other Federal or the State agencies.

The following are the parameters of the suggested recreation program. These are outside parameters and a general (not absolute) hierarchy from most important to lowest priority.

Opportunities beyond those listed can be identified and discussed in the RMPs, but should be looked on as recreation resources to manage on a custodial basis until some other agency, group or individual can be found to take over management. Such management can be by lease, cooperative agreement, or transfers.

Kinds of Ownership Actions We Will Take

1. Retention of public use areas and access routes (trail or motorized) to public lands involving the opportunities described below.
2. Acquisition of strategically located lands for public use of recreation opportunities described below. These can be through exchange, purchase, contributions or easements.
3. Acquisition of access to opportunities or strategically located lands for public use of recreation opportunities described below.

Generally, we will not assist other Federal agencies in blocking up or eliminating in-holdings for recreation purposes unless public support and interest is generated during the planning effort.

Kinds of Opportunities on Which We Will Concentrate Our Efforts

1. Existing nationally recognized resources (Congressionally designated):
   - A. Upper Missouri Wild and Scenic River
   - B. Lewis and Clark National Historic Trail
     - (1) Upper Missouri Wild and Scenic River segment
     - (2) Yellowstone River segment
     - (3) Upper Missouri River area
     - (4) Lower Missouri River segment
     - (5) Land based trail, Three Forks to Park City
     - (6) Marias River area
     - (7) Blackfoot River
   - C. Continental Divide National Scenic Trail
   - D. National Wilderness areas under BLM management
   - E. National Conservation, Natural Historic or other special type areas (Pryor Mtn. Wild Horse Range).

2. Potential national values (designated by Congress for study):
   A. Nez Perce Trail
   B. Yellowstone River
   C. North Country Trail
3. Statewide recognized values defined in the Statewide Comprehensive Outdoor Recreation Plan (SCORP) as a Federal role or identified for cooperative management.
   A. Recreation trails, waterways or rivers/streams with free flowing value (see SCORP Vol.2, 1978, p. 149).
   B. Other recognized recreation sites/areas, cultural, natural or scenic values under BLM management: Garnet, Fort Meade, and Square Butte.
4. Local recreation areas (see FLPMA, Sec. 206a) for extensive use such as hunting, fishing, and snowmobile use.

Kinds and Levels of Development We Will Consider

1. Limited development/ uncontrolled use. Development will be limited to identification through signs and maps of public use areas and access routes. Heavy reliance will be put on map handouts.
2. Primitive facilities where use exceeds natural carrying capacity. Development probably limited to parking, privy, and water access ramp on sites 10 acres or less.
3. Access development: Low standard (e.g., foot trails, ORV trails, or primitive roads).
4. Low level development site with camp unit, loop road, privies, water and other support facilities as necessary. Development will not exceed 20 units on sites of 50 acres or less.

Off-Road Vehicle Designations

Formal designations will be made for areas where problems have been identified. Plans are to identify areas in which ORV use is restricted or closed. All other areas will be considered open and receive formal designation only when considered necessary by the District Manager.

Each activity specialist shall have the responsibility for considering ORV designation needs to protect his own particular resource values by using the following minimum set of planning criteria:

1. Damage caused by ORV use to soils, watershed and vegetation shall be minimized.
2. Harassment of wildlife or significant disruption of habitat shall be minimized.
3. Conflicts between ORV use and other existing or proposed uses for the same or neighboring public or private lands shall be minimized; e.g., wilderness.

Appendix I
Drought Policy

APPENDIX I
DROUGHT POLICY

Bureau of Land Management
POLICY FOR ADMINISTERING PUBLIC LAND GRAZING
IN
MONTANA, NORTH AND SOUTH DAKOTA
DURING PERIODS OF DROUGHT

I.1 INTRODUCTION

Livestock grazing is but one of the activities that BLM manages on the public lands. Drought stresses many resources and resource uses including recreation, soils, timber, vegetation, watersheds, and wildlife as well as livestock forage. However, only livestock and human activities can be readily controlled or restricted from access to public lands. The other resources are either immobile or not readily controlled. This policy deals with livestock use and implements provisions of current laws and regulations. Other uses that may require special consideration during severe drought may be addressed in separate policy statements or actions.

Vegetation cover is one part of productive rangelands because it strongly affects soil moisture. When drought reduces the total forage produced and the normal residual vegetation (standing and down plant material) is used by livestock, insects, and other grazing animals, soil moisture and temperature are affected. Soil temperatures are lowered by the residual cover during warm periods and are raised by the residual cover during cold periods. Moisture intake and penetration into soils is keyed to the amount and type of residual cover found on a soil/ecological site. In fact, with little or no residual cover on rangelands, moisture events will likely produce little effective penetration into the soil. Residual cover provides protection for soils, vegetation, wildlife, watersheds, and for the many other resources dependent upon good vegetation and livestock management.

I.2 AUTHORITY

This document implements provisions of:

- Taylor Grazing Act of June 28, 1934, as amended;
- Federal Land Policy and Management Act of 1976, as amended;
- Public Rangelands Improvement Act of 1978;
- Regulations in 43 code of Federal Regulations, Group 4100(43 CFR 4100).

I.3 POLICY

This policy is meant to supplement the national drought policy as set forth by Washington Office Instruction Memorandum 2013-094.

It is the policy and objective of the BLM to: manage the public lands and authorize livestock grazing under the principles of multiple use and sustained yield; provide for the orderly administration of grazing by domestic livestock on the public lands; and provide for productive and healthy soil and vegetation resources as well as other environmental values.

Accomplishment of these objectives becomes more difficult during periods of range depletion caused by drought. Normal grazing schedules and livestock management practices may have to be modified. Additional coordination, consultation, and data exchange between livestock operators and Bureau personnel will be required, over and above the level normally practiced. Appropriate local, state and Federal agencies and the interested public will have to be involved at times and consistently kept informed.

The principal thrust of the policy and procedures in this document, and other regulatory and procedural requirements not repeated here, will be for the livestock operator and BLM to jointly develop strategies for livestock use on public land during and following drought. Strategies selected should be those that best protect rangeland resources while minimizing impacts on the operator to the extent possible. To that end, every degree of flexibility provided by the laws and implementing regulations will be available to authorized officers of the Bureau.

Voluntary adjustments in livestock use of public lands should be sought at the earliest date it becomes apparent that "normal" grazing schedules cannot be followed, or, if followed, would result in long-term resource degradation. The earlier an agreement can be reached or a decision made that "normal" grazing schedules cannot be followed, the more opportunities livestock operators will have to consider alternatives to minimize impacts on his or her operation. Waiting until the last minute before scheduled turnout to make a determination or decision will reduce the options available to both the operator and the Bureau.

An interdisciplinary approach (within the confines of scarce skills availability) to identify natural resources and other applicable public values vulnerable to drought will be used to prioritize allotments for attention. Second, efforts to manage public rangeland under drought conditions will be directed next to allotments with resource concerns—typically "I" category allotments. Specific allotments in the "M" and "C" categories can also be considered high priority when resource values or conditions so require. Regardless of the category assigned to an allotment, operators should be aware of the procedures and flexibilities available for dealing with drought conditions.

BLM fully expects that the vast majority of livestock operators will recognize the need and voluntarily make adjustments in livestock use of public lands the longer a drought persists. These adjustments will be recognized during the application process and grazing bills will be adjusted accordingly. Adjustments in grazing use may include but are not limited to reducing livestock numbers, shortening the season of use, altering pasture move dates, changing pasture rotations, authorizing water hauling (after documenting NEPA compliance), closing allotments to grazing use, or allowing use in vacant allotments.

- Regulatory mechanisms to voluntarily implement grazing use changes include approval of applications for voluntary non-use (43 CFR 4130.2(g)), or approving applications for changes within the terms and conditions of permits and leases (43 CFR 4130.4(b)), or some combination.
- Line officers also have the option to implement needed changes through a formal agreement between the BLM and grazing operator (which is recommended to be implemented by decision) that specifies the drought-related grazing adjustments (43 CFR 4110.3-3(a)), or by temporarily suspending or otherwise modifying use via a decision that may be put into immediate effect, if necessary (43 CFR 4110.3-2(a) and 3-3(b)).[2]
- If using an agreement or decision, indicate within it the intended duration of the drought-related adjustments and include supporting rationale for the indicated timeframe.
- Regulation 43 CFR 4130.6-2 provides the mechanism for the BLM to authorize use in vacant allotments. Do not modify permits and leases (43 CFR 4130.3-3) to make drought responsive short-term grazing use adjustments.

Offices are required to screen any proposed drought mitigation strategies and actions to determine if they trigger the requirement for National Environmental Policy Act (NEPA) compliance documentation and if so, whether existing documentation is adequate or whether additional analysis is needed. Addressing drought management in Resource Management Plans or Allotment Management

Plans, or preparing programmatic drought action plans, provides pro-active opportunities to address potential conditions and contingencies.

In those situations where agreement cannot be reached, authorized officers of the Bureau have the final responsibility and accountability for ensuring that public lands are not permanently damaged by improper use. If issuance of a decision concerning livestock use becomes necessary, the procedure specified in 43 CFR 4160 will be followed. It should be further understood that final decisions can be modified or rescinded, if the conditions that existed when the decision was issued no longer exist. If significant amounts of precipitation occur during the growing season, producing significant changes in the amount of moisture available to plants, this may cause decisions to be reconsidered. The consultation, cooperation, and coordination process will be used to obtain livestock operator and stakeholder involvement in such cases.

I.4 PROCEDURES AND GUIDELINES

The following guidelines and procedures are intended to provide the data, flexibility and direction for public land managers and livestock operators to develop strategies and make decisions during drought conditions. Consultation and coordination with livestock operators and other interested parties will be carried out during all procedural steps.

I.4.1 Winter Assessment (Late-October - February)

Analysis

1. Review the past season's monitoring results. Analyze plant growth, actual use, insect infestation occurrences, utilization, use pattern maps, residual cover, and especially the use of "rest" pastures. Review the past season's land health assessments in areas of concern.
2. Analyze precipitation records and distribution patterns from the National Weather Service, the Montana Drought and Water Information website, the North Dakota Drought website, the South Dakota Drought website, local cooperators, BLM, and other agencies. Tabulate moisture departures from normal levels and timing of precipitation in relation to past years' growing season.
3. Determine whether currently available data is sufficient to inform and support drought responsive actions.
4. In identified priority or "I" allotments where there is concern because there is limited residual cover, effective precipitation well below normal, rest pastures already used, abnormally high utilization or use patterns, etc., field offices may opt to measure soil moisture in representative areas for additional data. Where available, use RAWS/OMNI sites, existing soil moisture stations, NRCS SCAN soil climate monitoring sites, etc. Additional soil moisture samples

are to be taken at the rooting depth of major forage species in representative areas using techniques found in agency manuals/handbooks, the professional literature and extension publications.

Action

1. Where it is apparent resource degradation might occur if drought continues, begin to notify operators through letters and news releases that the coming year's livestock grazing could be affected.
2. Set up range user meetings in affected communities to discuss available information and possible actions to prevent range resource damage.
3. Encourage operators to make needed changes in their grazing schedules, including applying for non-use. If non-use is taken, but activated later should conditions change, BLM will waive the $10 service fee in accordance with 43 CFR 4130.8.3. Authorized officers may issue refund or credit of grazing fees under 43 CFR 4130.8-2(b).
4. Meet with individual operators when available information indicates a particular allotment is affected by severe drought condition. Attempt to reach agreement on alternative grazing strategies if conditions do not change.

I.4.2 Late Winter and Spring Assessment (February - April)

Analysis

1. Review precipitation and soil moisture data for winter and early spring.
2. Review the effects of winter grazing use; snow pack influence for stock water, soil temperatures, etc-
3. Continue soil moisture measurements or monitoring where problems are apparent or in areas of concern. Measurements at rooting depth to measure available water for plants will be especially important during this period.
4. Assess availability of livestock water, in consultation with permittees.
5. Assess the availability of water for wildlife.

Action

1. If drought conditions are continuing, or becoming more severe, follow up winter letters and news releases with updates and attachments to grazing applications. Conduct meetings with Cooperative State Grazing Districts and Resource Advisory

Councils. Meetings are encouraged with other concerned individuals and agencies as a part of the grazing management strategy.

2. Contact remaining operators who have not voluntarily made needed changes. Where you believe you have enough information to indicate an allotment is in severe drought condition, meet with the operator to review and explain the information you have and attempt to reach agreement on a grazing strategy. If an agreement cannot be reached and, especially if the allotment has a relatively early turnout date, issue a proposed decision. The extent of use adjustment contained in this decision (delayed turnout, reduction in numbers or duration, total exclusion, etc.) will depend on your assessment of all the factors involved. These include past grazing use, range condition, residual cover, precipitation, soil moisture and the land use objectives for the allotment.

3. If soil moisture is very dry and tending to blow away (Quick Assessment), or below the average soil moisture between field capacity and wilting point (Volumetric Measurement), delay turnout until key forage plants have grown to the 3-4 leaf stage (approximately one-half their normal height--for most of our native grass species about 6 inches). (Manske 2003, Manske 2011, Fraser 2003)

I.4.3 Continuing Assessment (throughout grazing season)

Analysis

1. Continue to closely monitor precipitation in "I" allotments and areas of concern. Attention is directed to determining effective (soil moisture) growing season precipitation.

2. Closely monitor utilization of key plant species and key areas. Remember to consider management objectives when selecting key species and areas.

3. Continue to monitor soil moisture in "I" allotments and areas of concern.

4. Monitor factors other than livestock grazing, such as insect infestations, congregations of wildlife, availability of livestock water, etc.

5. Monitor forage, habitat and water needs for wildlife. Consult with state wildlife agencies as needed.

Action

1. If soil moisture drops below the average soil moisture between field capacity and wilting point (Volumetric Measurement) and utilization has reached objective levels or a maximum of 30 percent utilization has occurred, livestock are to be removed.

2. If soil moisture remains unacceptable (completely dry and blows away (Quick Assessment)) or below wilting point soil moisture levels (Volumetric Measurement) during most of the spring and early summer with little or no growth in primary forage species for livestock (i.e., range readiness has not been reached), advise affected permittees that fall and winter ranges may not be available for use during the current year. Also advise that production in subsequent years may be affected if plant basal areas and density have been severely reduced.
3. For those permittees in "I", allotments with AMPs having available standing forage in rest pastures or fall or winter use pastures, advise the permittees that livestock must be removed from public lands when consumption of standing forage has reached objective levels or a maximum of 50 percent.
4. Adjust monitoring plans to collect data concerning residual cover, plant death, loss of basal area, density, and yield for analysis and use in later years.
5. Utilize interdisciplinary teams to ensure wildlife forage and water requirements are considered when determining adjustments.

I.4.4 Other Considerations

1. The use of salt, mineral, and certain mineral supplements as necessary to overcome natural shortages of minerals in rangeland forage may be authorized as necessary to provide for proper range management(4130.3-2(c)).
2. Maintenance feeding on public lands is not authorized except under very unusual short-term conditions and by permit only. Maintenance feeding during drought conditions is specifically excluded.
3. Applications for a maintenance feeding permit due to poor forage conditions associated with drought should be denied and livestock removed or not allowed.
4. Review RMP guidance on wildlife habitat objectives.

I.4.5 Definitions

Available water: That portion of water in a soil that plants can extract from the soil—generally measured per unit volume of soil; the amount of water in a soil between field capacity and permanent wilting point.

Basal area (range): The area of ground surface covered by the stem or stems of a range plant, usually measured 1 inch above the soil in contrast to the full spread of the foliage.

Density: (1) The number of individual plants per unit area; (2) Refers to the relative closeness of plants to one another.

Field Capacity: The maximum amount of water held in a soil, measured a few days after it has been thoroughly soaked and allowed to drain freely.

Flexibility: The ability to alter the grazing management plan to meet changing conditions.

Flushing: Feeding female animals a concentrated feed shortly before and during the breeding period for the purpose of stimulating ovulation.

Growing season: In temperate climates, that portion of the year when temperature and moisture are usually most favorable for plant growth.

Key species: (1) Forage species whose use serves as our indicator to the use of associated species; (2) Those species which must, because of their importance, be considered in the management program.

Maintenance feeding: Supplying feed to range animals when available forage is too limited to meet their minimum daily requirement (examples are cubes, pellets, baled or loose hay).

Permanent Wilting Point (PWP): The soil water content at which water is no longer available to plants, causing them to wilt because they cannot extract enough water to meet their requirements.

Phenology: The study of periodic biological phenomenon such as flowering, seeding, etc., especially as related to climate.

Range readiness: The defined stage of plant growth at which grazing may begin under a specific management plan without causing permanent damage to vegetation or soil.

Supplemental feed: A feed which supplements the forage available from the public lands and is provided to improve livestock nutrition and good animal husbandry and rangeland management practices. An example is salt or mineral block. Creep feeders to supplement feed for calves and supplemental feeding to "flush" cattle and sheep for breeding may be authorized on public lands when compatible with the resource management objectives.

1.4.6 Soil Moisture Monitoring Methods Appendix

Quick Assessment

Soil moisture readings taken from 3 rooting depths of key forage species (e.g., 4-6 inches, 10-12 inches, 16 inches up to 3 feet) will indicate whether various key forage species have adequate moisture for growth. Squeeze the soil in your

hand. Does it form a ball? If so, you probably have adequate soil moisture for growth. If it doesn't form a ball, but your hand feels cool, you probably have some soil moisture left. If the soil is completely dry and blows away, there is likely not enough moisture to sustain plant growth. (Howery 1999).

% Available water remaining	Coarse (Sand - Loamy Sand)	Light (Sandy Loam)	Medium (Loam, Silt Loam, Silty Clay Loam, Clay Loam, Sandy Clay Loam)	Heavy (Sandy Clay, Silty Clay, Clay)
0 (PWP or drier)	Dry, loose, single grained, flows through fingers	Dry, loose, flows through fingers	Powdery, dry, sometimes slightly crusted but easily breaks down into powdery condition	Hard, baked, cracked, sometimes has loose crumbs on surface
< 50	Still appears to be dry; will not form a ball with pressure	Still appears to be dry; will not form a ball	Somewhat crumbly but will hold together from pressure	Somewhat pliable, will ball under pressure
50-75	Still appears to be dry; will not form a ball with pressure	Tends to ball under pressure but seldom will hold together	Forms a ball, somewhat plastic, will sometimes slick slightly with pressure	Forms a ball, will ribbon out between thumb and forefinger

(Table adapted from Manitoba 2013)

Volumetric Measurement

The soil moisture content may be expressed by weight as the ratio of the mass of water present to the dry weight of the soil sample, or by volume as ratio of volume of water to the total volume of the soil sample. To determine any of these ratios for a particular soil sample, the water mass must be determined by drying the soil to constant weight and measuring the soil sample mass after and before drying. The water mass (or weight) is the difference between the weights of the wet and oven dry samples. The criterion for a dry soil sample is the soil sample that has been dried to constant weight in an oven at temperature between 100 – 110°C (105°C is typical). Normally drying is conducted on samples for at least 24 hours. A precision balance scale is needed (±0.001 g.) Volumetric soil moisture can then be determined.

$$\text{Gravimetric soil moisture (W\%)} = \frac{\text{wt. (wet soil)} - \text{wt. (oven dry soil)}}{\text{wt. (oven dry soil)}} \times 100\%$$

Volumetric soil moisture (θ%) = gravimetric soil moisture x bulk density

{Note: Bulk densities for specific soils can be obtained from the Web Soil Survey.}

Soil moisture measurements can then be compared with water content-15 bar and water content 1/3 bar data for a specific soil from the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/). Water content, 15 bar, is the amount of soil water retained at a tension of 15 bars, expressed as a volumetric

percentage of the whole soil material. Water retained at 15 bars is significant in the determination of soil water-retention difference, which is used as the initial estimation of available water capacity for some soils. Water retained at 15 bars is an estimation of the wilting point. Water content, one-third bar, is the amount of soil water retained at a tension of 1/3 bar, expressed as a volumetric percentage of the whole soil. Water retained at 1/3 bar is significant in the determination of soil water-retention difference, which is used as the initial estimation of available water capacity for some soils. Water retained at 1/3 bar is the value commonly used to estimate the content of water at field capacity for most soils.

As soil moisture levels approach the wilting point of a soil, the less water available for plants. Plant growth becomes marginal and the plant is stressed. If the plant is further stressed by removal or damage to the top growth, it will begin to lose vigor, roots and thus its ability to grow. It is not unusual to reach this moisture level during late summer in much of Montana, Dakotas, and other semi-arid areas.

Other Soil Moisture Considerations

When monitoring soil moisture the following information should be kept in mind:

1. Soil moisture is measured at the depth of plant roots or to a root limiting layer. It will vary by plant(s) and soil type.
2. Soluble salts, gravel and heavy clay will decrease plant available water capacity.
3. Organic matter, good soil structure will increase plant available water capacity (The capacity increases about 1 percent for each 1 percent of organic matter).
4. Soils with water restricting layers like naturally compact subsoil, shallow bedrock or stratification can increase plant available water capacity of the overlying soil layers.
5. Soils that are deep, medium textured and uniform can have decreased plant available water but allow for deeper rooting.

1.4.7 References

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Appendix J

Oil and Gas Lease Stipulations

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
5001 Southgate Drive
Billings, Montana 59101-4669

OIL AND GAS LEASE STIPULATIONS

ESTHETICS--To maintain esthetic values, all surface-disturbing activities, semi-permanent and permanent facilities may require special design including location, painting and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of the Federal Surface Managing Agency (SMA).

EROSION CONTROL--Surface-disturbing activities may be prohibited during muddy and/or wet soil periods.

CONTROLLED OR LIMITED SURFACE USE STIPULATION --This stipulation may be modified, consistent with land use documents, when specifically approved in writing by the Bureau of Land Management (BLM) with concurrence of the SMA. Distances and/or time periods may be made less restrictive depending on the actual on-ground conditions. The prospective lessee should contact the SMA for more specific locations and information regarding the restrictive nature of this stipulation.

The lessee/operator is given notice that the lands within this lease may include special areas and that such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled, or **if absolutely necessary**, excluded. Use or occupancy will be restricted only when the BLM and/or the SMA demonstrates the restriction necessary for the protection of such special areas and existing or planned uses. Appropriate modifications to imposed restrictions will be made for the maintenance and operations of producing oil and gas wells.

After the SMA has been advised of specific proposed surface use or occupancy on the leased lands, and on request of the lessee/operator, the Agency will furnish further data on any special areas which may include:

100 feet from the edge of the rights-of-way from highways, designated county roads and appropriate federally-owned or controlled roads and recreation trails.

500 feet, or when necessary, within the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams: 1,000 feet, or when necessary, within the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies.

500 feet from grouse strutting grounds. Special care to avoid nesting areas associated with strutting grounds will be necessary during the period from March 1, to June 30. One-fourth mile from identified essential habitat of state and federal sensitive species. Crucial wildlife winter ranges during the period from December 1 to May 15, and in elk calving areas during the period from May 1 to June 30.

300 feet from occupied buildings, developed recreational areas, undeveloped recreational areas receiving concentrated public use and sites eligible for or designated as National Register sites.

Seasonal road closures, roads for special uses, specified roads during heavy traffic periods and on areas having restrictive off-road vehicle designations.

On slopes over 30 percent or 20 percent on extremely erodible or slumping soils.

See Notice on Back

NOTICE

APPLICATIONS FOR PERMIT TO DRILL (APDs)--The appropriate BLM field offices are responsible for the receipt, processing, and approval of APDs. The APDs are to be submitted by oil and gas operators pursuant to the requirements found in Onshore Oil and Gas Order No. 1 -- Approval of Operations on Onshore Federal and Indian Oil and Gas Leases (Circular No. 2538). Additional requirements for the conduct of oil and gas operations can be found in the Code of Federal Regulations Title 43, Part 3160. Copies of Onshore Oil and Gas Order No. 1, and pertinent regulations, can be obtained from the BLM field offices in which the operations are proposed. Early coordination with these offices on proposals is encouraged.

CULTURAL AND PALEONTOLOGICAL RESOURCES--The SMA is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the SMA, shall:

1. Contact the appropriate SMA to determine if a site-specific cultural resource inventory is required. If an inventory is required, then:

2. Engage the services of a cultural resource specialist acceptable to the SMA to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the area of proposed disturbance to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

3. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as testing salvage and recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited.

The operator shall immediately bring to the attention of the SMA any cultural or paleontological resources discovered as a result of approved operations under this lease, and not disturb such discoveries until directed to proceed by the SMA.

ENDANGERED OR THREATENED SPECIES--The SMA is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species, listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1973 by detrimentally affecting endangered or threatened species or their habitats.

The lessee/operator may, unless notified by the authorized officer of the SMA that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resources specialist approved by the SMA. An acceptable report must be provided to the SMA identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.

Standard 16-3
Lewistown Field Office
North Dakota Field Office
Malta Field Office
Havre Field Office
Glasgow Field Office

Appendix K

GRSG Wildfire and Invasive Species Habitat Assessment

APPENDIX K
GRSG WILDFIRE AND INVASIVE SPECIES HABITAT ASSESSMENT

The following process is a suggestion for a consistent approach in conducting an assessment of the GRSG habitat and wildfire threat at the local planning area level. Variations to this approach may be made based on interdisciplinary team discussion or unique issues in a given planning area. This example format is intended to portray the degree of specificity required for offices which will complete these assessments. Note that this process has similarities to watershed analysis and ecoregional assessments, and as such these documents may prove useful where they exist.

INTRODUCTION

Greater Sage-Grouse (GRSG) Wildfire and Invasive Species Habitat Assessments (hereafter referred to as "stepdown assessments") are interdisciplinary evaluations of the threats posed by wildfire and invasive species, as well as identification of priority areas/treatment opportunities for fuels management, fire management, and restoration. Priority areas are spatial delineations where treatments, management actions, or other emphasis should be placed due to factors such as habitat quality, threats, or opportunities to protect, enhance, and restore GRSG habitat. The stepdown assessments will serve as a bridge between Resource Management Plans (RMP) and project level planning, and will position planning efforts to conduct project-scale National Environmental Policy Act analysis following RMP Records of Decision.

The stepdown assessment process involves four steps, beginning with characterization of the planning area and concluding with spatial delineation of priority areas. The content and methods used by the US Bureau of Land Management (BLM) in these documents should be consistent to ensure that priority areas are defined using similar criteria. These criteria and methods should be narratively described such that the US Fish and Wildlife Service (USFWS) and other audiences can understand the factors considered.

STEP 1: CHARACTERIZATION OF GREATER SAGE-GROUSE HABITAT

The purpose of this step is to broadly establish context of the planning area and GRSG habitat.

Location and Spatial Extent

- Describe the location of the planning area, and the relationship of GRSG habitat within the planning area.

Relationship to the Larger Scale Setting

- How does the planning area lie within the larger context of GRSG habitat?

Quantifying Habitat within Planning Area

- Brief description of GRSG habitat described in terms of acreage, habitat classes (e.g., Priority Habitat Management Area (PHMA), General Habitat Management Area (GHMA), and/or Priority Areas for Conservation [PAC]).
- Note: A summary map showing the planning area with habitat features is appropriate in Step 1. A tabular summary may also be included.

STEP 2: ISSUES AND KEY MANAGEMENT QUESTIONS

The purpose of this step is to devise management questions related to the issues of fuels management, fire management, and restoration. Note that this step should not answer each management question. Rather, management questions are answered in Step 4 through specific, quantified data.

Overview

- In coordination with state wildlife agencies, the USFWS, and your interdisciplinary team, develop an introductory section here which describes why fire or vegetation conditions pose a threat to GRSG in the local planning area. Describe where fire or vegetation conditions are a significant threat to GRSG habitat, and where fire, fuels, and restoration activities may help enhance habitat. In a brief paragraph or two, summarize the relationships between wildland fire, fuels management and invasives/restoration in the planning area. Examples would include annual grass/wildfire cycle, juniper encroachment into GRSG habitat, recently disturbed areas, etc.

Key Management Questions

Issue #1: Fuels Management

- In narrative format, develop management questions such as:
    1. Based on fire risk to important GRSG habitats, what types of fuels treatments should be implemented that will reduce the risk? Where should fuels treatments be prioritized, and

what's the amount of treatment acres/miles needed for long-term enhancement and protection of GRSG habitat?

2. Based on opportunities for fire to improve/restore GRSG habitats, what types of fuels treatments should be implemented that will increase ability to allow fire? Where should fuels treatments be prioritized, and what amount of treatment is needed for long-term enhancement and protection of GRSG habitat?
3. What fuel reduction techniques will be most effective; including, but not limited to grazing, prescribed fire, chemical, biological and mechanical treatments?
4. What are the criteria for defining priority fuels management areas (example would be the intersection of high burn probability, PHMA, lek locations, and established GRSG population)?
5. Are there opportunities to utilize a coordinated approach across jurisdictional boundaries?
6. Are there areas where fuel treatments help restore GRSG habitat as well as reduce risk?

Issue #2: Fire Management

- In narrative format, develop management questions such as:

1. Where is the greatest wildfire risk, considering trends in fire occurrence, fuel conditions, and highly valued GRSG habitat?
2. Where will fire suppression resources be most successful to mitigate the risk and protect GRSG habitats?
3. Where do opportunities exist that could enhance or improve suppression capability in important GRSG habitats?
    a. For example, increased water availability through installation of heli wells or water storage tanks.
    b. Decreased response time through pre-positioned resources or staffing remote stations.
4. Where should wildfire be managed to achieve RMP objectives for improving or restoring GRSG habitat (limiting juniper expansion)?
5. What are the criteria for defining priority fire management areas? An example would be the intersection of PHMA, lek locations, and high burn probability.

6. How can fire management be coordinated across jurisdictional boundaries to reduce risk or to improve GRSG habitat?

Issue #3: Restoration

- In narrative format, develop management questions such as:

1. Are there opportunities for restoration treatments to protect, enhance or maintain GRSG habitat? Assume that funding is not a constraint, and describe which sites are biologically suitable for restoration to GRSG habitat in a reasonable period.
2. Considering the entire planning area, what are the site conditions, such as dominant vegetation, elevation, or precipitation zones, where restoration efforts have been proven to be most successful in the recent past? An example would be mountain sagebrush sites over 5,000' in elevation, and in a 16" or greater precipitation zone.
3. What are the criteria for defining priority restoration areas? An example would be recent burns, moderately disturbed sites, or recovering allotment pastures which have not crossed ecological thresholds or become highly degraded. These may or may not be covered by existing emergency stabilization and restoration plans.
4. Are there opportunities to utilize a coordinated approach across jurisdictional boundaries?

STEP 3: CURRENT CONDITIONS AND TRENDS

The purpose of this step is to develop information relevant to the issues and key questions identified in Step 2. It provides a snapshot of the present condition, statement of causal factors, and a summary of the trends which are occurring.

Biological Summary of Vegetation, Invasive Species, and Fire Regimes

[In this introductory section, provide a general biological summary of the planning area. Provide a narrative description of ecological trends, including description of plant communities, fire regimes, and other dominant biological factors affecting GRSG habitat.]

- Describe how fire has influenced current vegetation patterns. Are there large areas of even-aged communities, fine-scale mosaics, and annual grass monocultures?
- Describe if fire regimes are intact, or if they are altered. If they are altered, describe why. Use fire regime variables such as fire frequency, severity, or size to elucidate your points.

- Describe dominant cover types making up the planning area. These can be broad seral stage groupings, general life forms, or more fine-scale information such as plant associations, habitat types, or ecological systems. Note: this information should be available in the RMP.
- What has been the impact of fire exclusion (e.g., increased conifer encroachment, decadent shrub communities, etc.)?
- What is the current extent of annual grasses and other invasive species?
- What are the effects of invasive species on land health? On trends in plant succession? On fire regimes?

Fuels Management

- Describe current fuels management practices within the planning area (what are the types of fuels treatments commonly applied to which management issues)?
- How has past fuels management influenced today's planning area (e.g., creation of mosaics, protecting certain features, increasing invasives, etc.)?
- What are causal factors which have created a need for fuels management practices?
- What are the trends in the fuels management program related to budget or capability?

Fire Management

- Describe the current fire suppression workload.
- Describe fire occurrence trends (include discussion of fire size, numbers of starts, ignition locations).
- Describe causal factors influencing suppression effectiveness.
- Describe suppression capabilities. Discuss types and numbers of resources within office, through interagency agreements, and through resource sharing.

Restoration

- Describe invasive species which are present in the planning area.
- Describe landscape conditions which may be suitable for restoration within the planning area, and the results of recent restoration efforts in the planning area.
- Describe invasive species occurrence.
- Describe causal factors influencing restoration needs.

Methodology

- What are the analysis methods to be utilized and analysis assumptions?

Use of Best Available Science

- Describe data sets used, such as the FSim layer, local data, etc. [Many data sets being used in RMPs will also be applicable to stepdown assessments].
- What are the elements of science used?

STEP 4: IDENTIFICATION OF TREATMENT OPPORTUNITIES, PRIORITY AREAS, AND ACTIONS

The purpose of this step is to utilize the information from steps 2 and 3 in order to quantify the overall need for treatment or other actions. Specifically, this step should spatially identify and quantify priority areas, using the criteria established in Step 2. Next, this step should identify treatment opportunities which fall within priority areas. Furthermore, treatments should be prioritized and an implementation schedule developed, reflecting the reality that not every acre in need of treatment can receive action within the planning horizon.

Fuels Management

- Spatially delineate priority areas for fuels management, based upon criteria established in Step 2. Fuels priority areas should be delineated by type, such as:
  - Linear fuel break along roads
  - Other linear fuel breaks to create anchor points
  - Prescribed burning
  - Mechanical (e.g., conifer removal)
  - Other mechanical, biological, or chemical treatment
- Quantify the number of acres of needed fuels treatments.
- If they exist, spatially delineate areas where fuel treatments would increase the ability to use fire to improve/enhance GRSG habitat.
  - Include tables, maps or appropriate information
- Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of fuels treatments.
- Quantify a projected level of treatment within fuels management priority areas.
- Identify treatments to be planned within fuels management priority areas.

- Include a priority or implementation schedule for proposed treatments.

Fire Management

- Spatially delineate priority areas for fire suppression, based upon criteria established in Step 2. Priority areas for fire management should be delineated by type, such as:
  - Initial attack priority areas
  - Resource pre-positioning and movement priority areas
  - Remote station staffing priority areas, if appropriate
  - Include tables, maps or other supporting information
- Quantify the number of acres of GRSG habitats for aggressive initial attack that were identified at highest risk from losing key habitat components.
- Quantify the number and type of suppression resources that will be staged or otherwise pre-positioned, as well as the associated conditions, in order to enhance initial attack capabilities.
- Spatially delineate areas where opportunities exist to enhance or improve suppression capability.
  - Include tables, maps or other supporting information
- Spatially delineate areas where wildfire can be managed to achieve RMP objectives.
  - Include tables, maps or appropriate information
- Quantify the number of acres within fire management priority areas
- Include a priority or implementation schedule for fire suppression proposed actions.

Restoration

- Spatially delineate priority areas for restoration, using criteria established in Step 2. Priority areas for restoration should be delineated by type, such as:
  - Seeding priority areas (aerial, drill, broadcast, or other)
  - Invasive species priority areas (herbicide, mechanical, biological, combination)
  - Priority areas requiring combinations of treatments (e.g., herbicide followed by seeding)
  - Include tables, maps or appropriate information
- Identify locations where post-fire restoration treatments should be focused.

  - Include tables, maps or appropriate information
- Spatially identify invasive species occurrence
- Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of restoration treatments.
- Quantify the projected level of treatment within restoration priority areas.
- Identify treatments to be planned within restoration priority areas.
- Include a priority or implementation schedule for proposed restoration treatments.

Annual Treatment Needs

1. Based on the information above and within the planning area, what are the annual needs based on the key questions and summary statements?

Annual Treatment Abilities

1. Putting GRSG habitat protection and enhancement into perspective with other high valued resources and important land management goals, how does the annual need relate to capabilities?
2. What are the realistic annual expectations in fire management, fuels management, and restoration for the next five years?

Appendix L

Special Status Species Confirmed or Likely to Inhabit the Planning Area

APPENDIX L
SPECIAL STATUS SPECIES CONFIRMED OR LIKELY TO INHABIT THE PLANNING AREA

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Mammals				
Black-tailed prairie dog	*Cynomys ludovicianus*	BLM S	Colonies are found on flat, open grasslands and shrub/grasslands with low, relatively sparse vegetation. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama, and big sagebrush. Colonies are associated with silty clay loams, sandy clay loams, and loams and fine to medium textured soils are preferred, presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Canada Lynx	*Lynx canadensis*	FT	Dense spruce-fir, Douglas fir, early seral lodgepole pine, mature lodgepole pine with developing understory of spruce-fir and aspen in subalpine zone and timberline, using caves, rock crevices, banks, logs for denning; closely associated with snowshoe hare.	Documented
Fringed myotis	*Myotis thysanodes*	BLM S	Rocky outcroppings in mid-elevation ponderosa pine, piñon/juniper, oak, and mixed conifer woodlands, grasslands, deserts, and shrublands.	Documented
Gray wolf	*Canis lupis*	BLM S	No particular habitat preference except for the presence of native ungulates within its territory on a year-round basis. Gray wolves establishing new packs in Montana have demonstrated greater tolerance of human presence and disturbance than previously thought characteristic of this species.	Documented
Northern myotis	*Myotis septentrionalis*	BLM S	Summer day roosts are cavities or crevices behind tree bark, often in partially dead hardwoods. Caves and abandoned mines are also utilized.	Documented
Spotted bat	*Euderma maculatum*	BLM S	Roosting occurs in small cracks or crevices found in cliffs and rock outcrops. Foraging occurs in a variety of habitats, particularly ponderosa pine forest and marshlands.	Documented
Swift fox	*Vulpes velox*	BLM S	Typically occupy open prairie and arid plains, including areas intermixed with winter wheat fields in north-central Montana. They use burrows when they are inactive; either dug by themselves or made by other mammals (marmot, prairie dog, badger). The burrows are usually located in sandy soil on high ground such as hill tops in open prairies, along fencerows, or occasionally in a plowed field. Suitable habitat generally extensive in size (preferably over 100,000 acres), with relatively level topography, and with greater than 50% of the area undisturbed by agriculture. A total of 8,000,000 suitable acres were identified in Montana.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Townsend's big-eared bat	*Plecotus townsendii*	BLM S	Associated with caves and abandoned mines for day roosts and hibernacula. Will also use abandoned buildings in western shrubland, piñon/juniper woodlands, and open montane forests in elevations up to 9,500 feet.	Documented
Birds				
American bittern	*Botaurus lentiginosus*	BLM S	Found in freshwater marshes and wetlands. Nesting occurs in the foundation of emergent vegetation in shallow water, often built on cattails, bulrushes, and sedges.	Documented
Baird's sparrow	*Ammodramus bairdii*	BLM S	Nest in native prairie, but structure may ultimately be more important than plant species composition. Nesting has been observed in crested wheat, while smooth brome is avoided. Areas with little to no grazing activity are required.	Documented
Bald eagle	*Haliaeetus leucocephalus*	BLM S	Found near open water including rivers, streams and lakes, nesting and roosting in large ponderosa pine, Douglas-fir, or cottonwood trees in proximity to open water and rivers.	Documented
Black tern	*Chilodonias niger*	BLM S	Wetlands, marshes, prairie potholes, and small ponds. 30%-50% of the wetland complex is emergent vegetation. Vegetation within known breeding colonies includes alkali bulrushes, canary reed-grass, cattail spp., sedge spp., rush spp., reed spp., grass spp., *Polygonum* spp., *Juncus* spp. and *Potamogeton* spp., indicating a wide variety of potential habitats are usable by Black Terns. Water levels range from about 0.5 meter to greater than 2.0 meter with most having depths between 0.5 meter and 1.0 meter.	Documented
Black-backed woodpecker	*Picoides arcticus*	BLM S	Found in boreal and montane coniferous forests, often in areas with burned trees. Nesting occurs in tree cavities.	Documented
Brewer's sparrow	*Spizella breweri*	BLM S	Sagebrush, mountain meadows, and mountain shrub habitats. Nested in sagebrush averaging 16-inches high. The cover (concealment) for the nest provided by sagebrush is very important.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Burrowing owl	*Athene cunicularia*	BLM S	Open grasslands, where abandoned burrows dug by mammals such as ground squirrels, prairie dogs, and badgers are available. Black-tailed prairie dog and Richardson's ground squirrel colonies provide the primary and secondary habitat for burrowing owls in the state.	Documented
Caspian tern	*Hydroprogne caspia*	BLM S	Breeds along water sources such as freshwater lake islands and river islands. Nesting may occur in shallow scrapes in bare sand or gravel, or rimmed depressions.	Documented
Chestnut-collared longspur	*Calcarius ornatus*	BLM S	Species prefers short-to-medium grasses that have been recently grazed or mowed. Prefers native pastures.	Documented
Common tern	*Sterna hirundo*	BLM S	Nests on islands, marshes, and beach lakes. Nest placement occurs on the ground.	Documented
Ferruginous hawk	*Buteo regalis*	BLM S	Mixed-grass prairie, shrub-grasslands, grasslands, grass-sagebrush complex, and sagebrush steppe.	Documented
Flammulated owl	*Psioscops flammeolus*	BLM S	Breeds in open pine forests, especially ponderosa pine stands. Nesting occurs in tree cavities.	Documented
Forster's tern	*Sterna forsteria*	BLM S	Breeds in marshes with abundant open water and large stands of vegetation. Nesting may occur in mud or sand, or floating vegetation.	Documented
Franklin's gull	*Larus pipixcan*	BLM S	Preferring large, relatively permanent prairie marsh complexes. Builds its nests over water on a supporting structure of emergent vegetation. Nesting is noted to occur in cattails and bulrushes.	Documented
Golden eagle	*Aquila chrysaetos*	BLM S	Nest on cliffs and in large trees (occasionally on power poles), and hunt over prairie and open woodlands. Cliff nests selected for south or east aspect, less than 200 inches snowfall, low elevation, availability of sagebrush/grassland hunting areas	Documented
Greater Sage-Grouse	*Centrocercus urophasianus*	BLM S/FC	Tall dense stands of sagebrush; 6 to 18 inch high sagebrush covered benches in June to July (average 213 acres); move to alfalfa fields (144 acres) or greasewood bottoms (91 acres) when forbs on the benches dry out; and move back to sagebrush (average 128 acres) in late August to early September.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Least tern	*Sternula antillarum*	FE	Nest on unvegetated sand-pebble beaches and islands of large reservoirs and rivers in northeastern and southeastern Montana, specifically the Yellowstone and Missouri river systems.	Documented
Loggerhead shrike	*Lanius ludovicianus*	BLM S	Open riparian areas, montane meadows, agricultural areas, grasslands, shrublands, and piñon/juniper woodlands.	Documented
Long-billed curlew	*Numenius americanus*	BLM S	Nests primarily in short-grass or mixed-prairie habitat with flat to rolling topography Habitats with trees, high density of shrubs (e.g., sagebrush [*Artemisia* spp.]), and tall, dense grass generally. Taller, denser grass used during brood-rearing when shade and camouflage from predators are presumably more important for chicks, but may also reflect decline in availability of shorter habitats with season.	Documented
McCown's longspur	*Calcarius mccownii*	BLM S	Breeding habitat is a matrix of perennial shortgrass species (e.g., *Bouteloua gracilis*, *Buchloe dactyloides*) interspersed with cactus, and limited cover of midgrasses (e.g., *Aristida longiseta*, *Agropyron smithii*, *Stipa comata*) and shrubs (e.g., *Gutierrezia sarothrae*, *Chrysothamnus nauseosus*, *Artemesia frigida*).	Documented
Mountain plover	*Charadrius montanus*	BLM S	Prairie dog colonies and other shortgrass prairie sites are confirmed as preferred breeding habitat. Strong preference was also given to sites with slopes less than 5% and grass height of less than 3 inches.	Documented
Peregrine falcon	*Falco peregrinus*	BLM S	Found in open landscapes with cliffs which serve as nesting sites.	Documented
Piping plover	*Charadrius melodus*	FT	Nests on sand or pebble beaches on freshwater and saline wetlands, lakes, reservoirs, and rivers. Only nests in areas with sparse to no vegetation. Summer range primarily in northeastern Montana with isolated population in Pondera County.	Documented
Red-headed woodpecker	*Melanerpes erythrocephalus*	BLM S	Along major rivers having riparian forest. Open savannah country w/ ground cover, snags and canopy cover. Large burns also utilized. Nest in holes excavated 2 to 25 meters above ground by both sexes in live trees, dead stubs, utility poles, or fence posts. Individuals nest in the same cavity in successive years.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Red knot	*Calidris canutus*	BLM S	Breeds in drier tundra areas, often in sparsely vegetated hillsides. Nesting occurs in ground depressions.	Documented.
Sagebrush sparrow	*Artemisiospiza nevadensis*	BLM S	Found in chaparral, sagebrush, and other open habitats with shrub components.	Documented
Sage thrasher	*Oreoscoptes montanus*	BLM S	Sagebrush obligate in Montana. Abundance is generally positively correlated with the amount of sage cover and negatively correlated with grass cover.	Documented
Sprague's pipit	*Anthus spragueii*	BLM S/FC	Native, medium to intermediate height prairie and in a short grass prairie landscape, can often be found in areas with taller grasses. More abundant in native prairie than in exotic vegetation; area sensitive, requiring relatively large areas of appropriate habitat; the minimum area requirement in a Saskatchewan study was 470 acres. Known to utilize and breed in alkaline meadows and around the edges of alkaline lakes.	Documented
Veery	*Catharus fuscescens*	BLM S	Breeding occurs in deciduous woodlands and forest habitats with well-developed understory. Often found near water sources such as rivers, streams, and swampy areas.	Documented
White-faced ibis	*Plegadis chihi*	BLM S	Freshwater wetlands, including ponds, swamps and marshes with pockets of emergent vegetation. Also use flooded hay meadows and agricultural fields as feeding locations. Nest in areas where water surrounds emergent vegetation, bushes, shrubs, or low trees. Use old stems in cattails (*Typha* spp.), hardstem bulrush (*Scirpus acutus*) or alkali bulrush (*S. paludosus*) over shallow water as their nesting habitat.	Documented
Reptiles				
Greater short-horned lizard	*Phrynosoma hernandesi*	BLM S	Ridge crests between coulees, and in sparse, short grass and sagebrush with sun-baked soil. Limestone outcrops in canyon bottoms of sandy soil with an open canopy of limber pine-Utah juniper, and are also present on flats of relatively pebbly or stony soil with sparse grass and sagebrush cover.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Milk snake	*Lampropeltis triangulum*	BLM S	Open sagebrush-grassland habitat and ponderosa pine savannah with sandy soils, most often in or near areas of rocky outcrops and hillsides or badland scarps, sometimes within city limits.	Documented
Spiny softshell turtle	*Apalone spinifera*	BLM S	Freshwater rivers, lakes, marshes, and farm ponds. Open habitats with small amounts of vegetation and sandy or mud bottoms are preferred.	Documented
Western hog-nosed snake	*Heterodon nasicus*	BLM S	Apparent preference for arid areas, farmlands, and floodplains, particularly those with gravelly or sandy soil, has been noted. They occupy burrows or dig into soil, and less often are found under rocks or debris, during periods of inactivity.	Documented
Amphibians				
Great Plains toad	*Bufo cognatus*	BLM S	Sagebrush-grassland, rainwater pools in road ruts, in stream valleys, at small reservoirs and stock ponds, and around rural farms; breeding has been documented in small reservoirs and backwater sites along streams. Appears to prefer stock tanks and roadside ponds rather than floodplains. Eggs and larvae develop in shallow water, usually clear or slightly turbid, but not muddy.	Documented
Plains spadefoot	*Spea bombifrons*	BLM S	Soft sandy/gravelly soils near permanent or temporary bodies of water. Lives largely inactive in its burrows or occupies rodent burrows, and enters water only to breed. Following heavy rains, adults have been reported in water up to 30 centimeters deep in flooded wagon wheel ruts, temporary rain pools formed in wide flat-bottom coulees, water tanks, and badland seep ponds. Tadpoles and toadlets have been observed in stock ponds and small ephemeral reservoirs, usually in sagebrush-grassland habitats.	Documented

Table L-1
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status[1]	General Habitat	Likelihood of Occurrence
Western toad	*Anaxyrus boreas boreas*	BLM S	Utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms.	Documented

Source:

- Montana/Dakotas Special Status Species List. Instruction Memorandum No. MT-2014-067.
- Endangered, Threatened, Proposed and Candidate Species Montana Counties. Ecological Services Montana Field Office. Internet website: http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species.html. Accessed on August 21, 2012.
- Endangered, Threatened, Proposed and Candidate Species, Montana Counties. Updated October 2014. Internet website: http://www.fws.gov/montanafieldoffice/endangered_species/listed_species/countylist.pdf. Accessed on November 13, 2014.

[1]FE—Federally listed as endangered; FT—Federally listed as threatened; FC—Federal listed as a candidate species; FC (w)—Federal candidate species warranted for listing; SE—State listed as endangered; ST—State listed as threatened; SC—State listed as species of special concern (no legal status); BLM S—BLM Sensitive; FS—Forest Service Sensitive

Appendix M

Applying Lek Buffer-Distances When Approving Actions

APPENDIX M
APPLYING LEK BUFFER-DISTANCES WHEN APPROVING ACTIONS

BUFFER DISTANCES AND EVALUATION OF IMPACTS TO LEKS

Evaluate impacts to leks from actions requiring National Environmental Policy Act (NEPA) analysis. In addition to any other relevant information determined to be appropriate (e.g. State wildlife agency plans), the BLM would assess and address impacts from the following activities using the lek buffer-distances as identified in the US Geological Survey (USGS) Report *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review* (Open File Report 2014-1239). The BLM would apply the lek buffer-distances specified as the lower end of the interpreted range in the report unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek buffer-distances is as follows:

- linear features (roads) within 3.1 miles of leks
- infrastructure related to energy development within 3.1 miles of leks
- tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks
- low structures (e.g., fences, rangeland structures) within1.2 miles of leks
- surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks
- noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts. The USGS report recognized "that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range". The USGS report also states that "various protection measures have been developed and implemented… [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands". All variations in lek buffer-distances would require appropriate analysis and disclosure as part of activity authorization.

In determining lek locations, the BLM would use the most recent active or occupied lek data available from the state wildlife agency.

FOR ACTIONS IN GENERAL HABITAT MANAGEMENT AREA (GHMA)

The BLM would apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis.

- Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above
- The BLM may approve actions in GHMA that are within the applicable lek buffer distance identified above only if::
  - Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance other than the applicable distance identified above offers the same or a greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or
  - The BLM determines that impacts to GRSG and its habitat are minimized such that the project would cause minor or no new disturbance (ex. co-location with existing authorizations); and
  - Any residual impacts within the lek buffer-distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the Mitigation Strategy (Appendix G of the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS).

FOR ACTIONS IN PRIORITY HABITAT MANAGEMENT AREA (PHMA)

The BLM would apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in PHMA that are within the applicable lek buffer distance identified above only if:

- The BLM, with input from the state fish and wildlife agency, determines, based on best available science, landscape features, and other existing protections, that a buffer distance other than the distance identified above offers the same or greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area.

Range improvements which do not impact GRSG, or, range improvements which provide a conservation benefit to GRSG such as fences for protecting important seasonal habitats, meet the lek buffer requirement.

The BLM would explain its justification for determining the approved buffer distances meet these conditions in its project decision.

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Appendix N

Greater Sage-Grouse (GRSG) Disturbance Caps

APPENDIX N
GREATER SAGE-GROUSE (GRSG) DISTURBANCE CAPS

In the US Fish and Wildlife Service's (USFWS) 2010 listing decision for Greater Sage-Grouse (GRSG), the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of GRSG's habitat or range (75 FR 13910 2010). The 18 threats have been aggregated into three measures:

- Sagebrush availability (percent of sagebrush per unit area)
- Habitat degradation (percent of human activity per unit area)
- Density of energy and mining (facilities and locations per unit area)

Habitat degradation, and density of energy and mining will be evaluated under the disturbance cap and density cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the National Environmental Policy Act (NEPA) process for projects authorized or undertaken by the BLM.

DISTURBANCE CAP

This resource management plan (RMP) amendment has incorporated a 3 percent anthropogenic disturbance cap within GRSG Priority Habitat Management Areas (PHMA) and the subsequent land use planning actions if the cap is met:

> *If the 3 percent anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG Priority PHMA in any given Biologically Significant Unit (BSU), then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) will be permitted by BLM within GRSG PHMA in any given BSU until the disturbance has been reduced to less than the cap.*

If the 3 percent disturbance cap is exceeded on all lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5 percent within a proposed project analysis area in PHMA, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the 1872 hard rock Mining Law, valid existing rights, etc.). If the BLM determines that the State of Montana's GRSG Habitat Conservation Program contains comparable components to those found in the State of Wyoming's Density and Disturbance model (an all lands approach for calculating anthropogenic disturbances, a clear methodology for measuring the density of operations, and a fully operational Density Disturbance Calculation Tool), the 3 percent disturbance cap will be converted to a 5 percent cap.

The disturbance cap applies to the PHMA within both the BSU and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (**Table N-1**, Anthropogenic Disturbance Types for Disturbance Calculations) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the RMPs are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3 percent disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to GRSG and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

- For the BSUs:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1]) ÷ (acres of all lands within the PHMAs in a BSU) x 100.

- For the Project Analysis Area:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1] plus the 7 site scale threats[2] and acres of habitat loss[1]) ÷ (acres of all lands within the PHMA in the project analysis area) x 100.

[1]See **Table N-1**.
[2]See **Table N-2**, The Seven Site Scale Features Considered Threats to Sage-Grouse Included in the Disturbance Calculation for Project Authorizations

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not GRSG seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding GRSG seasonal habitats, sagebrush availability, and areas with the potential to support GRSG populations will be considered along with other local conditions that may affect GRSG during the analysis of the proposed project area.

DENSITY CAP

This RMP amendment has also incorporated a cap on the density of energy and mining facilities at an average of one facility per 640 acres in the PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than one facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of one facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.). Facilities included in the density calculation (**Table N-3**, Relationship Between the 18 Threats and the Three Habitat Disturbance Measures for Monitoring and Disturbance Calculations) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

Project Analysis Area Method for Permitting Surface Disturbance Activities

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile

project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.

- Digitize all existing anthropogenic disturbances identified in **Table N-1**, the seven additional features that are considered threats to GRSG (**Table N-2**), and areas of sagebrush loss. Using one meter resolution NAIP imagery is recommended. Use existing local data if available.
- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3 percent anthropogenic disturbance or 5 percent total disturbance, proceed to next step. If existing disturbance is greater than 3 percent anthropogenic disturbance or 5 percent total disturbance, defer the project.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3 percent anthropogenic disturbance or 5 percent total disturbance, proceed to next step. If disturbance is greater than 3 percent anthropogenic disturbance or 5 percent total disturbance, defer project.
- Calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than one facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than one facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.
- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

Table N-1
Anthropogenic Disturbance Types for Disturbance Calculations
Data Sources are Described for the West-Wide Habitat Degradation Estimates

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Table N-2
The Seven Site Scale Features Considered Threats to Sage-Grouse Included in the Disturbance Calculation for Project Authorizations

1. Coalbed Methane Ponds
2. Meteorological Towers
3. Nuclear Energy Facilities
4. Airport Facilities and Infrastructure
5. Military Range Facilities & Infrastructure
6. Hydroelectric Plants
7. Recreation Areas Facilities and Infrastructure

Definitions:

1. **Coalbed Methane and other Energy-related Retention Ponds –** The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.
2. **Meteorological Towers –** This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.
3. **Nuclear Energy Facilities –** The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
4. **Airport Facilities and Infrastructure (public and private) –** The footprint boundary will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.
5. **Military Range Facilities & Infrastructure –** The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.
6. **Hydroelectric Plants –** The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
7. **Recreation Areas & Facilities –** This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

Table N-3
Relationship Between the 18 Threats and the Three Habitat Disturbance Measures for Monitoring and Disturbance Calculations

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

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Appendix O

Response to Comments on the Draft Resource Management Plan Amendment/Environmental Impact Statement

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APPENDIX O
RESPONSE TO COMMENTS ON THE DRAFT RESOURCE MANAGEMENT PLAN AMENDMENT/ ENVIRONMENTAL IMPACT STATEMENT

O.1 INTRODUCTION

After publishing the Lewistown Field Office Greater Sage-Grouse Draft Resource Management Plan Amendment (RMPA)/Environmental Impact Statement (EIS), the US Department of the Interior, Bureau of Land Management (BLM) conducted a public comment period from November 8, 2013, to February 5, 2014. The BLM received written comments by mail, e-mail, and submission at the public meetings. Comments covered a spectrum of thoughts, opinions, ideas, and concerns. The BLM recognizes that commenters invested considerable time and effort to submit comments on the Draft RMPA/EIS and has developed a comment analysis methodology to ensure that all comments were considered as directed by the National Environmental Policy Act (NEPA) regulations.

According to NEPA, the BLM is required to identify and formally respond to all substantive public comments. The BLM developed a systematic process for responding to comments to ensure all substantive comments were tracked and considered. Upon receipt, each comment letter was assigned an identification number and logged into the BLM's comment analysis database, CommentWorks, which allowed the BLM to organize, categorize, and respond to comments. Substantive comments from each letter were coded to appropriate categories based on the content of the comment, retaining the link to the commenter. The categories generally follow the sections presented in the Draft RMPA/EIS, though some relate to the planning process or editorial concerns.

Comments similar to each other were grouped under a topic heading, and the BLM drafted a statement summarizing the issues contained in the comments.

The responses were crafted to respond to the comments, and, if warranted, a change to the EIS was made in the Proposed RMPA/Final EIS.

Although each comment letter was diligently considered, the comment analysis process involved determining whether a comment was substantive or nonsubstantive in nature. In performing this analysis, the BLM relied on the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR], Part 1503.4) to determine what constituted a substantive comment.

A substantive comment does one or more of the following:

- Questions, with a reasonable basis, the accuracy of the information and/or analysis in the Draft RMPA/EIS
- Questions, with a reasonable basis, the adequacy of the information and/or analysis in the Draft RMPA/EIS
- Presents reasonable alternatives other than those presented in the Draft RMPA/EIS that meet the purpose and need of the proposed action and addresses significant issues
- Questions, with a reasonable basis, the merits of an alternative or alternatives
- Causes changes in or revisions to the proposed action
- Questions, with a reasonable basis, the adequacy of the planning process itself

Additionally, the BLM's NEPA Handbook (H-1790-1) identifies the following types of substantive comments:

- Comments on the Adequacy of the Analysis: Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate are substantive in nature but may or may not lead to changes in the Proposed RMPA/Final EIS. Interpretations of analyses should be based on professional expertise. Where there is disagreement within a professional discipline, a careful review of the various interpretations is warranted. In some cases, public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the manager responsible for preparing the EIS (Authorized Officer) does not think that a change is warranted, the response should provide the rationale for that conclusion.
- Comments That Identify New Impacts, Alternatives, or Mitigation Measures: Public comments on a Draft EIS that identify impacts, alternatives, or mitigation measures that were not addressed in the draft are substantive. This type of comment requires the Authorized

Officer to determine whether it warrants further consideration. If it does, the Authorized Officer must determine whether the new impacts, new alternatives, or new mitigation measures should be analyzed in the Final EIS, a supplement to the Draft EIS, or a completely revised and recirculated Draft EIS.

- Disagreements with Significance Determinations: Comments that directly or indirectly question, with a reasonable basis, determinations regarding the significance or severity of impacts are substantive. A reevaluation of these determinations may be warranted and may lead to changes in the Final EIS. If, after reevaluation, the Authorized Officer does not think that a change is warranted, the response should provide the rationale for that conclusion.

Comments that failed to meet the above description were considered nonsubstantive. Many comments received throughout the process expressed personal opinions or preferences, had little relevance to the adequacy or accuracy of the Draft RMPA/EIS, represented commentary regarding resource management and/or impacts without any real connection to the document being reviewed, or were considered out of scope because they dealt with existing law, rule, regulation, or policy. These comments did not provide specific information to assist the Lewistown Field Office Greater Sage-Grouse planning team in making changes to the alternatives or impact analysis in the Draft RMPA/EIS and are not addressed further in this document. Examples of nonsubstantive comments include the following:

- The best of the alternatives is Alternative D (or A, B, or C).
- The preferred alternative does not reflect balanced land management.
- The BLM needs to change the Taylor Grazing Act and charge higher grazing fees.
- I want the EIS to reflect the following for this area: no grazing, no drilling, no mining, and no off-highway vehicles (OHV).
- More areas should be made available for multiple uses (drilling, OHVs, right-of-ways [ROW)]) without severe restrictions.

Opinions, feelings, and preferences for one element or one alternative over another, and comments of a personal and/or philosophical nature, were all read, analyzed, and considered. However, because such comments are not substantive in nature, the BLM did not include them in the report and did not respond to them. While all comments were reviewed and considered, comments were not counted as "votes" that would determine what action BLM would take under the Proposed RMPA/Final EIS. The NEPA public comment period is neither considered an election, nor does it result in a representative sampling of the

population. Therefore, public comments are not appropriate to be used as a democratic decision-making tool or as a scientific sampling mechanism.

Comments citing editorial changes to the document were reviewed and incorporated where appropriate.

Copies of all comment documents received on the Draft RMPA/EIS are available by request from the BLM's Montana State Office. Comments received by mail, email, and at meetings, or delivered orally during the public meetings, are tracked by commenter name and submission number.

O.1.1 Campaign Letters

Several organizations and groups held standardized letter campaigns for the National Greater Sage-Grouse Planning Strategy through which their constituents were able to submit the standard letter or a modified version of the letter indicating support for the group's position on the BLM RMPA actions. Individuals who submitted a modified standard letter generally added new comments or information to the letter or edited it to reflect their main concern(s). Modified letters with unique comments were given their own letter number and coded appropriately. All commenters who used an organization's campaign letter were tracked in the BLM commenter list, and these letters are available from the BLM upon request.

O.1.2 How This Appendix is Organized

This appendix is divided into three main sections. The first section, Introduction, provides an overview of the comment response process. The second section, Topics, Responses, and Comments, is organized by the primary topic and then by specific issue subtopics that relate to an aspect of NEPA, the BLM planning process, or specific resources and resource uses. For example, all comments that relate to aspects of the National Environmental Policy Act fall under the heading **O.2.1**, NEPA. This includes subsections such as cooperating agencies, range of alternatives, and Geographic Information Systems (GIS) data and analysis. You can find the comments related to Greater Sage-Grouse under the heading **O.2.3**, Greater Sage-Grouse. Each topic or subtopic contains a summary statement, and the BLM's response to the summary statement.

The third section, **O.3**, Commenter List, provides the names of individuals who submitted unique comment letters (not campaign letters) on the Draft RMPA/EIS. Comment submissions are indexed and listed alphabetically by the commenter's last name.

Note: In the Lewistown Field Office Greater Sage-Grouse Draft RMPA/EIS, Alternatives B, C, and D delineated priority habitat (PH) and general habitat (GH). In the Proposed RMPA/Final EIS, PH has been changed to priority habitat management areas (PHMA), and GH has been changed to general habitat management areas (GHMA). The boundaries of these areas have not changed. Similar to the Draft RMPA/EIS, the areas delineated as PHMA and GHMA would

be the same under Alternatives B, C, and D and the Proposed Plan Amendment in the Final EIS. Because the public comments refer to the Draft RMPA/EIS, the terms PH and GH are used in comment summaries in **Section O.2**, Topics, Responses, and Comments. However, PH and GH have been replaced with PHMA and GHMA in the comment responses.

O.2 TOPICS, RESPONSES, AND COMMENTS

O.2.1 NEPA

Summary
The BLM has not provided consistency between all the sub-regional efforts; there are vastly different proposed management prescriptions to conserve the species.

Response
While there was consistent direction provided in alternative development, such as BLM Washington Office (WO) Instruction Memorandum (IM) 2012-044, variation across sub-regions was needed to accommodate the local issues and specific state requirements, as well as public comments provided on the Lewistown Field Office Greater Sage-Grouse Draft RMPA/EIS. The best available science will guide Greater Sage-Grouse (GRSG) objectives utilized for all sub-regions.

Cooperating Agency Relationships

Summary
The BLM should work with local cooperating agencies if local field office objectives are developed in the future.

Response
As the decisions under consideration by the BLM are programmatic in nature and would not result in on-the-ground planning decision or actions, the scope of the management actions were considered at a broad, programmatic level. As specific actions come under consideration, such as future local management actions to implement the broad objectives and goals presented here, the BLM would conduct subsequent NEPA analyses that may include future coordination with local cooperating agencies. In addition, as required by NEPA, the public would be offered the opportunity to participate in the NEPA process for any site-specific actions.

Range of Alternatives

Summary
The comments focused on several issues related to the alternatives presented in the Draft RMPA/EIS:

1. Commenters believed that the stated purpose and need is overly narrow, and that the goals and objectives presented in the alternatives would not meet the purpose for the action, namely conservation of the GRSG.
2. The BLM should modify the alternatives several ways, including changing the conservation alternative (Alternative C) to include only those elements that were provided by the conservation organizations; include a reduced grazing alternative that includes a 50 percent reduction in actual use; and an alternative that would not include universal closures and no surface occupancy (NSO) stipulations to areas available for leasing.

Response

1. CEQ regulations direct that an EIS "…shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 CFR, Part 1502.13). Also, under the CEQ regulations, the BLM is required to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by section 102(2)(E) of the Act [NEPA]" (40 CFR, Part 1501.2(c)). The breadth or narrowness of the purpose and need statement has a substantial influence on the scope of the subsequent analysis. The purpose and need statement provides a framework for issue identification and will inform the rationale for alternative selection. The range of alternatives developed are intended to meet the purpose and need and address the issue, thereby providing a basis for eventual selection of an alternative in a decision (BLM NEPA Handbook). An agency's refusal to consider proposed alternatives does not mean that an alternatives analysis is deficient, as long as the agency provides an explanation for why the proposed alternative was not considered in depth. See *Western Watershed Projects et al. vs. BLM* (No. 2:10-CV-02896-KJM-KJN) and Earth Island Inst., 697 F.3d at 1022–23.

   The BLM is preparing RMPAs with associated EISs for RMPs applied to lands with GRSG habitat (see Section 1.2 of the Proposed RMPA/Final EIS). This effort responds to the US Fish and Wildlife Service's (USFWS) March 2010 'warranted, but precluded' Endangered Species Act (ESA) listing petition decision, which stated that existing regulatory mechanisms in BLM land use plans was inadequate to protect the species and its habitat.

   The draft alternatives and Proposed Plan Amendment in the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS would focus on areas affected by threats to GRSG habitat identified by the USFWS in the March 2010 listing decision. The

primary threat to sagebrush habitat in Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) 1 and specifically within the Yellowstone Watershed population as identified in the Conservation Objectives Team (COT) report is conversion of sagebrush to agricultural lands or other land uses. Infrastructure from energy development also represents a threat. To address the threats, BLM considered a range of changes in the draft alternatives and Proposed Plan Amendment for management of GRSG habitat to avoid the continued decline of populations and habitats across BLM-administered lands. This purpose and need provides the appropriate scope to allow the BLM to analyze a reasonable number of alternatives to cover the full spectrum of potential impacts.

2. The BLM considered a reasonable range of alternatives during the Lewistown Field Office Greater Sage-Grouse planning process in full compliance with the NEPA. The CEQ regulations (40 CFR, Part 1502.1) require that the BLM consider reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. While there are many possible alternatives or actions to manage public lands and GRSG in the planning area, the BLM fully considered the planning issues and criteria developed during the scoping process to determine a reasonable range of alternatives. As a result, four alternatives were analyzed in detail in the Draft RMPA/EIS that best addressed the issues and concerns identified by the affected public. The range of alternatives in the Draft RMPA/EIS represented a full spectrum of options including a no action alternative (current management, Alternative A)

   During scoping for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS, conservation groups submitted management direction recommendations for protection and conservation of GSG and their habitat. These recommendations, in conjunction with resource allocation opportunities and internal sub-regional BLM input, were reviewed to develop the management direction for GRSG under Alternative C. In accordance with IM 2012-169 and BLM's Land Use Planning Handbook, the BLM considered what range of alternatives was necessary to address unresolved conflicts among available resources. The WO IM states that BLM should analyze either a reduced or no-grazing alternative. The BLM chose to analyze no grazing alternative, instead of a reduced grazing alternative. The no grazing alternative was analyzed because of the number of allotments in the planning area not meeting land health standards. Also, because of the intermingled land pattern, the BLM would need to install fencing where allotments are adjacent to non-BLM-administered lands for either a no grazing alternative or a reduced grazing alternative. The alternative submitted by the conservation

groups was revised to meet the needs of the Lewistown Field Office RMPA/EIS; therefore, all their suggestions were not included verbatim in Alternative C.

As stated in Section 1.3 of the Proposed RMPA/Final EIS, there is an existing protest resolution decision affecting lands managed within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PH and GH, or PHMA and GHMA. Existing fluid mineral leases within GRSG habitat that expire can be re-nominated for leasing, but would be deferred as described above. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing is not be addressed in this RMPA/EIS.

Best Available Data

Summary
The BLM must clearly state in the Final EIS what information is not available for the analysis per NEPA regulations, 43 CFR, Part 1502.22(b).

Response
The CEQ established implementing regulations for NEPA, requiring that a Federal agency identify relevant information that may be incomplete or unavailable for evaluating reasonably foreseeable significant adverse impacts in an EIS (40 CFR, Part 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an EIS. Knowledge and information is, and will always be, incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the Lewistown RMPA/EIS. The BLM made considerable effort to acquire and convert resource data from the BLM and from outside sources, into digital format for use in the RMPA/EIS.

Under FLPMA, the inventory of public land resources is ongoing and continuously updated. However, certain information is sometimes unavailable for use in developing the RMPA/EIS because inventories either have not been conducted or are out of date, for example vegetation cover changes due to wildfire.

For these resources, estimates were made concerning the number, type, and significance of these resources based on previous surveys and existing

knowledge. In addition, some impacts cannot be quantified, given the proposed management actions. Where this gap occurs, impacts are projected in qualitative terms or, in some instances, are described as unknown. Subsequent site-specific project-level analysis would provide the opportunity to collect and examine site-specific inventory data to determine appropriate application of planning guidance. In addition, the BLM and other agencies in the planning area continue to update and refine information used to implement these plans. The BLM is not aware of any incomplete or unavailable information.

Cumulative Impacts

Summary
The Draft EIS failed to identify reasonably foreseeable future actions for renewable energy in the cumulative effects analysis.

Response
The BLM thoroughly explained its consideration and analysis of cumulative effects in the Draft RMPA/EIS in Section 5.1. The Lewistown Field Office Greater Sage-Grouse RMPA/EIS considers the present effects of past actions, to the extent that they are relevant, and present and reasonably foreseeable (not highly speculative) federal and non-federal actions, taking into account the relationship between the proposed alternatives and these reasonably foreseeable actions. This discussion summarizes CEQ guidance from June 24, 2005, stating that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." This is because a description of the current state of the environment inherently includes the effects of past actions. Information on the current conditions is more comprehensive and more accurate for establishing a useful starting point for cumulative effects analysis. The CEQ interpretation was accepted by the Ninth Circuit Court in *NW Envtl. Advoc. v. Nat'l Marine Fisheries Serv.*, 460 F.3d 1125, 1141 (9th Cir. 2006). The BLM explicitly described their assumptions regarding proposed projects and other reasonably foreseeable future actions.

The BLM has complied fully with the requirements of 40 CFR, Part 1508.7 and prepared a cumulative impact analysis to the extent possible based on the broad nature and scope of the proposed management options under consideration at the land use planning level.

As described in Section 5.2.2 of the Proposed RMPA/Final EIS, projects and activities for consideration in the cumulative effects analysis are evaluated on the basis of 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. Based on this evaluation, no renewable energy projects were identified in the Lewistown Field Office planning area. The cumulative effects analysis in Section 5.3 was revised in

the Proposed RMPA/Final EIS to include a cumulative effects analysis on GRSG at the WAFWA Management Zone level. One utility-scale wind development in Management Zone IV was considered in this analysis.

Mitigation Measures

Summary
The BLM should consider additional mitigation measures. Commenters also requested the Proposed RMPA/Final EIS clarify what type of development the RDFs in Appendix C and D apply to. Also, the Proposed RMPA/Final EIS should provide measurable objectives for mitigation, including "triggers" and measures of success.

Response
The BLM complied with the NEPA by including a discussion of measures that may mitigate adverse environmental impacts of the alternatives in the Draft RMPA/EIS. See 40 CFR, Parts 1502.14(f), 1502.16(h). Potential forms of mitigation include: 1) avoiding the impact altogether by not taking a certain action or parts of an action; 2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; 3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or 5) compensating for the impact by replacing or providing substitute resources or environments (40 CFR, Part 1508.20). The BLM must include mitigation measures in an EIS pursuant to the NEPA; yet the BLM has full discretion in selecting which mitigation measures are most appropriate, including which forms of mitigation are inappropriate.

Section 2.6.2 and Table 2-5 in the Proposed RMPA/Final EIS identify what type of management actions the RDFs in Appendices C and D would apply to.

Mitigation would be applied to all implementation actions/decisions that take place on federal lands within GRSG habitat during the life of this plan. Mitigation is further defined in Appendix G of the Proposed RMPA/Final EIS. The Regional Mitigation Strategy was developed to follow the BLM's Regional Mitigation Manual MS-1794, and CEQ 40 CFR, Part 1508.20.

The Regional Mitigation Strategy, through the mitigation hierarchy, guides the BLM. The hierarchy direction is to: 1) avoid impacts entirely by not taking a certain action or parts of an action; 2) if unable to avoid, minimize impacts by limiting the degree or magnitude of an action or parts of an action; and 3) if avoidance or minimizing is not possible, compensate impacts associated with future implementation actions. If residual impacts on GRSG from implementation-level actions remain after applying avoidance or minimization measures, then compensatory mitigation projects would be used to offset the residual impacts in an effort to achieve the land use plan goals and objectives. As articulated in Appendix G of the Proposed RMPA/Final EIS, compensatory

mitigation would occur on sites that have the potential to yield the greatest conservation benefit to the GRSG, regardless of land ownership. These sites should be sufficiently "durable." According to BLM Manual Section 1794, durability is defined as "the administrative, legal, and financial assurances that secure and protect the conservation status of a compensatory mitigation site, and the ecological benefits of a compensatory mitigation project, for at least as long as the associated impacts persist."

Specific mitigation strategies, based on the Regional Mitigation Strategy, would be developed by regional teams (at the WAFWA MZ level) within one year of the issuance of the Record of Decision (ROD). These strategies would guide the application of the mitigation hierarchy to address GRSG impacts in that WAFWA MZ. The WAFWA MZ Regional Mitigation Strategy would be applicable to BLM-administered lands within the zone's boundaries. Subsequently, the BLM's NEPA analysis for implementation-level decisions that might impact GRSG would include analysis of mitigation recommendations from the relevant WAFWA MZ Regional Mitigation Strategy(ies).

The Greater Sage-Grouse Monitoring Framework in Appendix B of the Proposed RMPA/Final EIS outlines the methods that the BLM would use to monitor and evaluate the implementation and effectiveness of the plan to conserve the species and their habitat. The regulations for the BLM (43 CFR, Part 1610.4-9) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations, based on the sensitivity of the resource to the decisions involved.

Implementation monitoring results would provide information to allow the BLM to evaluate the implementation of decisions from the BLM RMPs to conserve GRSG and its habitat. Effectiveness monitoring would provide the information to evaluate whether BLM actions achieve the objective of the planning strategy (BLM IM 2012-044), which is to conserve GRSG populations and their habitats.

Monitoring efforts would include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. This information would assist the BLM with identifying whether or not they are achieving their land use plan goals and objectives, reaching an adaptive management soft or hard trigger, as well as providing information relative to the density and disturbance caps.

O.2.2 Federal Land Policy and Management Act

Summary

The Draft RMPA/EIS was overly focused on protecting GRSG and does not meet Federal Land Policy and Management Act's (FLPMA) multiple use mandate.

Response
The BLM's FLPMA (Section 103(c)) defines "multiple use" as the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people. Accordingly, the BLM is responsible for the complicated task of striking a balance among the many competing uses to which public lands can be put. The BLM's multiple-use mandate does not require that all uses be allowed on all areas of the public lands. The purpose of the mandate is to require the BLM to evaluate and choose an appropriate balance of resource uses, which involves tradeoffs between competing uses. The FLPMA also directs the BLM to develop and periodically revise or amend its RMPs, which guide management of BLM-administered lands, and provides an arena for making decisions regarding how public lands would be managed and used.

The Lewistown Field Office Greater Sage-Grouse RMPA is a targeted amendment specifically addressing goals, objectives, and conservation measures to conserve GRSG and to respond to the potential of it being listed (see Proposed RMPA/Final EIS Section 1.2). The BLM's planning processes allows for analysis and consideration of a range of alternatives in the Proposed RMPA/Final EIS that identify and incorporate appropriate regulatory mechanisms to conserve, enhance, and restore GRSG habitat and to eliminate, reduce, or minimize threats to this habitat to ensure that a balanced management approach was recommended. Section 3.4.2 of the Proposed RMPA/Final EIS provides an overview of current uses on public lands that may threaten GRSG habitat and populations. The Proposed RMPA/Final EIS includes alternatives that provide a greater and lesser degree of restrictions in various use programs, but would not eliminate or invalidate any valid existing development rights. Valid existing rights are discussed in Section 1.7 and several locations throughout Chapter 4 of the Proposed RMPA/Final EIS.

Additionally, the BLM developed the Lewistown Field Office Sage-Grouse Draft RMPA/EIS with involvement from 12 cooperating agencies (see Section 6.3 of the Proposed RMPA/Final EIS), including USFWS, Montana Fish, Wildlife and Parks (MFWP), Montana Department of Natural Resources and Conservation, US Forest Service, county commissioners, and Cooperative State Grazing Districts to ensure a balanced multiple-use management strategy to address the protection of GRSG while allowing for use of renewable and nonrenewable resources on the public lands.

Inventories

Summary
Commenters suggested that the Draft RMPA/EIS provide inventories of public lands, and their resources and values.

Response

The CEQ regulations require an environmental impact statement to "succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. The description shall be no longer than is necessary to understand the effects of the alternatives. Data and analyses in an EIS shall be commensurate with the importance of the impact, with less important material summarized, consolidated, or simply referenced. Agencies shall avoid useless bulk in statements and shall concentrate effort and attention on important issues" (40 CFR, Part 1502.15). Additionally, the Lewistown Field Office Greater Sage-Grouse RMPA is a programmatic NEPA effort to conserve GRSG and its habitat across a broad geographic area. As such, the BLM described the current conditions and trends in the affected environment broadly, across a range of conditions, appropriate to program-level land use planning actions.

The BLM complied with these regulations in describing the affected environment. The requisite level of information necessary to make a reasoned choice among the alternatives in an EIS is based on the scope and nature of the proposed decision. The affected environment provided in Chapter 3 in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS is sufficient to support, at the general land use planning level of analysis, the environmental impact analysis resulting from management actions presented in the RMPA/EIS. For example, listing every water quality-impaired stream within the planning area by name would not provide useful information at this broad-scale analysis, particularly where the proposed plan alternatives did not vary the level of riparian protections to provide reduced levels for non-impaired streams. The riparian protections within each alternative were applied to all streams, whether or not they were water quality-impaired. However, understanding the miles of impaired BLM streams, as presented in the Proposed RMPA/Final EIS at Section 3.19.2, is useful in establishing a baseline by which the BLM may analyze the relative effects of each alternative's broad-based approach.

As specific actions come under consideration, the BLM would conduct subsequent NEPA analyses that would include site-specific project and implementation-level actions. Site-specific concerns and more detailed environmental descriptions would be addressed when project-level reviews are tiered to the analysis in this EIS (40 CFR, Part 1502.20, 40 CFR, Part 1508.28). In addition, as required by NEPA, the public would be offered the opportunity to participate in the NEPA process for any site-specific actions.

Consistency with Other State, County, or Local Plans

Summary

Commenters state that the BLM's actions considered in the alternatives conflict with local and state agency plans and policies, and that the BLM did not coordinate with agencies to ensure that conservation measures are as

consistent as possible with other planning jurisdictions. Commenters also state that in the Proposed RMPA/Final EIS the BLM should disclose the implications of the 2013 Draft Montana Greater Sage-Grouse Habitat Conservation Strategy (Montana Strategy); address Executive Order No. 2-2013, and explain how the document would correspond with the State of Montana GRSG population management objectives.

Response

The BLM land use plans and amendments must be consistent with officially approved or adopted resource-related plans of Indian tribes, other federal agencies, and state and local governments to the extent that these resource-related plans comport with FLPMA and other federal laws and regulations (see 43 CFR, Part 1610). The BLM worked closely with state and local governments during preparation of the Draft RMPA/EIS. The Proposed RMPA/Final EIS lists the cooperating agencies actively involved in the planning process in Section 6.3. As described in Section 6.3, starting on June 26, 2012, the BLM has conducted four meetings to date with cooperating agencies. The focus of the meetings was to explain the purpose and need for the RMPA/EIS and the process and to develop a sub-regional management alternative. The entities that were invited to become cooperating agencies were also encouraged to attend the scoping open houses and provide comments during the scoping period. In addition, agencies were invited to attend public meetings for the Draft RMPA/EIS and encouraged to submit comments on the Draft RMPA/EIS. Since release of the Draft RMPA/EIS, the BLM has continued to work closely with a broad range of governmental partners, including governors, state fish and wildlife agencies, the USFWS, Indian tribes, and county commissioners. Through this coordination, the BLM has developed a Proposed Plan Amendment that is consistent with state, Tribal, and local strategies to the maximum extent possible and ensures the long-term conservation of the GRSG.

The BLM works to find a balance among uses and needs as reflected in these local government plans and has done so in the preparation of the RMPA/EIS; a list of these plans can be found in Section 1.8 of the Proposed RMPA/Final EIS. Additional information on relationship to county land use plans has been added to the Proposed RMPA/Final EIS (Section 1.8.9). While the BLM is not obligated to seek consistency, the agency is required to document the inconsistencies between the proposed action and the other plans, policies, and/or controls in the decision record for the EIS. No known inconsistencies were identified.

The BLM coordinates with cooperating agencies commensurate with each agency's recognized jurisdiction or expertise. In areas where the State of Montana has clear jurisdiction, such as wildlife populations, the BLM has worked closely with that state agency. In cases where a county or agency has expertise, such as local county socioeconomic information, the BLM has worked closely with the group to incorporate the information into the EIS.

The Governor of the State of Montana issued Executive Order 10-2014, which created the Montana Sage Grouse Oversight Team (MSGOT) and the Montana Sage Grouse Habitat Conservation Program. The executive order outlines a number of conservation strategies for state agencies to follow for land uses and activities in GRSG habitat in addition to establishing the MSGOT and habitat conservation program. The state conservation efforts are complimentary to the conservation measures proposed in the BLM land use plans and when combined would provide conservation efforts across land ownership boundaries.

Other Laws

Summary
Commenters requested the BLM to explain why the 2011 GRSG IMs, which add substantive requirements to the National Strategy, and the Notice of Intent do not require conformity with the Administrative Procedure Act (APA). Additionally, commenters stated that the BLM should have conducted NEPA analysis on the 2011 IMs. Commenters also state that the Draft EIS did not meet the USFWS Policy for Evaluating Conservation Efforts (PECE) policy standards.

Response
IMs are temporary directives that supplement the BLM's permanent Manual sections, which provide direction for its programs. The 2011 GRSG IMs do not constitute legislative rules that require public notice and an opportunity for comment under the APA or require NEPA analysis.

The USFWS will evaluate the adequacy of the Lewistown Field Office Greater Sage-Grouse Proposed RMPA/Final EIS with respect to its determination as to whether a listing of the GRSG under the ESA as threatened or endangered is warranted.

O.2.3 Greater Sage-Grouse

NTT Report/Findings

Summary
Commenters asserted that the National Technical Team (NTT) report is inconsistent with the Federal Advisory Committee Act (FACA) and is biased against oil and gas development.

Response
An NTT was formed as an independent, science-based team to ensure that the best information about how to manage the GRSG is reviewed, evaluated, and provided to the BLM in the planning process. The group produced a report in December 2011 that identified science-based management considerations to promote sustainable GRSG populations. The NTT report (NTT 2011) used the best current scientific knowledge to guide the BLM planning efforts through

management considerations to ameliorate threats, focused primarily on priority GRSG habitats on public lands. The NTT report is a peer reviewed report compiled by recognized experts in their fields and uses accepted methodologies for programmatic broad-level planning analysis. The NTT is staying involved as the BLM works through the National Greater Sage-Grouse Planning Strategy to make sure that relevant science is considered, reasonably interpreted, and accurately presented, and that uncertainties and risks are acknowledged and documented.

Under FACA, any time a federal agency intends to establish, control, or manage a group that gives advice as a group and has at least one member who is not a federal, Tribal, state, or local government employee, the agency must comply with FACA and the related administrative guidelines developed by the General Services Administration. The NTT was composed of only federal and state government employees; therefore, FACA does not apply.

COT Report

Summary

Commenters had two distinct views regarding the COT report. One group considered the report lacking in scientific integrity, inconsistent with other laws and mandates, and not representative of the best available information. The other group suggested the Draft EIS was not fully consistent with and did not completely meet the COT report conservation objectives and therefore requires additional management actions or clarification to address those deficiencies.

Response

In March 2012, the USFWS initiated a collaborative approach to develop range-wide conservation objectives for the GRSG to inform the 2015 decision about the need to list the species and to inform the collective conservation efforts of the many partners working to conserve the species. In March 2013, this team of state and USFWS representatives released the COT report based upon the best scientific and commercial data available at the time that identifies key areas for GRSG conservation, key threats in those areas, and the extent to which they need to be reduced for the species to be conserved. The report serves as guidance to federal land management agencies, state GRSG teams, and others in focusing efforts to achieve effective conservation for this species. In addition to the COT report, the BLM used the NTT report and the Summary of Science, Activities, Programs, and Policies That Influence the Rangewide Conservation of Greater Sage-grouse (*Centrocercus urophasianus*) (referred to as the Baseline Environmental Report [BER]) as additional sources of baseline information and as a starting place for developing management objectives.

The BLM sought to develop a range of alternatives with management objectives and actions that are consistent with the conservation measures and objectives

outlined in the COT report. To conserve GRSG habitat, proposed management follows the basic principles of: 1) avoiding the impact of an activity; 2) minimizing impacts by limiting the degree of activity; and 3) mitigating for an impact by improving or enhancing GRSG habitat. Each of the alternatives considers different means for accomplishing this strategy. For example, some alternatives place greater emphasis on avoidance of impacts, whereas other alternatives place more emphasis on minimization and mitigation. The BLM met with partners during formulation of the Proposed RMPA/Final EIS to meet the COT objectives to the extent possible.

The Proposed Plan Amendment would maintain and enhance GRSG populations and habitat. The Proposed Plan Amendment would apply management actions, subject to valid existing rights, to other uses and resources, such as:

- Providing a framework for prioritizing areas in PHMA and GHMA for wildfire, invasive annual grass, and conifer treatments;
- Managing areas as ROW avoidance or exclusion for certain types of lands and realty uses, requiring specific design features, and limiting new development where a disturbance cap has been reached;
- Adjusting grazing practices, including temporary livestock removal, where GRSG habitat objectives are not being met; and
- Applying Conditions of Approval (COA) to existing fluid mineral leases in PHMA and GHMA, and closing PHMA to nonenergy leasable development and mineral material sales.

The Proposed Plan Amendment would also establish screening criteria and conditions for new anthropogenic activities in PHMA and GHMA to ensure a net conservation gain to GRSG. The Proposed Plan Amendment would reduce habitat disturbance and fragmentation through limitations on surface disturbing activities, while addressing changes in resource condition and use through monitoring and adaptive management.

Table 2-5 in the Proposed RMPA/Final EIS demonstrates how the BLM addressed the threats to the populations in the Lewistown Field Office planning area. Alternatives may reduce threats to varying degrees, but the primary and driving threats for the Yellowstone Watershed Population and Belt Mountains populations (Agriculture Conversion of private land) would remain. The COT report (page 65) further explains expectations for Yellowstone Watershed Population despite BLM efforts/restrictions for GRSG habitat within the Lewistown Field Office. Responses to the USFWS comments on how the alternatives meet the COT objectives are provided separately in the administrative record for the RMPA/EIS.

Range of Alternatives

Summary
Commenters suggested changes to the alternatives related to GRSG, including:

- Consideration for Important Bird Area boundaries and areas outside of GRSG habitat
- Additional lek buffers
- Changes to grazing management
- Inclusion of West Nile virus management measures
- Providing more regulatory certainty
- Including more guidance from the NTT report or public-proposed alternatives
- Fully considering the NTT report and Sage-grouse Recovery Alternative as presented by conservation groups

Response
Section 1.5 of the Proposed RMPA/Final EIS describes how the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process to develop a reasonable range of alternatives for the RMPA. The BLM complied with NEPA and the CEQ implementing regulations at 40 CFR, Part 1500 in the development of alternatives for the Draft RMPA/EIS, including seeking public input and analyzing reasonable alternatives (see also **Section O.2.1**, NEPA—Range of Alternatives, of this report). The alternatives include management options for the planning area that would modify or amend decisions made in the field office RMPs to meet the planning criteria, address issues and comments from cooperating agencies and the public, and provide a reasonable range of alternatives. Alternatives for GRSG management were also developed using the recommendations of the NTT report and COT report to offer a range of management approaches to maintain or increase GRSG abundance and distribution of GRSG by conserving, enhancing, or restoring the sagebrush ecosystem upon which GRSG populations depend (see **Section O.2.3**, Greater Sage-Grouse, of this report for more details). Since this is a plan amendment to address GRSG conservation, many decisions from the field office RMPs are acceptable and reasonable. In these instances, there was no need to develop alternative management prescriptions.

Suggested revisions have been reviewed and incorporated as appropriate to clarify alternatives (see Section 2.6.2 and Table 2-4 of the Proposed RMPA/Final EIS). Changes implemented in the Final EIS include the addition of SFAs, guidance for incorporating GRSG RMP decisions into grazing authorizations, vegetation objectives guidance, density and disturbance caps, mitigation guidance, and guidance for applying lek buffers when approving actions (see the

description of Changes from Draft RMPA to the Proposed RMPA in Section 1.9 of the Proposed RMPA/Final EIS).

Regulatory uncertainty would be addressed in subsequent site-specific NEPA, which would evaluate how proposed activities with applicable RDFs would impact GRSG, PHMA, and GHMA.

Best Available Information Baseline Data

Summary
Commenters suggested new or additional literature for the BLM to consider in the Final EIS. Topics commenters were concerned about include impacts from:

- Grazing disturbance, including stubble height requirements
- Energy development and disease
- Transmission lines
- Noise

Commenters were also concerned about GRSG habitat mapping, including suggesting clarifications or revisions to the habitat map and questioning how the map would be updated.

Response
Before beginning the Lewistown Field Office Greater Sage-Grouse RMPA/EIS and throughout the planning effort, the BLM considered the availability of data from all sources, adequacy of existing data, data gaps, and the type of data necessary to support informed management decisions at the land use plan level. The data needed to support broad-scale analysis of the planning area are substantially different than the data needed to support site-specific analysis of projects. The RMPA/EIS data and information are presented in map and table form and are sufficient to support the broad-scale analyses required for land use planning (see **Section O.2.1**, NEPA, of this report for more details).

The BLM used the most recent and best information available that was relevant to a land use planning-level analysis, including the Summary of Science, Activities, Programs, and Policies That Influence the Rangewide Conservation of Greater Sage-grouse (*Centrocercus urophasianus*) (BER; Manier et al. 2013), NTT report (NTT 2011), and COT report (USFWS 2013). Additionally, the BLM consulted with, collected, and incorporated data from other agencies and sources, including but not limited to the USFWS and MFWP.

The BLM gathered the necessary data essential to make a reasoned choice among the alternatives analyzed in detail in the Draft RMPA/EIS and provided an adequate analysis that led to an adequate disclosure of the potential environmental consequences of the alternatives (Chapter 4). As a result, the BLM has taken a "hard look," as required by the NEPA, at the environmental

consequences of the alternatives in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS to enable the decision maker to make an informed decision. Finally, the BLM has made a reasonable effort to collect and analyze all available data.

A land use planning-level decision is broad in scope and, therefore, does not require an exhaustive gathering and monitoring of baseline data (BLM Land Use Planning Handbook H-1601-1, Chapter II, A-B at 11-13). Although the BLM realizes that more data could always be gathered, the baseline data provides the necessary basis to make informed land use plan-level decisions. Land use plan-level analyses are typically broad and qualitative rather than quantitative or focused on site-specific actions (BLM Land Use Planning Handbook H-1601-1, Chapter II, A-B at 11-13). The BLM would conduct subsequent project-specific NEPA analyses for projects proposed for implementation under the land use plan, which may include but are not limited to fuels treatment and habitat restoration. The subsequent NEPA analyses for project-specific actions would tier to the land-use planning analysis and would evaluate project impacts at the appropriate site-specific level (40 CFR, Part 1502.20, 40 CFR, Part 1508.28). As required by NEPA, the public would have the opportunity to participate in the NEPA process for site-specific actions.

The BLM reviewed all of the literature submitted by commenters for relevance. Some of the literature was already cited in the document, some literature was applicable to the Great Basin (any local references were used in the Proposed RMPA/Final EIS where appropriate), and some literature was not applicable (e.g., outside the scope of this document).

The BLM met with MFWP representatives regarding active lek information and determined that numbers, methodology, and rationale in the Draft EIS were appropriate. The BLM also incorporated information from the USFWS memo dated October 27, 2014, "Greater Sage-Grouse: Additional Recommendation to Refine Land Use Allocations in Highly Important Landscapes."

For stubble height requirements under the Proposed Plan Amendment, GRSG Habitat Objectives (see Section 2.6.2 of the Proposed RMPA/Final EIS) are to be used, at a minimum, to meet the applicable land health standard in GRSG habitats. As discussed in Section 3.6.1 of the Proposed RMPA/Final EIS, a high potential for cheatgrass occurrence does not exist within the planning area. Management actions in the No Action Alternative emphasize grazing to reduce cheatgrass. Section 3.14.2 of the Proposed RMPA/Final EIS describes assessments completed to assess achievement of land health standards and describes the process of permit renewal.

Section 3.19, Water Resources, of the Proposed RMPA/Final EIS describes the risk of spreading West Nile virus through developed water sources, such as dams and pits from mineral development. Section 4.18, Water Resources,

describes the potential risk of West Nile virus transmission to GRSG under the draft alternatives and the Proposed Plan Amendment.

Section 3.4.2, Conditions of the Planning Area, of the Proposed RMPA/ Final EIS, describes the human disturbances, including transmission lines, in the planning area that can have potential effects on GRSG. Section 3.5, Lands and Realty, in the Proposed RMPA/Final EIS, describes the existing land use authorizations, including transmission lines, in the planning area. Section 4.3.2, Nature and Type of Effects, of the Proposed RMPA/Final EIS, describes the impacts on GRSG from infrastructure, including transmission lines.

Section 4.3.2, Nature and Type of Effects, of the Proposed RMPA/Final EIS, describes the impacts on GRSG from noise, including energy development (e.g., oil and gas and solid minerals) and infrastructure (e.g., motorized vehicle use on roads or trails and wind energy development). The RDFs for mitigating noise impacts (see Appendices C and D in the Proposed RMPA/Final EIS) are based on the NTT report. See **Section O.2.3**, Greater Sage-Grouse—NTT Report/Findings, of this report for a discussion on how the NTT report was used in developing the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

Definitions of PH and GH in the planning area are provided in Section 3.4.1 of the Proposed RMPA/Final EIS. A description of the habitat mapping process is also presented in Section 3.4.1. In Montana, the BLM developed its PPH/PGH map based on data from MFWP. GRSG core areas are habitat associated with Montana's highest densities of GRSG (25 percent quartile), based on male counts, and GRSG lek complexes and associated habitat important to GRSG distribution. If minor changes to habitat delineations occur they would be dealt with through plan maintenance as required by NEPA. Major changes would require a plan amendment. The BLM Authorized Officer has the discretion to determine what minor and major changes are.

Regarding the Belt Mountain GRSG population, as stated in the Proposed RMPA/Final EIS (Section 3.4.2), only 0.1 percent of lands occupied by the Belt Mountain population are administered by the BLM; therefore, the BLM has limited authority to affect changes in management that may benefit this population. Additional text regarding BLM conservation activities that are planned for the Belt Mountain population has been provided for the cumulative effects analysis in the Proposed RMPA/Final EIS.

Impact Analysis

Summary

Commenters provided suggestions on how to improve or strengthen the impact analysis for GRSG in several areas, including:

- GRSG impact indicators

- Analysis of fences
- Impacts from livestock as compared to native ungulates
- Alternative A impacts analysis
- Roads associated with livestock grazing
- Vertical structures
- Consideration for impacts outside priority habitat and Areas of Critical Environmental Concern (ACEC)

Response

The Lewistown Field Office RMPA/EIS provides an adequate discussion of the environmental consequences, including the cumulative impacts, of the presented alternatives. As required by 40 CFR, Part 1502.16, the Proposed RMPA/Final EIS provides a discussion of the environmental impacts of the alternatives, including the proposed action, any adverse environmental effects that cannot be avoided should the alternatives be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented. The Proposed RMPA/Final EIS provides sufficiently detailed information to aid in determining whether to proceed with the preferred alternative or make a reasoned choice among the other alternatives in a manner such that the public could have an understanding of the environmental consequences associated with the alternatives, in accordance with 40 CFR, Part 1502.1.

Land use plan-level analyses are typically broad and qualitative rather than quantitative or focused on site-specific actions (BLM Land Use Planning Handbook H-1601-1, Chapter II, A-B at 11-13). The Lewistown Field Office RMPA/EIS contains only planning actions and does not include any implementation actions. A more quantified or detailed and specific analysis would be required only if the scope of the decision included implementation actions. As specific actions that may affect the area come under consideration, the BLM would conduct subsequent NEPA analyses that would include site-specific project and implementation-level actions. The site-specific analyses would tier to the plan-level analysis and expand the environmental analysis when more specific information is known. In addition, as required by NEPA, the public would be offered the opportunity to participate in the NEPA process for implementation actions.

The BLM reviewed the literature submitted for relevance; some of it was already cited in the document, some of it was applicable to the Great Basin and local references were used where appropriate, and some literature was not applicable (e.g., outside the scope of this document).

To clarify current measures in place to protect GRSG, language in Section 4.3.4 has been revised in the Proposed RMPA/Final EIS. It should be noted that BLM management actions are not the only factors impacting population trends under current conditions.

Regarding fence risks to GRSG, this represents an impact of grazing management on GRSG; information on general risk from fences is discussed in the Proposed RMPA/Final EIS under Section 4.3. Exact miles of BLM fences in relation to high collision risk areas is currently unknown; therefore, no quantitative information on collision risk is available.

Differences between impacts of native ungulates and livestock on GRSG are discussed in Section 4.3.2 of the Proposed RMPA/Final EIS.

The nature and type of impacts on GRSG from vertical structures is provided in Section 4.3.2 of the Proposed RMPA/Final EIS. Specific impacts of vertical structures under each alternative are provided in analysis of each alternative in Section 4.3. The nature and type of impacts from roads are provided in Section 4.3.2 of the Proposed RMPA/Final EIS. Specific impacts of roads under each alternative were provided in analysis of each alternative in Section 4.3 of the Proposed RMPA/Final EIS.

The Belt Mountains population is the only population within the planning area that only contains PGH. The Proposed RMPA/Final EIS (Section 4.3) discloses impacts from each alternative on the Belt Mountains population. Impacts to habitat outside GRSG ACECs is provided under Alternatives A, B, and D, and the Proposed Plan Amendment, in the Proposed RMPA/Final EIS. Alternative C is the only alternative that has a GRSG ACEC.

Cumulative Impact Analysis

Summary

The BLM has not fully considered cumulative impacts on GRSG, particularly actions on adjacent lands. The BLM should include the Montana Greater Sage-Grouse Habitat Conservation Strategy in the cumulative effects section.

Response

The BLM analyzed cumulative effects on GRSG in the Draft RMPA/EIS in Section 5.2 and revised this analysis in Section 5.3 of the Proposed RMPA/Final EIS. The Draft RMPA/EIS considered the present effects of past actions, to the extent that they are relevant, and present and reasonably foreseeable (not highly speculative) federal and non-federal actions, taking into account the relationship between the proposed alternatives and these reasonably foreseeable actions. This discussion summarizes CEQ guidance from June 24, 2005, stating that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." This is because a description of the

current state of the environment inherently includes the effects of past actions. Information on the current conditions is more comprehensive and more accurate for establishing a useful starting point for cumulative effects analysis. The CEQ interpretation was accepted by the Ninth in *NW Envtl. Advoc. v. Nat'l Marine Fisheries Serv.*, 460 F.3d 1125, 1141 (9th Cir. 2006). The BLM described their assumptions regarding proposed projects and other reasonably foreseeable future actions. The BLM has complied fully with the requirements of 40 CFR, Part 1508.7 and prepared a cumulative impact analysis to the extent possible based on the broad nature and scope of the proposed management options under consideration at the land use planning level.

Section 5.2.2 of the Proposed RMPA/Final EIS provides a discussion of the past, present, and reasonably foreseeable future actions that comprise the cumulative impact scenario (see Table 1-1). Section 5.3.8 includes a summary of management zone-wide reasonably foreseeable future actions used in the analysis of cumulative impacts on GRSG (see Section 5.3 in the Proposed RMPA/Final EIS). 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 plan or because so little is known about the potential action that formulating an analysis of impacts is premature and/or speculative. 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.

The Draft RMPA/EIS contained a qualitative discussion of cumulative effects at the WAFWA MZ scale to set the stage for a more quantitative analysis that is contained in the Proposed RMPA/Final EIS. The MZ cumulative effects analysis has been revised for the Final EIS in Chapter 5. Additional quantitative cumulative analysis was added to the Final EIS in Section 5.3, Greater Sage-Grouse.

Regarding the Belt Mountains GRSG population, as stated in the Proposed RMPA/Final EIS (Section 3.4.2) only 0.1 percent of lands occupied by the Belt Mountains population are administered by the BLM; therefore, the BLM has limited authority to affect changes in management that may benefit this population.

The Governor of the State of Montana issued Executive Order 10-2014, which created the MSGOT and the Montana Sage Grouse Habitat Conservation Program. The executive order outlines a number of conservation strategies for state agencies to follow for land uses and activities in GRSG habitat in addition to establishing the MSGOT and habitat conservation program. The state conservation efforts are complementary to the conservation measures proposed in the BLM land use plans and when combined would provide conservation efforts across land ownership boundaries. Montana Executive Order 10-2014 is considered in the GRSG cumulative effects analysis in Section 5.3 of the Final EIS.

Mitigation Measures

Summary

Commenters provided recommendations to strengthen or clarify mitigation measures. The BLM should provide more details on their adaptive management strategy, monitoring, fire and invasive species management, and mitigation, including compensatory mitigation.

Response

The BLM has updated the Proposed RMPA/Final EIS with additional information for the draft mitigation, monitoring, and adaptive management strategies that were included in the Draft RMPA/EIS as discussed in the response to **Section O.2.1**, NEPA, of this report. Section 2.7.1 of the Proposed RMPA/Final EIS provides the BLM's adaptive management strategy for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. Section 2.7.2 and Appendix B provide the BLM's finalized monitoring framework. Section 2.7.3 and Appendix G provide the BLM's finalized regional mitigation strategy. Appendix K in the Proposed RMPA/Final EIS includes requirements that landscape scale fire and invasives assessments be completed and updated regularly to more accurately define specific areas to be treated to address threats to sagebrush steppe habitat.

The BLM complied with NEPA by including a discussion of measures that may mitigate adverse environmental impacts of the alternatives in the Lewistown Field Office RMPA/EIS. See 40 CFR, Part 1502.14(f), 1502.16(h). Potential forms of mitigation include: 1) avoiding the impact altogether by not taking a certain action or parts of an action; 2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; 3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and 5) compensating for the impact by replacing or providing substitute resources or environments (40 CFR, Part 1508.20). Taking certain actions, such as sagebrush restoration, are only one of many potential forms of mitigation. The BLM must include mitigation measures in an EIS pursuant to the NEPA, yet the BLM has full discretion in selecting which

mitigation measures are most appropriate, including which forms of mitigation are inappropriate. In undertaking BLM management actions and in authorizing third-party actions that result in habitat loss and degradation, the BLM would, consistent with valid existing rights and applicable law, require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. This would be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.

The BLM would conduct subsequent project-specific NEPA analyses for projects proposed for implementation under the land use plan. The subsequent NEPA analyses for project-specific actions would tier to the land-use planning analysis and would evaluate project impacts at the appropriate site-specific level (40 CFR, Part 1502.20, 40 CFR, Part 1508.28). RDFs would be identified during this process and applied to environmental assessment (EA)/EIS documents authorizing the activity on BLM-administered lands. As required by NEPA, the public would have the opportunity to participate in the NEPA process for site-specific actions.

O.2.4 Areas of Critical Environmental Concern

Range of Alternatives

Summary
Commenters stated that the proposed GRSG ACEC does not meet the relevance and importance criteria required of an ACEC under 43 CFR, Part 1610.7.2.

Response
The process for determining whether a nominated ACEC meets the relevance and importance criteria is detailed in Appendix E of the Proposed RMPA/Final EIS.

According to BLM Manual 1613, Areas of Critical Environmental Concern, an area must meet at least one relevance and one importance criterion to be considered as a potential ACEC and analyzed in resource management plan alternatives (see BLM Manual 1613.11, Identification Criteria). Through the evaluation process, the BLM determined that the nominated ACEC for GRSG met relevance criteria for a fish and wildlife resource and a natural process or system. The nominated GRSG ACEC also met the importance criteria because it warrants national priority/FLPMA protection (see Appendix E in the Proposed RMPA/Final EIS). The rationale for meeting the relevance and importance criteria are found in Appendix E.

BLM Manual 1613 directs that, "All areas which meet the relevance and importance criteria must be identified as potential ACECs and fully considered for designation and management in resource management planning" (see BLM

Manual 1613.21, Identifying Potential ACECs). Based on this direction, the BLM considered designation of the potential GRSG ACEC under Alternative C and identified special management attention for the area.

O.2.5 Climate Change

Impact Analysis

Summary

Commenters requested that the Final EIS include an analysis of the effects of climate change on the potential for cheatgrass and other invasive plants to spread in the future and affect GRSG habitat, as well as evaluate the contribution of livestock grazing on greenhouse gas emissions and the impacts of livestock grazing in conjunction with climate change on vegetation communities (as described in Beschta et al. 2012).

Response

Text stating that climate change has the potential to produce warmer and drier conditions that may increase the potential for the spread of cheatgrass and other invasive plants over current conditions has been added to Sections 3.6.3 and 3.17.3 of the Proposed RMPA/Final EIS. As described in the Proposed RMPA/Final EIS, 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 Plan Amendment, vegetation management and restoration would prioritize sagebrush re-establishment and weed control as part of habitat management. In addition, an adaptive management strategy has been incorporated in Section 2.7.1 of the Proposed RMPA/Final EIS and further outlines how the BLM would monitor changing vegetative conditions under the Proposed Plan Amendment, including changes that may result from drought and from climate change.

The reference cited, Beschta et al. 2012, reports that domestic livestock and other ungulates alter vegetation, soils, hydrology, and wildlife species composition and abundances that exacerbate the effects of climate change on western landscapes, and that removing or reducing livestock grazing across large areas of public land would alleviate a widely recognized and long-term stressor and make ecosystems less susceptible to the effects of climate change. Assessing the impacts of grazing on vegetative resilience on public lands in light of climate change is outside the scope of this document, except as it pertains to reducing impacts on GRSG and GRSG habitat within the Lewistown Field Office planning area, and in consideration of valid existing rights and the BLM's multiple-use mandate under FLPMA. The Lewistown Field Office Greater Sage-Grouse RMPA/Final EIS evaluates alternatives that would incorporate GRSG habitat objectives into BLM grazing allotments and permit renewals (Alternatives B and D and the Proposed Plan Amendment) and that would remove livestock grazing from all allotments in PHMA and GHMA (Alternative C), and the associated

effects these alternatives would have on GRSG and GRSG habitat (see Sections 4.3.4 through 4.3.8).

In addition, Table 4-3, Climate Change subsection, of the Proposed RMPA/Final EIS states, "[t]here is no specific resource program in this RMPA for addressing this threat [climate change] to GRSG and its habitat. However, actions under several resources listed below do address climate change and drought impacts on GRSG habitat." These actions include efforts to manage public rangelands under drought conditions.

O.2.6 Cultural and Heritage Resources

Impact Analysis

Summary
Commenters stated that the BLM must consider the impacts of livestock grazing on cultural and historic resources.

Response
While cultural and historic resources may be impacted by on-going livestock grazing activities, the BLM determined that management actions in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS would not directly impact cultural and historic resources (Section 3.3 of the Proposed RMPA/Final EIS). Implementation of any of the alternatives would result in general and unquantifiable indirect beneficial effects for cultural and historic resources in terms of greater protection through new restrictions on surface and resource use resulting in reduced opportunities for surface disturbance or habitat disruption where they exist. For further information on the environmental consequences on cultural and historic resources from livestock grazing, please refer to the Environmental Consequence sections of the Judith Resource Area Resource Management Plan and the Headwaters Resource Management Plan being amended by this Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

O.2.7 Fire and Fuels

Range of Alternatives

Summary
Commenters requested the following alternative modifications: no prescribed burning be allowed in PH and GH, or if allowed, that it should only be allowed on a case-by-case basis if it can be shown that impacts are neutral or beneficial to GRSG; treatment of sagebrush habitat be a last alternative for fuels management; and that the Final EIS explain why prescribed burning in GRSG habitat is included in the preferred alternative if it is not currently practiced.

Commenters also stated that appropriate grazing should be recognized in the RMPA as a primary tool in the prevention of wildfire and reduction of invasive weeds—two of the primary threats to GRSG habitat.

Response
Section 1.5 of the Proposed RMPA/Final EIS describes how the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process to develop a reasonable range of alternatives for the RMPA. The BLM complied with NEPA and the CEQ implementing regulations at 40 CFR, Part 1500 in the development of alternatives for the Draft RMPA/EIS, including seeking public input and analyzing reasonable alternatives (see also **Section O.2.1**, NEPA—Range of Alternatives, of this report).

The Proposed Plan Amendment would allow management actions, including prescribed fire, to occur where they are most beneficial to GRSG as detailed in site-specific analysis. If site-specific NEPA analysis shows that a prescribed burn would benefit GRSG, then a plan amendment would not be required to allow the project.

Grazing is just one of the tools available in the prevention of wildfire and reduction of invasive weeds. As described in Section 4.5.2 of the Proposed RMPA/Final EIS, livestock grazing may have both beneficial and detrimental aspects, depending on site-specific management (Connelly et al. 2004). At unsustainable levels, grazing can lead to loss of vegetative cover, decreased plant litter, increased soil erosion, and reduced habitat quality for wildlife, including GRSG (Knick 2011; Connelly et al. 2004). Properly managed grazing can be used as a tool to reduce fuel load, to protect intact sagebrush habitat, and to increase habitat extent and continuity (Adams et al. 2004). Grazing can also have beneficial effects on vegetation, by reducing litter removing annual grasses, facilitating growth of native species and increasing vegetation community diversity. Section 4.6.2 of the Proposed RMPA/Final EIS also states, "Grazing management can impact the ability to manage fire as a natural process through changes in fine fuels availability (e.g., grasses). Livestock grazing reduces fuel loads; the voluntarily relinquishment of grazing allotments and allocation of those lands to other uses may lead to increased fuels in site-specific locations. Conversely, increasing AUMs could reduce fuel loads." The effect of grazing on wildland fire risk for each alternative was included in Sections 4.6.6 through 4.6.9 of the Proposed RMPA/Final EIS.

Mitigation Measures

Summary
Commenters requested that mitigation and monitoring for post-fire management be clearly listed and discussed in the Final EIS.

Response
The BLM has developed a Greater Sage-Grouse Monitoring Framework that is included in the Proposed RMPA/Final EIS as Appendix B. The appendix describes the process that the BLM would use to monitor implementation and effectiveness of RMP decisions, including post fire-management. The monitoring framework includes monitoring at various scales specific to GRSG habitat, consistent indicators to measure and metric descriptions for each of the scales, analysis and reporting methods, and the incorporation of monitoring results into adaptive management. The need for fine- and site-scale-specific habitat monitoring would vary by area depending on existing conditions, habitat variability, threats, and land health. To accomplish effectiveness monitoring, the BLM would analyze the monitoring data to characterize the relationship among disturbance, implementation actions, and habitat condition at the appropriate and applicable geographic scale or boundary. When available from WAFWA and/or state wildlife agencies, effectiveness monitoring can be supplemented with population trend information, taking into consideration the lag effect response of populations to habitat changes. See also response for **Section O.2.1**, NEPA—Mitigation Measures, in this appendix for additional information on the mitigation approach.

The RDFs for fire and fuels management are provided in Appendices C and D of the Proposed RMPA/Final EIS. The RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts for fuels management and fire operations.

O.2.8 Fish and Wildlife

Range of Alternatives

Summary
The BLM should provide additional references to support the impact conclusions for other special status species.

Response
As described in **Section O.2.1**, NEPA—Best Available Data, the best available information pertinent to the decisions to be made was used in developing the Lewistown RMPA/EIS. The BLM made considerable effort to acquire and convert resource data from the BLM and from outside sources, into digital format for use in the RMPA/EIS.

The BLM reviewed the literature submitted by commenters for relevance. Some of the literature was already cited in the document, some literature was applicable to the Great Basin (any local references were used in the Final EIS where appropriate), and some literature was not applicable (e.g., outside the scope of this document).

O.2.9 Lands and Realty

Range of Alternatives

Summary
Commenters requested BLM consider suggested management actions, including changing PH in Alternative D from ROW avoidance areas to ROW exclusion areas for oil and gas development, power lines, and wind energy development. In addition, the Final EIS should reference the USFWS 2012 Land-based Wind Energy Guidelines where such development may ultimately be considered in ROW avoidance or other areas.

Response
The BLM complied with NEPA and the CEQ implementing regulations at 40 CFR, Part 1500 in the development of alternatives for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS, including seeking public input and analyzing reasonable alternatives (see also response to **Section O.2.1**, NEPA—Range of Alternatives, in this report). Additional site-specific impacts analysis and application of necessary mitigation measures as determined appropriate would be required prior to approval of ROW permits in avoidance areas.

The Proposed Plan Amendment in the Final EIS makes PHMA exclusion areas for solar and wind developments and avoidance areas for high-voltage transmission lines and large pipeline ROWs and minor ROWs. GHMA are avoidance areas for solar, wind, and high-voltage transmission lines and large pipeline ROWs, and open for minor ROWs.

Best Available Information Baseline Data

Summary
The Final EIS should explain the rationale for determining ROW avoidance and exclusion areas, and how avoidance would be implemented. The Draft EIS failed to include information on wind farms on non-BLM-administered lands in the planning area and did not adequately represent the potential for wind farms to be developed given the high wind potential of 42,000 acres.

Response
ROW avoidance and exclusion area determination and implementation are described in response for **Section O.2.9**, Lands and Realty—Range of Alternatives, of this report, and text has been updated in the Final EIS in Section 2.6.2 to clarify.

The BLM used the most recent and best information available that was relevant to a land use planning-level analysis, and the BLM consulted with, collected, and incorporated data from other agencies and sources. Information has been added to Section 3.22.1 in the Proposed RMPA/Final EIS to further describe active

wind energy developments in and adjacent to the planning area. Section 3.22.3 in the Proposed RMPA/Final EIS describes the trends in wind energy development.

Impact Analysis

Summary
Given the infrastructure and miles of road and power lines already authorized, commenters requested clarification from BLM for how the continued alteration of habitat would maintain or improve conditions for GRSG.

Response
The analysis in the Proposed RMPA/Final EIS focuses on the direct, indirect, and cumulative impacts that could potentially result from on-the-ground changes. This analysis identifies impacts that may result in some level of change to the resources, regardless of whether that change is beneficial or adverse. The requisite level of information necessary to provide an adequate discussion of the environmental consequences, including the cumulative impacts, of the presented alternatives is to provide the public and the decision maker with the environmental impacts of the alternatives, including the proposed action, any adverse environmental effects that cannot be avoided should the alternatives be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented (40 CFR, Part 1502.16). The cumulative impacts associated with past, present, and reasonably foreseeable actions, including roads and power lines, on GRSG and GRSG habitat are described in Section 5.3 of the Proposed RMPA/Final EIS. Cumulative effects analysis in Section 5.3 was revised in the Proposed RMPA/Final EIS to include a cumulative effects analysis on GRSG at the WAFWA MZ level. The cumulative effects analysis on GRSG includes the analysis of reasonably foreseeable future actions (see Table 5-11 in Chapter 5 of the Proposed RMPA/Final EIS).

O.2.10 Leasable Minerals

Range of Alternatives

Summary
The BLM needs to consider additional actions or clarifications to existing actions within the range of alternatives, including RDFs, BMPs, and well pad density. Also, commenters requested clarification on the life span of the existing protest resolution decision that does not allow oil and gas leasing of nominated parcels that would require a special stipulation that would protect important wildlife values.

Response
The BLM complied with NEPA and the CEQ implementing regulations at 40 CFR, Part 1500 in the development of alternatives for the Lewistown Field

Office RMPA/EIS, including seeking public input and analyzing reasonable alternatives (see also response to **Section O.2.1**, NEPA—Range of Alternatives, in this report). Also as previously noted, the relative emphasis given to particular resources and resource uses differs as well, including allowable uses, restoration measures, and specific direction pertaining to individual resource programs. When resources or resource uses are mandated by law or are not tied to planning issues, there are typically few or no distinctions between alternatives. Meaningful differences among the draft alternatives and Proposed Plan Amendment are described in Table 2-3 of the Proposed RMPA/Final EIS.

Suggested revisions have been reviewed and incorporated as appropriate to clarify alternatives (see Chapter 2 of the Proposed RMPA/Final EIS). Changes implemented in the Proposed RMPA/Final EIS include the addition of SFAs, guidance for incorporating GRSG RMP decisions into grazing authorizations, vegetation objectives guidance, density and disturbance caps, mitigation guidance, and guidance for applying lek buffers when approving actions (see the description of Changes from Draft RMPA to the Proposed RMPA in Section 1.9 of the Proposed RMPA/Final EIS).

As discussed in Sections 1.3 and 1.6.4 in the Proposed RMPA/Final EIS, there is an existing protest resolution decision affecting lands managed within the Lewistown Field Office that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PPH and PGH, or PHMA and GHMA. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, this RMPA/EIS would not satisfy the requirements of the protest stipulation. The Lewistown Field Office RMP revision process, which began in 2013, will address oil and gas leasing for the entire Lewistown Field Office planning area boundary. The revision process is scheduled to be completed in 2017.

Impact Analysis

Summary

The Draft RMPA/EIS failed to clarify how RDFs would be applied to valid existing rights.

Response

As stated in Section 1.7 of the Proposed RMPA/Final EIS, the RMPA would recognize valid existing rights. Valid existing rights would be honored, which include any leases, claims, or other authorizations established before a new or

modified authorization, change in land designation, or new or modified regulation is approved.

When an oil and gas lease is issued, it constitutes a valid existing right; the BLM cannot unilaterally change the terms and conditions of the lease or place additional stipulations on a lease. Existing leases would not be terminated until the lease expires. However, based on site- or project-specific environmental analysis, RDFs could be applied as COAs at the application for permit to drill (APD) and Sundry Notice stage and at subsequent development stages to mitigate potential impacts from oil and gas operations within existing lease areas, providing the leaseholder's right to develop the lease remains intact (Section 2.6.2 of the Proposed RMPA/Final EIS). Where a proposed fluid mineral development project on an existing lease could adversely affect GRSG populations or habitat, the BLM will work with the lessees, operators, or other project proponents to avoid, reduce, and mitigate adverse impacts to the extent compatible with lessees' rights to drill and produce fluid mineral resources. The BLM will work with the lessee, operator, or project proponent in developing an APD for the lease to avoid and minimize impacts on GRSG or its habitat and will ensure that the best information about the GRSG and its habitat informs and helps to guide development of such federal leases.

Mitigation Measures

Summary
Commenters requested that mitigation for prospecting permits for nonenergy leasable mineral development be described or defined.

Response
Appendix C and Appendix D of the Proposed RMPA/Final EIS contain RDFs designed to protect GRSG habitat that could be applied to nonenergy leasables. The use and application of specific RDFs would be made during the environmental analysis process for individual proposals on a case-by-case basis. See the response in **Section O.2.1**, NEPA—Mitigation Measures, in this report for more details on mitigation measures proposed.

O.2.11 Livestock Grazing

Summary
Commenters stated that the Draft RMPA/EIS is contrary to the Taylor Grazing Act (TGA) because proposed permit termination would violate the TGA and FLPMA mandate that forage resources on grazing districts are to be made available for livestock grazing. Commenters also stated the BLM should conduct an assessment to determine if lands in the project area are still "chiefly valuable" for grazing.

Response
FLPMA grants the Interior Secretary the authority to make land use planning decisions, taking into consideration multiple use and sustained yield, ACECs, present and potential uses of the land, relative scarcity of values, and long-term and short-term benefits, among other resource values (43 US Code (USC) 1711 Sec 201 (a)). 43 CFR, Part 4100.0-8 provides that the BLM shall manage livestock grazing on public lands in accordance with applicable land use plans. Further, the BLM may designate lands as "available" or "unavailable" for livestock grazing through the land use planning process (H-1601, Land Use Planning Handbook, Appendix C).

The TGA requires that the Secretary "make such rules and regulations … [and] do any and all things necessary … to insure the objects of … grazing districts, namely, to regulate their occupancy and use, to preserve the land and its resources from destruction or unnecessary injury [and] to provide for the orderly use, improvement and development of the range" (43 USC 315a).

A "chiefly-valuable-for-grazing" determination made under the TGA is required only when the Secretary is considering creating or changing grazing district boundaries. Such a determination is neither required nor appropriate when establishing grazing levels within a district (see US Department of the Interior, Solicitor Memorandum Clarification of M-37008 [May 13, 2003]). This RMPA is not considering creating or changing grazing district boundaries. Although lands have been identified as "chiefly-valuable-for-grazing" per the TGA for purposes of establishing grazing districts within the public domain (see 43 USC 315), this does not negate the BLM's authority or responsibility to manage those lands to achieve resource condition goals and objectives under the principals of multiple use and sustained yield as required by FLPMA and its implementing regulations.

The Lewistown Field Office Greater Sage-Grouse RMPA/EIS is a targeted amendment specifically addressing goals, objectives, and conservation measures to conserve GRSG and to respond to the potential of it being listed (see Section 1.2 of the Proposed RMPA/Final EIS). The Lewistown Field Office RMPA/EIS included alternatives that provide a greater and lesser degree of restrictions in various use programs, but would not eliminate or invalidate any valid existing rights.

Range of Alternatives

Summary
Many commenters noted an apparent contradiction in the Draft RMPA/EIS, focused on the question of whether grazing in the Lewistown Field Office has an adverse effect on GRSG and habitat. Chapter 5 states that grazing does not constitute a substantial threat to GRSG because there are ongoing management actions in Lewistown Field Office intended to preserve GRSG habitat; however Alternatives B and D include further constraints on grazing, and Alternative C

closes all habitat to grazing entirely. Commenters also requested more evidence from BLM supporting the assertion that grazing does, or does not, damage GRSG or GRSG habitat. More specific comments included prioritizing habitat assessments and fence removals; the suggestion that grazing restrictions be limited to timing or intensity rather than reductions in AUMs; and several citations in support of the assertion that leaving grazing areas fallow in the long term results in re-establishment of native forbs and grasses.

Response

The BLM considered a reasonable range of alternatives during the GRSG planning process in full compliance with NEPA (see response in **Section O.2.1**, NEPA—Range of Alternatives, for details of the development of the range of alternatives).

Livestock grazing was identified by USFWS as a threat to GRSG in the March 23, 2010, Federal Register notice; therefore, it is addressed in this RMPA. Existing regulatory mechanisms, including the fundamentals for rangeland health, would continue to provide the basis for managing grazing in GRSG habitat.

Alternatives B and D and the Proposed Plan Amendment are not intended to eliminate grazing in the planning area altogether, but to provide District Managers the tools to further preserve GRSG habitat if it is determined that the current strategies are not sufficient. Habitat objectives would be incorporated into standards and guidelines for rangeland health under Alternatives B, C, and D and the Proposed Plan Amendment. Standards and guidelines would be based on the most current science (including Connelly and Hagen's GRSG habitat standards), would be tailored to local conditions, and would be used to assess rangeland health of allotments prior to granting or renewing grazing permits. A toolbox of permit conditions and conservation measures such as RDFs (Appendix C and Appendix D of the Proposed RMPA/Final EIS) would be available to District Managers to choose from when granting or renewing grazing permits, as applicable for each individual allotment within PHMA. Blanket, one-size-fits-all standards and objectives would not be imposed on permittees under the amended RMPs. The Proposed RMPA/Final EIS also includes additional guidance as to how the BLM will incorporate GRSG decisions from the amendment into grazing permits and leases.

Land use plan-level analyses are typically broad and qualitative rather than quantitative or focused on site-specific actions (BLM Land Use Planning Handbook H-1601-1, Chapter II, A-B at 11-13 and Chapter IV, B at 29). The BLM would conduct subsequent project-specific NEPA analyses for projects proposed for implementation under the land use plan, which may include, but are not limited to, fuels treatment and habitat restoration. The subsequent NEPA analyses for project-specific actions would tier to the land-use planning analysis and would evaluate project impacts at the appropriate site-specific level (40 CFR, Part 1502.20, 40 CFR, Part 1508.28). As required by NEPA, the public

would have the opportunity to participate in the NEPA process for site-specific actions.

In accordance with IM 2012-169 and BLM's Land Use Planning Handbook, the BLM considered what range of alternatives was necessary for livestock grazing to address unresolved conflicts among available resources. The WO IM states that BLM should analyze either a reduced or no-grazing alternative. The BLM chose to analyze no grazing alternative, instead of a reduced grazing alternative. The no grazing alternative was analyzed because of the number of allotments in the planning area not meeting land health standards. Also, because of the intermingled land pattern, the BLM would need to install fencing where allotments are adjacent to non-BLM-administered lands for either a no grazing alternative or a reduced grazing alternative. The alternative submitted by the conservation groups was revised to meet the needs of the Lewistown Field Office RMPA/EIS; therefore, all their suggestions were not included verbatim in Alternative C.

The Proposed RMPA/Final EIS acknowledges that grazing is just one of the tools available in the treatment of vegetation. As described in Section 4.5.2 of the Proposed RMPA/Final EIS, livestock grazing may have both beneficial and detrimental aspects, depending on site-specific management (Connelly et al. 2004). At unsustainable levels, grazing can lead to loss of vegetative cover, decreased plant litter, increased soil erosion, and reduced habitat quality for wildlife, including GRSG (Knick 2011; Connelly et al. 2004). Properly managed grazing can be used as a tool to reduce fuel load, to protect intact sagebrush habitat, and to increase habitat extent and continuity (Adams et al. 2004). Grazing can also have beneficial effects on vegetation, by reducing litter removing annual grasses, facilitating growth of native species and increasing vegetation community diversity.

Removal and marking of specific fences is an implementation-level action and is not addressed in the Final EIS. However, fences within PHMA and GHMA are currently being evaluated, mapped, and marked with the priority on fences with high and moderate collision risks as determined by using the National Resource Conservation Service (NRCS)-developed Fence Collision Risk Tool GIS application. These efforts have been incorporated into the cumulative effects analysis found in Chapter 5 of the Proposed RMPA/Final EIS.

Under the Proposed Plan Amendment, at the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM would consider whether the public lands where that permitted use was authorized should remain available for livestock grazing or be used for other resource management objectives, such as reserve common allotments. A reserve common allotment is an area which is designated in the land use plan as available for livestock grazing but reserved as an area available for use as an alternative to grazing in another allotment in order to facilitate rangeland restoration treatments and recovery from natural

disturbances such as drought or wildfire. The reserve common allotment would provide needed flexibility that would help the agency apply temporary rest from grazing where vegetation treatments and/or management would be most effective.

Best Available Information Baseline Data

Summary
Multiple commenters requested that the Draft RMPA/EIS be amended to include allotment-level rangeland health data, allotment-level analyses of standards and guidelines implementation, and detailed descriptions of current grazing and habitat conditions in the planning area. Multiple commenters asserted that appropriately managed grazing is beneficial to GRSG and GRSG habitat.

Response
As noted in the response to **Section O.2.1**, NEPA—Best Available Data, of this report, a land use planning-level decision is broad in scope and, therefore, does not require an exhaustive gathering and monitoring of baseline data.

All grazing allotments within the planning area, including those in GRSG habitat, that were determined to not be meeting land health standards due to livestock grazing have had management changes implemented, as demonstrated in Table 3-46 and discussed in Section 3.14.2 of the Proposed RMPA/Final EIS. Previously completed site-specific EAs to renew grazing authorizations are discussed Section 3.14.2 of the Proposed RMPA/Final EIS. Watershed areas in PHMA that contain expired or expiring grazing authorizations would be prioritized for renewal. Section 3.14.2 of the Proposed RMPA/Final EIS lists the order for grazing permit renewals.

The Proposed RMPA/Final EIS (Section 3.14.2) has been updated to include additional information on existing site-specific EAs and corresponding land health determinations for clarity.

The BLM reviewed the literature submitted by commenters for relevance. Some of the literature was already cited in the document, some literature was applicable to the Great Basin (any local references were used in the Proposed RMPA/Final EIS where appropriate), and some literature was not applicable (e.g., outside the scope of this document).

Impact Analysis

Summary
Commenters suggested the Draft RMPA/EIS be amended to include more detailed analysis on the following issues: grazing as a surface-disturbing activity; and the difficulty of setting guidelines when grazing utilization is averaged across pastures, species, and seasons.

Response
These types of impacts would occur from implementing grazing permit renewals. As discussed in detail in the response to **Section O.2.3**, Greater Sage-Grouse—Impact Analysis, the Lewistown Field Office RMPA/EIS contains only planning actions and does not include any implementation actions. A more quantified or detailed and specific analysis would be required only if the scope of the decision included implementation actions.

Mitigation Measures

Summary
Commenters suggested that the relative success of standards and guidelines established to protect GRSG habitat be assessed more frequently than at ten-year intervals. Also, commenters suggested that the Draft RMPA/EIS be revised to draw a clear connection between studies identifying healthy GRSG habitat and the standards and guidelines intended to achieve such habitat.

Response
Funding and scheduling of field office-level assessment efforts is outside the scope of this planning-level NEPA process. Habitat assessments may be conducted on a schedule determined by the Field Office Manager, depending on resource availability, and could include evaluations more frequently than once every ten years. However the imposition of new or modified standards and guidelines would necessarily be tied to grazing permit renewals, which come only at ten-year intervals, and thus assessing the success of the conditions more frequently than that would not add much value.

Habitat objectives would be incorporated into standards and guidelines for rangeland health under Alternatives B, C, and D and the Proposed Plan Amendment. Whether or not standards are being met will be determined prior to renewing grazing authorizations. A toolbox of permit conditions and conservation measures would be available to managers to choose from when granting or renewing grazing authorizations, as applicable for each individual allotment within PHMA.

O.2.12 Locatable Minerals

Range of Alternatives

Summary
The BLM needs to consider additional withdrawals from mineral entry in order to protect GRSG.

Response
Section 1.5 of the Proposed RMPA/Final EIS describes how the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process to develop a reasonable range of alternatives for the RMPA.

See response under **Section O.2.1**, NEPA—Range of Alternatives. Withdrawals of PHMA and GHMA have been considered within the range of alternatives; as shown in Table 2-3 in the Proposed RMPA/Final EIS, there are 2,538 acres of existing withdrawal within the planning area. A total of 279,097 acres and 453,969 acres of withdrawal are analyzed under Alternatives B and C, respectively. The Proposed RMPA/Final EIS includes SFAs that would be recommended for withdrawal from the General Mining Act of 1872, subject to valid existing rights. Mining claim validity examinations would not be initiated in areas not withdrawn and/or without proposed exploration or development.

Mitigation Measures

Summary

Commenters stated that additional mitigation, including BMPs for locatable mineral development should be required, not recommended (e.g., applied as RDFs) in compliance with RMPA GRSG goals and objectives and compensatory mitigation.

Response

Locatable minerals are minerals for which the right to explore or develop the mineral resource on federal land is established by the location (or staking) of mining claims and is authorized under the General Mining Law of 1872. The BLM can only apply mitigation measures to prevent unnecessary or undue degradation, which means conditions, activities, or practices that (43 CFR, Part 3809.5): 1) fail to comply with one or more of the following: the performance standards in Section 3809.420, the terms and conditions of an approved Plan of Operations, operations described in a complete notice, and other federal and state laws related to environmental protection and protection of cultural resources; 2) are not "reasonably incident" to prospecting, mining, or processing operations as defined in Section 3715. 0-5 of this chapter; or 3) fail to attain a stated level of protection or reclamation required by specific laws in areas such as the California Desert Conservation Area, Wild and Scenic Rivers, BLM-administered portions of the National Wilderness System, and BLM-administered National Monuments and National Conservation Areas.

A Plan of Operations is not a BLM plan; rather it is submitted by the project applicant wanting to develop the minerals. Appendix C and Appendix D of the Proposed RMPA/Final EIS contain RDFs that could be applied to locatable minerals to the extent consistent with applicable law. The RDFs are designed to protect GRSG habitat. Before Plans of Operations are approved, a project-specific environmental review document would be prepared to assess impacts. RDFs would be applied as COAs or mitigation measures to the authorizing document as determined by site specific project level NEPA analysis as to prevent undue and unnecessary environmental degradation.

Mitigation has been further defined as a Regional Mitigation Strategy and is detailed in Appendix G of the Proposed RMPA/Final EIS. The strategy is incorporated in the Proposed RMPA/Final EIS and was developed to achieve a net conservation gain to the species by implementing conservation actions. Regional mitigation is a landscape-scale approach to mitigating impacts to resources. This involves anticipating future mitigation needs and strategically identifying mitigation sites and measures that can help achieve the greatest conservation benefit for GRSG and its habitats.

If impacts on GRSG or its habitat from authorized land uses remain after applying avoidance and minimization measures, then compensatory mitigation projects would be used to fully offset impacts to achieve conservation benefits. Any compensatory mitigation would be durable, timely, and in addition to that which would have resulted without the compensatory mitigation.

Specific mitigation strategies, based on the strategy in Appendix G of the Proposed RMPA/Final EIS, will be developed by regional teams within one year of the issuance of the ROD and be consistent with the BLM's Regional Mitigation Manual MS-1794 and CEQ regulations at 40 CFR, Part 1508.20.

O.2.13 Recreation

Range of Alternatives

Summary
The BLM needs to consider additional actions or clarifications to existing actions within the range of alternatives, including expanding protections or buffers beyond GRSG habitat.

Response
As discussed in the response to **Section O.2.1**, NEPA—Range of Alternatives, the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process to develop a reasonable range of alternatives for the RMPA. Meaningful differences among the draft alternatives and Proposed Plan Amendment are described in Table 2-3 of the Proposed RMPA/Final EIS. In terms of recreation, Alternative B is similar to Alternative D and the Proposed Plan Amendment since they would only allow neutral/beneficial special recreation permits (SRPs) in PHMA.

During the development of the Final EIS, the BLM met with the USFWS to determine changes to the management actions and mitigation measures. The outcome from these meetings resulted in noted clarifications and edits to the alternatives (see Section 2.6.2 of the Proposed RMPA/Final EIS). In undertaking BLM management actions in PHMA and GHMA, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM would apply the lek buffer-distances identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review (Open File

Report 2014-1239) in accordance with Appendix M of the Proposed RMPA/Final EIS.

O.2.14 Salable Minerals

Range of Alternatives

Summary

Commenters requested clarifications in the Final EIS, including defining "public interest" when referring to "where disposal is deemed to be in the public interest" and if RDFs will be required for existing salable mineral operations. Commenters also requested that PH/GH be considered as such "key wildlife areas" in the selected alternative.

Response

As discussed in the response to **Section O.2.1**, NEPA—Range of Alternatives, of this report, the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process to develop a reasonable range of alternatives for the RMPA. Meaningful differences among the draft alternatives and Proposed Plan Amendment are described in Table 2-3 of the Proposed RMPA/Final EIS.

With a generally public-initiated program like mineral materials, "public interest" would include a wide variety of demand, needs, resource availability, and potential impacts that would be determined and analyzed at a site-specific level.

As discussed in the Proposed RMPA/Final EIS under Alternatives B, C, and D and the Proposed Plan Amendment, if an area is open to salable minerals, mineral material sales or permits are analyzed on a case-by-case basis with site-specific NEPA. Based on this analysis, the field manager would issue sales or permits with RDFs or deny the proposal if impacts cannot be mitigated.

"Key wildlife areas" would apply to GRSG habitat, including both PHMA and GHMA under current management direction.

O.2.15 Socioeconomics and Environmental Justice

Impacts Analysis

Summary

Commenters state that the Final EIS should address the local, regional, and national socioeconomic effects related to wind energy in the cumulative effects analysis. Commenters also requested a thorough economic calculation in the Final EIS of the value lost from negative environmental impacts from grazing.

Response
The Lewistown Field Office RMPA/EIS provides an adequate discussion of the environmental consequences, including the cumulative impacts, of the presented alternatives for a broad land use plan-level analyses. See response to **Section O.2.3**, Greater Sage-Grouse—Impact Analysis, of this report for more detailed response.

The Proposed RMPA/Final EIS describes the methodology and assumptions used for conducting the impact analysis (see Sections 4.22.1 and 5.2.1 of the Proposed RMPA/Final EIS). The methodology and assumptions provides an adequate starting point for discussion of the environmental consequences, including the cumulative impacts, of the presented alternatives. As required by 40 CFR, Part 1502.24, the Lewistown Field Office Greater Sage-Grouse RMPA/EIS identifies methodologies used and made reference to the scientific and other sources relied upon for conclusions in the analysis. Based on these methodologies and assumptions, the Proposed RMPA/Final EIS provides sufficiently detailed information to aid in determining whether to proceed with the preferred alternative or make a reasoned choice among the other alternatives in a manner such that the public could have an understanding of the environmental consequences associated with the alternatives, in accordance with 40 CFR, Part 1502.1.

Socioeconomic impacts from the proposed actions in the project area were considered on numerous resources, resource uses, and socioeconomic conditions, which included grazing and ROW energy development. See Sections 4.22 and 5.22 of the Proposed RMPA/Final EIS. Analyzing the federal grazing program is outside the scope for the purpose and need of this project. As stated in Section 5.21 of the Proposed RMPA/Final EIS, 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 renewable energy are the construction of existing and proposed roads and transmission lines. However, as noted in Section 5.22, the five-county impact area can be considered specialized with respect to the grazing sector; therefore, the socioeconomic cumulative effects analysis focused on impacts on livestock grazing.

O.2.16 Soil Resources

Impact Analysis

Summary
The Draft RMPA/EIS did not adequately analyze the impacts of livestock on soils.

Response
The Lewistown Field Office Greater Sage-Grouse RMPA/EIS provides an adequate discussion of the environmental consequences, including the cumulative impacts, of the presented alternatives for a broad land use plan-level

analyses. See response to **Section O.2.3**, Greater Sage-Grouse—Impact Analysis for more detailed response.

Section 4.17 in the Proposed RMPA/Final EIS discusses the effects of livestock grazing on vegetation (ground cover) and the elevated potential for soil erosion. Also as stated in Section 4.17, achieving or maintaining Standards for Rangeland Health and Guidelines for Livestock Management generally is effective in managing effects on soils from livestock grazing. Adjustments to grazing authorizations would be made on a case-by-case basis when site-specific studies indicate changes in management are needed.

O.2.17 Travel Management

Range of Alternatives

Summary
Commenters requested the Final EIS clarify that ranching activities are among authorized off-road uses. Commenters also recommended that a timeframe for travel management planning completion under Alternative D be specified and compensatory mitigation should be included in Alternative D.

Response
As discussed previously under **Section O.2.1**, NEPA—Range of Alternatives, the BLM complied with CEQ regulations in developing the range of alternatives, and the spectrum of actions considered all meet BLM regulations, policy, and guidance.

It should be noted that restrictions in place for travel have exclusions for administrative purposes; for example, cross-country OHV travel is prohibited and must remain on existing travel routes except for administrative purposes (see Sections 1.8.7, Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota, and 3.12.1 in the Proposed RMPA/Final EIS). As stated in **Section 3.12.1**, OHVs must remain on existing travel routes at all times unless travel is administrative use or an exception as described in the OHV ROD (BLM 2003b). The definition of "administrative access" has been added to the Glossary in the Proposed RMPA/Final EIS.

Under the Proposed Plan Amendment, all travel management planning would be completed within five years of signing the ROD. The Proposed Plan Amendment would incorporate the regional mitigation strategy (see Section 2.7.3 and Appendix G of the Proposed RMPA/Final EIS. The mitigation strategy would include compensatory mitigation to provide a conservation gain to GRSG.

O.2.18 Vegetation

Range of Alternatives

Summary
The BLM should include additional measures to target conifer encroachment and ensure no net conifer gain in the Final EIS.

Response
The BLM and NRCS are presently undertaking a conifer removal project in the North Fork of the Belt Mountains to improve GRSG habitat conditions in this area. The Proposed RMPA/Final EIS has been updated to discuss current conditions regarding conifer encroachment in the planning area, including these planned conifer treatments (Section 3.6.3). Section 4.3 of the Proposed RMPA/Final EIS has been revised to discuss the impacts related to these planned projects. As noted in Section 3.4.3 of the Proposed RMPA/Final EIS, the Belt Mountains Population inhabits approximately 300,000 acres of PGH, of which BLM administers 439 acres (0.1 percent). Authority for management decisions for vegetation treatments, including conifer reduction, for this population is therefore limited.

O.2.19 Water Resources

Range of Alternatives

Summary
The Final EIS should use measurable benchmarks, such as Ecological Site Descriptions, for riparian areas. The Final EIS should clarify if allotments in PPH and PGH, and stream proper functioning condition (PFC) ratings are a priority for improvement.

Response
The Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process to develop a reasonable range of alternatives for the RMPA, as discussed in further detail in the response to **Section O.2.1**, NEPA—Range of Alternatives.

Under the Proposed Plan Amendment, watershed areas in PHMA that contain expired or expiring grazing authorizations would be prioritized for renewal. Table 3-46 of the Proposed RMPA/Final EIS summarizes the BLM-administered acres in PPH and PGH not meeting land health standards because of livestock grazing management. Table 3-22 summarizes the stream and riparian conditions in PPH and PGH.

PFC is the BLM-required protocol for assessment of streams and riparian-wetland areas, and it is the minimum standard for achievement of BLM land health standards. The Proposed Plan Amendment goes beyond PFC by requiring

that land health evaluations and determinations include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. Appendix B of the Proposed RMPA/Final EIS addresses mid-scale and fine-scale monitoring.

Ecological site descriptions, riparian PFC protocols, water quality data, and various types of appropriate vegetative, riparian, habitat, and any other applicable data would continue to be used as the basis in allotment evaluations to determine conformance to Standards for Land Health and Guidelines for Livestock Grazing Management.

Cumulative Impact Analysis

Summary
Commenters requested the cumulative impacts analysis discuss the benefits to water developments and include information on compliance with Montana water quality standards.

Response
The BLM understands the potential beneficial cumulative impacts on water resources from water developments and has revised the cumulative impacts analysis in Section 5.18 of the Proposed RMPA/Final EIS. The potential impact of livestock grazing on water quality is described in Section 4.18.2 of the Proposed RMPA/Final EIS. All BLM management actions would be in compliance with state water quality standards, as required by law.

O.2.20 Wilderness Areas/Wilderness Study Areas

Range of Alternatives

Summary
The BLM should employ additional management measures to protect lands with wilderness characteristics. The existing lands with wilderness characteristics inventories are out of date, and the BLM failed to conduct updated inventories for lands with wilderness characteristics.

Response
BLM Manual 6320, Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process, states that, "In some circumstances, consideration of management alternatives for lands with wilderness characteristics may be outside the scope of a particular planning process (as dictated by the statement of purpose and need for the planning effort). For example, a targeted amendment to address a specific project or proposal may not in all circumstances require consideration of an alternative that would protect wilderness characteristics. In these situations, the NEPA document

associated with the plan amendment must still analyze effects of the alternatives on lands with wilderness characteristics" (BLM Manual 6320.06, Policy).

As noted in Section 1.2 of the Proposed RMPA/Final EIS, the purpose of and need for the National Greater Sage-Grouse Planning Strategy is limited to making land use planning decisions specific to the conservation of GRSG habitats. No decisions related to the management of lands with wilderness characteristics would be made as part of this planning effort; therefore, management of lands with wilderness characteristics is considered outside the scope of this plan amendment process.

As part of the original FLPMA Section 603-mandated inventories, inventories were conducted for the Lewistown Field Office in 1979. The intensive inventories published in the early 1980s resulted in the designation of two Wilderness Study Areas (WSAs) that are outside of this planning area. No other inventories have been completed for lands with wilderness characteristics since then; however, inventories are currently underway as part of the RMP revision process, which began in 2013 and is scheduled to be complete in 2017. Lands with wilderness characteristics inventories would be updated for any site-specific project NEPA analyses that are conducted in the planning area to determine if a project would have impacts on lands with wilderness characteristics identified through previous or updated inventory efforts.

O.2.21 Disturbance Cap

Summary

Commenters believed that the Draft RMPA/EIS needed additional explanation for the methodology for establishing the disturbance cap in the alternatives, as well as better explanation for how the actions would be implemented. The BLM needs to show the differences between disturbance cap amounts presented in the alternatives. Fire should be added as a contributing factor in accounting for the disturbance cap.

Response

The three percent disturbance cap in the Draft RMPA/EIS was based on recommendations from the NTT report. As part of the Proposed RMPA/Final EIS, the BLM has provided additional clarification on the disturbance caps, guidance for how they would be implemented and accounted for, and what data is appropriate for determining disturbance (see Appendix N). If the 3 percent anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG Priority PHMA in any given Biologically Significant Unit (BSU), then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) will be permitted by BLM within GRSG PHMAs in any given BSU until the disturbance has been reduced to less than the cap.

If the 3 percent disturbance cap is exceeded on all lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5 percent within a proposed project analysis area in PHMA, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the 1872 hard rock Mining Law, valid existing rights, etc.). If the BLM determines that the State of Montana's GRSG Habitat Conservation Program contains comparable components to those found in the State of Wyoming's Density and Disturbance model (an all lands approach for calculating anthropogenic disturbances, a clear methodology for measuring the density of operations, and a fully operational Density Disturbance Calculation Tool), the 3 percent disturbance cap will be converted to a 5 percent cap.

O.2.22 Predation

Summary

The BLM failed to adequately address impacts on GRSG from predation.

Response

As stated in Section 1.6.4 in the Proposed RMPA/Final EIS, predator control is outside the scope of RMPA. The State of Montana possesses primary authority and responsibility for managing wildlife within the state. The BLM has authority to manage GRSG habitat and has provided analysis to describe how the numerous management actions across the range of alternatives could affect the habitat and indirectly the effects of predation. The Proposed RMPA/Final EIS calls for measures that would substantially reduce disturbances in GRSG habitat, thus reducing predation risk. The Proposed RMPA/Final EIS also calls for careful monitoring of grazing allotments within GRSG nesting habitat to ensure suitable grass and forb cover is reserved so the associated predation risks can be minimized.

Predation is one of five specific ESA listing criteria; however, the USFWS did not identify predation as a significant threat to GRSG populations in their 2010 decision to list the species as warranted for protection under the ESA. The USFWS acknowledged that increasing patterns of landscape fragmentation are likely contributing to increased predation on the species, and identified two areas, neither of which are in Montana, where predators may be limiting GRSG populations because of intense habitat alteration and fragmentation. The BLM has updated the discussion of predation in Section 3.4.1 of the Proposed RMPA/Final EIS. Section 4.3 has been revised to more clearly state the connection between the direct effects to habitat management and indirect effects of predation.

O.2.23 Noise

Summary

Commenters were concerned with the ambient noise levels presented in the Draft EIS and would like clarification on the noise restrictions provided in the alternatives.

Response

Greater sage-grouse conservation measures in A Report on National Greater Sage-grouse Conservation Measures (NTT 2011) were used to form BLM management direction under at least one alternative (Alternative B), which is consistent with the direction provided in BLM WO IM 2012-044 (the BLM must consider all applicable conservation measures developed by the NTT in at least one alternative in the land use planning process).

Ambient noise is assumed to be 22 (may be a range of 20-24) dBA, using Patricelli et al. unless the project proponent documents ambient is higher using specific measuring parameters/methodology. RDFs in Appendices C and D of the Proposed RMPA/Final EIS have been established for noise for all activities, including at the lek and other important seasonal habitats. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area).

O.2.24 Weeds/Invasive Plants

Summary

Commenters requested a description of integrated vegetation management, inclusion of the handbook in the Final EIS, and details on how BLM would address invasive trees in riparian habitats. Commenters also state that the BLM failed to provide adequate analysis of the impacts of weeds related to livestock grazing.

Response

As noted previously in **Section O.2.3**, Greater Sage-Grouse—COT Report, all alternatives considered within this planning process are consistent with conservation measures and objectives outlined in the COT report and follow the basic principles of: 1) avoiding the impact of an activity; 2) minimizing impacts by limiting the degree of activity; and 3) mitigating for an impact by improving or enhancing GRSG habitat. As stated in Section 2.6.2 and Table 2-4 in the Proposed RMPA/Final EIS, all of the alternatives would include implementing integrated vegetation management to control, suppress, and eradicate, where possible, noxious and invasive species, in accordance with BLM Handbook H-1740-2.

The Proposed RMPA/Final EIS provides an adequate discussion of the environmental consequences, including the cumulative impacts, of the presented alternatives for a land use plan-level effort (see response to **Section O.2.3**, Greater Sage-Grouse—COT Report, for additional details). The impacts from livestock grazing on vegetation (including noxious weeds) are discussed in Section 4.5 of the Proposed RMPA/Final EIS.

BLM Handbook 1740-2 is incorporated by reference in the Proposed RMPA/Final EIS.

Regarding Tamarisk and Russian olive, these species have limited presence within PPH and PGH covered under the Lewistown Field Office RMPA/EIS. The Lewistown Field Office currently has assistance agreements in place to provide funding for control measures to the respective county weed agencies should either species be found on BLM-administered lands within the Lewistown Field Office.

Regarding control of invasive weeds through removal of grazing, the noxious weeds found in the area (as defined in Table 3-17 of the Proposed RMPA/Final EIS) are perennial invasive plants that reproduce vegetatively more than they do by seed. Removal of permitted livestock use would do little to prevent spread of such species and eliminate the opportunity for Weed Control Cooperative Agreements with permittees/lessees for the control agreements.

References suggested were reviewed and found to not be relevant for inclusion. The Proposed RMPA/Final EIS also includes additional clarification for vegetation objectives, such as stating that the desired future condition in SFAs and PHMA is to maintain a minimum of 70 percent of lands capable of producing sagebrush, with 10 to 30 percent sagebrush canopy cover.

O.3 COMMENTER LIST

Table O.1 provides the names of organizations and individuals who submitted unique comment letters (not campaign letters) on the Draft RMPA/EIS.

Table O.1
Organizations and Others That Submitted Unique Comment Letters on Lewistown Field Office GRSG Draft RMPA/EIS

Organization
Alberta Wilderness Association
American Motorcyclist Association
American Wind Energy Association
AWEA
Center for Biological Diversity
Defenders of Wildlife
EPA Region 8
EPA, NEPA Compliance and Review Program

Table O.1
Organizations and Others That Submitted Unique Comment Letters on Lewistown Field Office GRSG Draft RMPA/EIS

Organization
MOM & POP PRODUCTS CO.
Montana Audubon
Montana Fish, Wildlife & Parks
Montana Stockgrowers Association
Montana Wilderness Association
Petroleum County
Petroleum County Commissioner
Public Lands Advocacy
Public Lands Council/ National Cattlemen's Beef Association
U.S. Fish and Wildlife Service
Western Watersheds Project
WildEarth Guardians
World Wildlife Fund
Individuals
Ahlegren, Larry
Ahlgren, Diane
Bailey, Joan
Forehand, Dick
Fronczak, David
Gilpatrick, John
Hamann, Betsy
Hohenberger, Kirk
King, Chris
Knapp, Ralph
Kopec, Len
Peters, D'Jeane
Roe, Teddy
Sachau, Barbara
Schultz, John
Sentz, Gene
Sentz, Linda
Steitz, Jim
Tighe, Dennis
Van Hyning, Dyrick
Whirry, Gordon

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