BLM

North Dakota Greater Sage-Grouse Approved Resource Management Plan Amendment

Attachment 2

From the Record of Decision and Approved Resource Management Plan Amendments for the Rocky Mountain Region including the Greater Sage-Grouse Sub-Regions of: Lewistown, North Dakota, Northwest Colorado, and Wyoming and the Approved Resource Management Plans for: Billings, Buffalo, Cody, HiLine, Miles City, Pompeys Pillar National Monument, South Dakota, and Worland

Prepared by
US Department of the Interior
Bureau of Land Management
North Dakota Field Office

September 2015

MISSION STATEMENT

The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM's mission is to manage and conserve the public lands for the use and enjoyment of present and future generations under our mandate of multiple-use and sustained yield. In Fiscal Year 2014, the BLM generated $5.2 billion in receipts from public lands.

BLM/MT/PL-15/008+1610

State Director Recommendation for Approval

I hereby recommend for approval the North Dakota Greater Sage-Grouse Resource Management Plan Amendment.

Jamie E. Connell, Montana/Dakotas State Director

Sept 15, 2015
Date

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APPENDICES

ACRONYMS AND ABBREVIATIONS

	Full Phrase
AMP	allotment management plan
ARMPA	approved resource management plan amendment
BLM	Bureau of Land Management
BSU	biologically significant unit
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COA	condition of approval
COT	Conservation Objectives Team
CSU	controlled surface use
DOI	US Department of the Interior
EIS	environmental impact statement
ES&R	emergency stabilization and rehabilitation
ESA	Endangered Species Act
ESD	ecological site description
FLPMA	Federal Land Policy and Management Act of 1976
GHMA	general habitat management area(s)
GRSG	Greater Sage-Grouse
kV	kilovolt
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NSO	No Surface Occupancy
OHV	off-highway vehicle
PFC	proper functioning condition
PHMA	priority habitat management area(s)
RDF	required design feature
RMP	resource management plan
ROD	record of decision
ROW	right-of-way
USFWS	US Fish and Wildlife Service
WAFWA	Western Association of Fish and Wildlife Agencies

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CHAPTER 1
INTRODUCTION

The Federal Land Policy and Management Act of 1976 (FLPMA) directs the US Department of the Interior (DOI), Bureau of Land Management (BLM) to develop and periodically revise or amend its resource management plans (RMPs), which guide management of BLM-administered lands.

This Approved Resource Management Plan Amendment (ARMPA) is the result of the March 2010 US Fish and Wildlife Service (USFWS) 12-Month Finding for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered (75 *Federal Register* 13910, March 23, 2010; USFWS 2010). In that finding, the USFWS concluded that the Greater Sage-Grouse (GRSG) was "warranted, but precluded" for listing as a threatened or endangered species.

The USFWS reviewed the status of and threats to the GRSG in relation to the five listing factors provided in Section 4(a)(1) of the Endangered Species Act (ESA). The USFWS determined that Factor A, "the present or threatened destruction, modification, or curtailment of the habitat or range of the GRSG," and Factor D, "the inadequacy of existing regulatory mechanisms," posed "a significant threat to the GRSG now and in the foreseeable future" (USFWS 2010). The USFWS identified the principal regulatory mechanisms for the BLM as conservation measures in RMPs.

1.1 DESCRIPTION OF THE NORTH DAKOTA SUBREGIONAL PLANNING AREA

The ARMPA planning area boundary includes all lands regardless of jurisdiction (see **Figure 1-1**, North Dakota Planning Area, Surface Management and Subsurface Estate, and **Figure 1-2**, North Dakota Planning Area, Greater Sage-Grouse Habitat Management Areas across All Jurisdictions). **Table 1-1**, Land Management in the Planning Area, outlines the amount of surface acres that are administered by specific federal agencies, states, local governments, and lands that are privately owned in the planning area. The planning area includes other BLM-administered lands that are not allocated as habitat management areas for GRSG. The ARMPA does not establish any additional management for these lands; these lands will continue to be managed according to the existing, underlying RMP for the area.

The decision area for the ARMPA is BLM-administered lands in GRSG habitat management areas (see **Figure 1-3**, North Dakota Decision Area, Greater Sage-Grouse Habitat Management Areas for BLM Administered Lands), including surface and split-estate lands with BLM subsurface mineral rights. Any

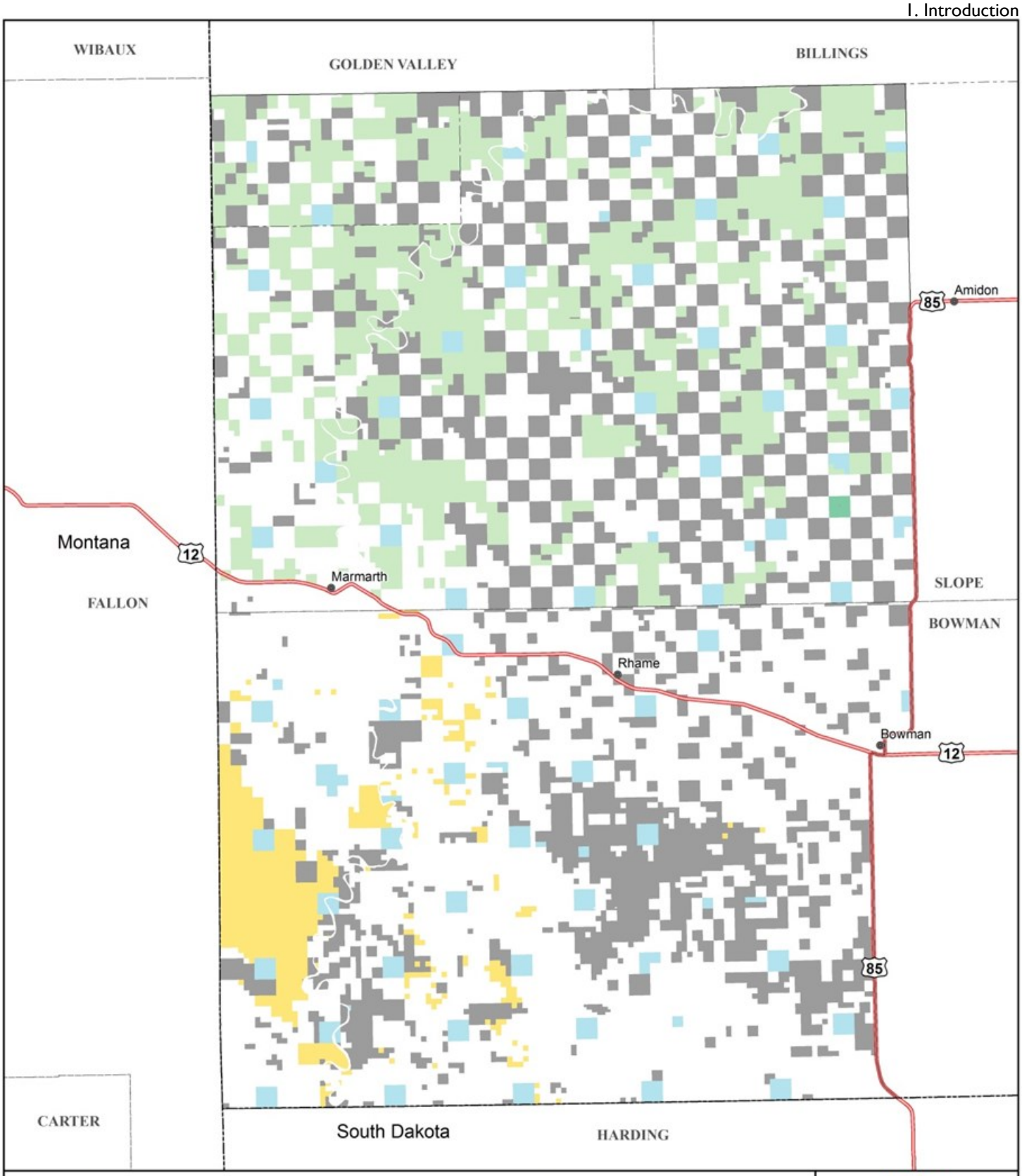

Figure 1-1: North Dakota Planning Area, Surface Management and Sub-Surface Estate

Legend

- Bureau of Land Management
- US Forest Service
- US Fish and Wildlife
- State
- Private/Other
- Non-Federal Surface, Federal Sub-Surface
- Planning Area Boundary
- State Boundary

N W E S

0 4 8 Miles

September 2015

Map Area

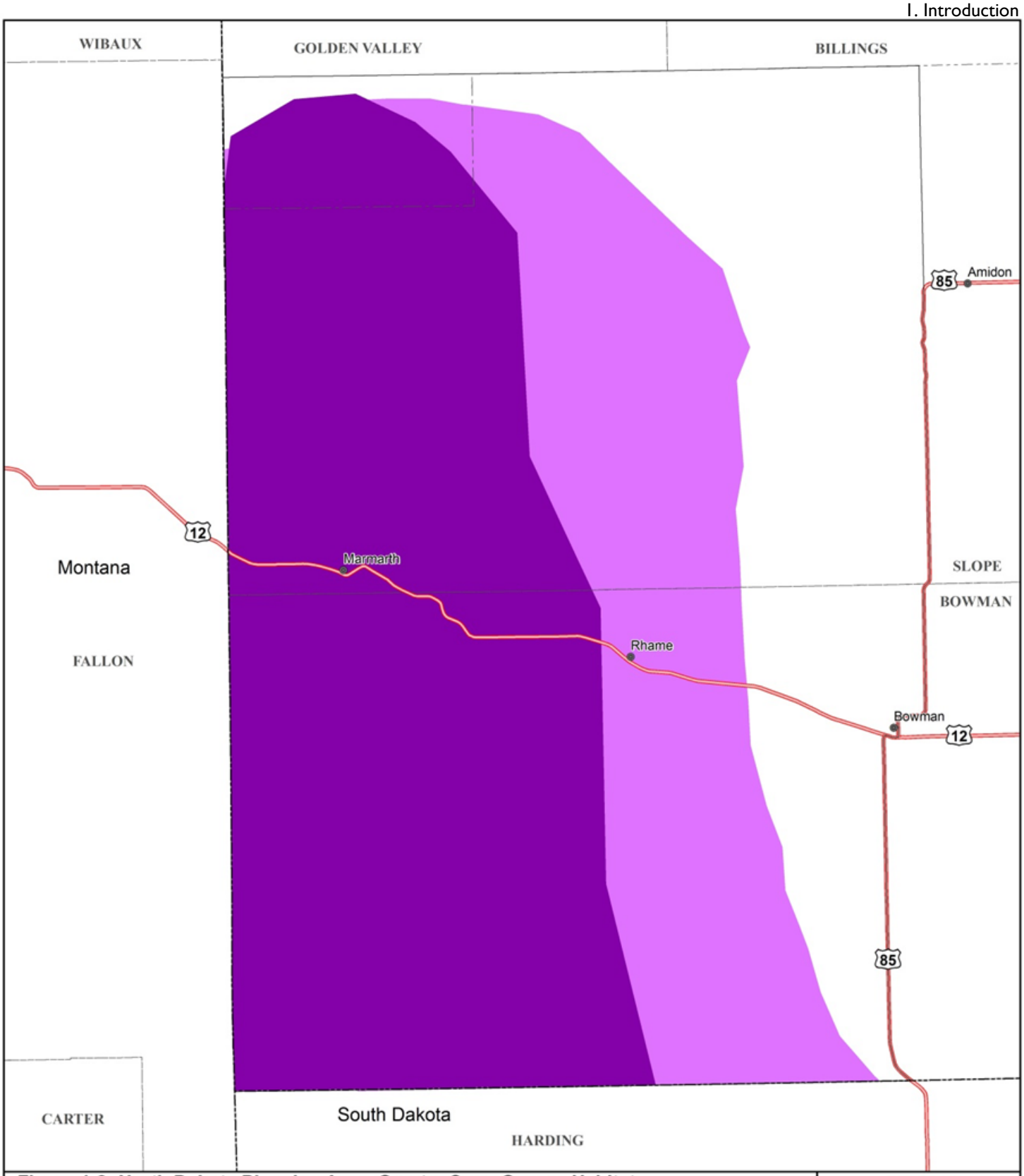

Figure 1-2: North Dakota Planning Area, Greater Sage-Grouse Habitat Management Areas across All Jurisdictions

Legend

- Priority Habitat Management Areas (PHMAs)
- General Habitat Management Areas (GHMAs)
- Planning Area Boundary
- State Boundary

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September 2015

Map Area

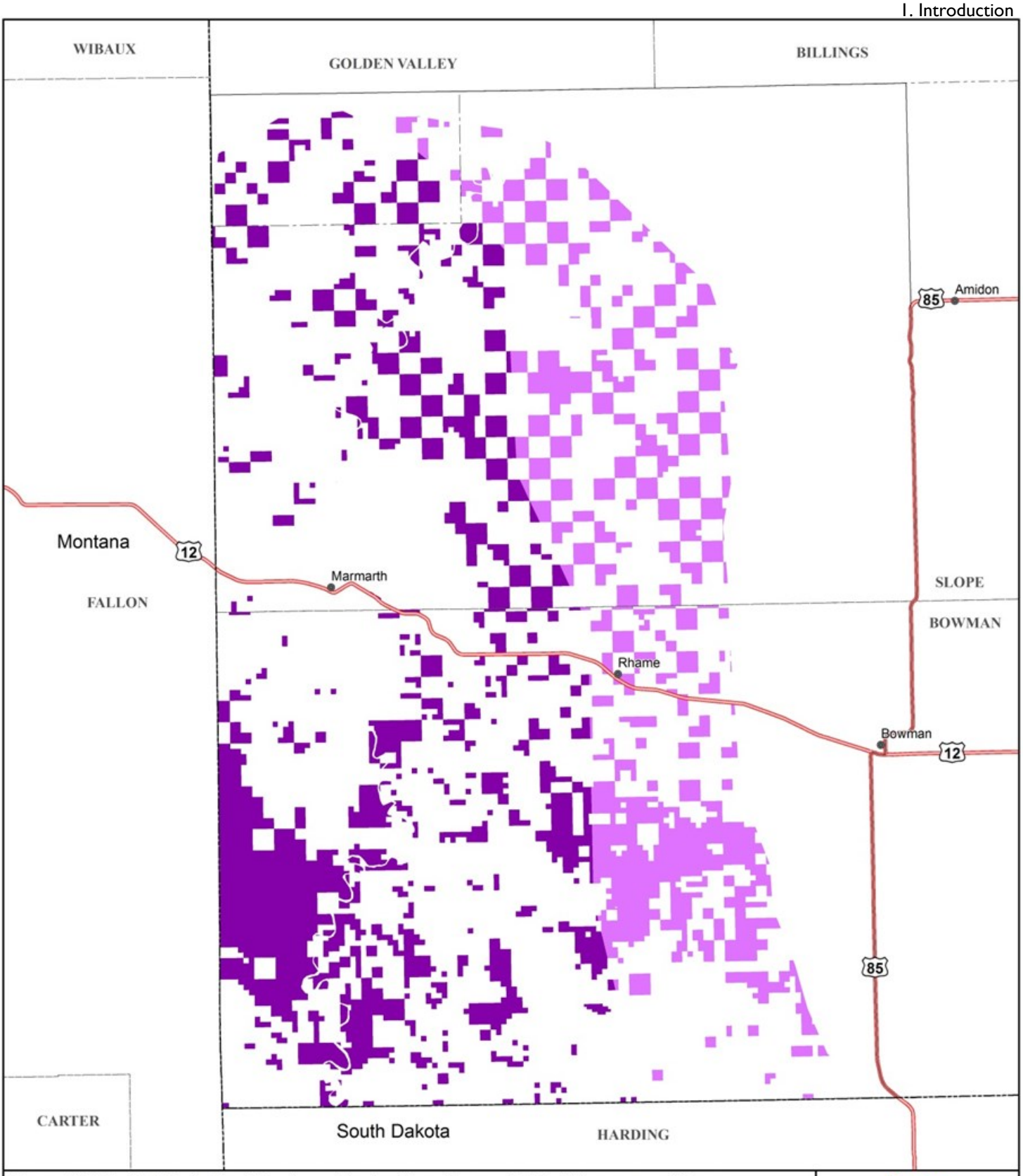

Figure 1-3: North Dakota Decision Area, Greater Sage-Grouse Habitat Management Areas for BLM Administered Lands

Legend

- Priority Habitat Management Areas (PHMAs)
- General Habitat Management Areas (GHMAs)
- Planning Area Boundary
- State Boundary

N W E S

0 4 8 Miles

September 2015

No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Table 1-1
Land Management in the Planning Area

Surface Land Management	Total Surface Land Management Acres
BLM[1]	33,030
Forest Service	140,432
Private	741,607
USFWS	638
North Dakota School Trust	40,894
Water	6,416
Total acres	963,017

Source: BLM 2012
[1]Planning area acres include additional acres that are not PHMA or GHMA on BLM-administered lands.

decisions in the ARMPA apply only to BLM-administered lands, including split-estate lands within GRSG habitat management areas (the decision area). These decisions are limited to providing land use planning direction specific to conserving GRSG and its habitat.

GRSG habitat on BLM-administered lands in the decision area consists of lands allocated as priority habitat management areas (PHMA) and general habitat management areas (GHMA; see **Table 1-2**).

Table 1-2
Acres of PHMA and GHMA in the Decision Area for the ARMPA

Surface and Subsurface Land Management	PHMA	GHMA
BLM-administered surface acres	32,900	80
BLM-administered federal mineral estate	167,291	109,905

Source: BLM 2012

PHMA and GHMA are defined as follows:

- PHMA—BLM-administered lands identified as having the highest value to maintaining sustainable GRSG populations. Areas of PHMA largely coincide with areas identified as Priority Areas for Conservation in the USFWS's Conservation Objectives Team (COT) report. These areas include breeding, late brood-rearing, and winter concentration areas.
- GHMA—BLM-administered lands where some special management will apply to sustain GRSG populations. Areas of occupied seasonal or year-round habitat outside of PHMA.

PHMA and GHMA on BLM-administered lands in the decision area fall within one county in southwestern North Dakota (see **Table 1-3**, Acres of GRSG Habitat by County in the Decision Area (BLM Lands only)[1]).

The North Dakota RMP (BLM 1988) is hereby amended to incorporate appropriate GRSG conservation measures.

Table 1-3
Acres of GRSG Habitat by County in the Decision Area (BLM Lands only)[1]

County Name	ARMPA		
	PHMA	GHMA	TOTAL
Bowman	32,900	80	32,980
Slope	0	0	0
Golden Valley	0	0	0
Total	32,900	80	32,980

Source: BLM 2012
[1]Does not include subsurface mineral estate under BLM jurisdiction.

1.2 PURPOSE AND NEED

The BLM has prepared this ARMPA with an associated environmental impact statement (EIS) to amend the North Dakota RMP for the North Dakota Field Office containing GRSG habitat. This planning process is needed to respond to the USFWS's March 2010 "warranted, but precluded" ESA listing petition decision for GRSG. The USFWS identified (1) the present or threatened destruction, modification, or curtailment of habitat or range and (2) the inadequacy of existing regulatory mechanisms as significant threats, and identified the principal regulatory mechanisms for the BLM as conservation measures incorporated in land use plans.

The purpose of the ARMPA is to identify and incorporate appropriate measures in existing land use plans to conserve, enhance, and restore GRSG habitat by avoiding, minimizing, or compensating for unavoidable impacts on GRSG habitat in the context of the BLM's multiple use and sustained yield mission under FLPMA. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations across the species' range. This ARMPA focuses on areas affected by threats to GRSG habitat identified by the USFWS in the March 2010 listing decision and in the USFWS 2013 COT report.

The major threats to GRSG or its habitat that apply to the North Dakota Subregion (or the Dakotas population) are as follows:

- Infrastructure—Fragmentation of GRSG habitat due to human development activities, such as right-of-way (ROW) and renewable energy development
- Infrastructure—Fragmentation of GRSG habitat due to range improvements
- Invasive species—Conversion of GRSG habitat to invasive annual grass-dominated (e.g., cheatgrass) plant communities
- Wildfire—Loss of large areas of GRSG habitat due to wildfire
- Grazing—Loss of habitat components due to livestock and large wildlife use
- Agriculture and urbanization—Fragmentation of GRSG habitat or modification of GRSG behavior due to conversion of land to agricultural and urban uses
- Disease—Loss of GRSG to disease, primarily West Nile virus

- Hard rock mining/coal strip mining—Fragmentation of GRSG habitat due to mineral exploration and development
- Prescribed fire—Loss of GRSG sagebrush habitat
- Human uses—Fragmentation of GRSG habitat or modification of GRSG behavior due to human uses
- Conifer encroachment—Encroachment of pinyon and juniper into GRSG habitat
- Water development—Fragmentation of GRSG habitat due to range improvements

Based on the relatively limited amount of management authority the BLM has over the designated GRSG habitat within the planning area (approximately 7 percent of the surface estate), coordination and partnerships with private landowners and other agencies will be key to ensuring conservation and habitat improvement.

1.3 NORTH DAKOTA SUBREGIONAL GRSG CONSERVATION SUMMARY

The ARMPA identifies and incorporates conservation measures to conserve, enhance, and restore GRSG habitat by avoiding, minimizing, and compensating for unavoidable impacts of threats to GRSG habitat. The ARMPA addresses threats to GRSG and its habitat identified by the GRSG National Technical Team (NTT), by the USFWS in the March 2010 listing decision, as well as those threats described in the USFWS's COT report. In accordance with that report, the USFWS identified threats by GRSG population across the range and stated whether that threat is present and widespread, present but localized, or unknown for that specific population.

Table 1-4 identifies the GRSG populations and threats identified by the COT contained within the North Dakota Subregion.

Table 1-4
Threats to GRSG in the North Dakota Subregion as identified by the Conservation Objectives Team[1]

GRSG Identified Populations from the COT Report Applicable to the North Dakota Subregion	Unit Number	Isolated Small Size	Sagebrush Elimination	Agriculture Conversion	Fire	Conifers	Weeds/Annual Grasses	Energy	Mining	Infrastructure	Improper Grazing	Free-Roaming Equids	Recreation	Urbanization
North Dakota and South Dakota	I	Y	L	L	Y	U	L	Y	Y	Y	L	N	N	N

Source: USFWS 2013

[1]Threats are characterized as Y = threat is present and widespread, L = threat present but localized, N = threat is not known to be present, and U = unknown.

Table 1-5 provides a crosswalk as to how the ARMPA for the North Dakota Subregion addresses the threats from the COT report.

Table 1-5
Key Components of the North Dakota GRSG ARMPA Addressing COT Report Threats

Threats to GRSG and its Habitat (from COT Report)	Key Component of the North Dakota ARMPA
All threats	• Require and ensure mitigation that provides a net conservation gain to GRSG for actions that result in habitat loss and degradation. • Monitor implementation and effectiveness of conservation measures in GRSG habitats according to the Habitat Assessment Framework.
All development threats, including mining, infrastructure, and energy development	• PHMA—Implement an anthropogenic disturbance cap of 3% within the biologically significant unit (BSU) and proposed project analysis areas. • PHMA—Implement a density cap of an average of 1 energy and mining facility per 640 acres. • Apply necessary buffers based on project type and location to address impacts on leks when authorizing actions in GRSG habitat. • Apply required design features (RDFs) when authorizing actions in GRSG habitat. • Minimize effects of infrastructure projects, including siting, using the best available science, updated as monitoring information on current infrastructure projects becomes available.
Energy development—fluid minerals	• PHMA—Open to fluid mineral leasing subject to no surface occupancy (NSO) stipulation, without waiver or modification and with limited exception. • GHMA—Open to fluid mineral leasing subject to controlled surface use (CSU) stipulation. • Prioritize the leasing and development of fluid mineral resources outside of GRSG habitat.
Energy development—wind energy	• PHMA—Exclusion area (not available for wind energy development under any conditions) • GHMA—Avoidance area (may be available for wind energy development with special stipulations).
Energy development—solar energy	• PHMA—Exclusion area (not available for solar energy development under any conditions). • GHMA—Avoidance area (may be available for solar energy development with special stipulations).
Infrastructure—major ROWs	• PHMA—Avoidance area (may be available for major ROWs with special stipulations). • GHMA—Avoidance area (may be available for major ROWs with special stipulations).
Infrastructure—minor ROWs	• PHMA—Avoidance area (may be available for minor ROWs with special stipulations).
Mining—locatable minerals	• Apply RDFs to locatable minerals consistent with applicable law.
Mining—nonenergy leasable minerals	• PHMA—Closed area (not available for nonenergy leasable minerals).

Table 1-5
Key Components of the North Dakota GRSG ARMPA Addressing COT Report Threats

Threats to GRSG and its Habitat (from COT Report)	Key Component of the North Dakota ARMPA
Mining—salable minerals	• PHMA—Closed area (not available for salable minerals).
Mining—coal	• PHMA is essential habitat for GRSG for purposes of the suitability criteria set forth at 43 Code of Federal Regulations (CFR), Part 3461.5(o)(1).
Improper livestock grazing	• Prioritize the review and processing of grazing permits/leases in PHMA. • Include in the National Environmental Policy Act (NEPA) analysis for renewals and modifications of grazing permits/leases specific management thresholds, based on the GRSG Habitat Objectives Table, land health standards, and ecological site potential, to allow adjustments to grazing that have already been subjected to NEPA analysis. • Prioritize field checks in PHMA to ensure compliance with the terms and conditions of grazing permits
Free-roaming equid (wild horses and burros) management	• Not applicable; free-roaming equids do not occur within the planning area.
Range management structures	• Allow range improvements that do not impact GRSGs or that provide a conservation benefit to GRSGs, such as fences for protecting important seasonal habitats.
Recreation	• PHMA—Do not construct new recreation facilities. • Allow special recreation permits only if their effects on GRSG and its habitat are neutral or beneficial for GRSG habitat.
Fire	• Identify and prioritize areas that are vulnerable to wildfires and prescribe actions important for GRSG protection. • Prioritize post-fire treatments in PHMA.
Nonnative, invasive plant species	• Improve GRSG habitat by restoring native (or desirable) plants and create landscape patterns that most benefit GRSG. • PHMA and GHMA—Monitor for and treat invasive and noxious weed species associated with existing range improvement projects. • Use integrated vegetation management to control, suppress, and eradicate, where possible, noxious and invasive species.
Sagebrush removal	• PHMA—Maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush cover or as consistent with specific ecological site conditions. • Ensure that all BLM use authorizations contain terms and conditions regarding the actions needed to meet or progress toward meeting the habitat objectives for GRSG.
Pinyon and juniper expansion	• Remove conifers encroaching into sagebrush habitats, in a manner that considers tribal cultural values, prioritizing occupied GRSG habitat.
Agricultural conversion and exurban development	• Retain GRSG habitat under federal management.

This ARMPA also identifies and incorporates measures that are designed to conserve, enhance, and restore GRSG habitat. Specifically, the ARMPA requires the following summarized management decisions, subject to valid existing rights:

- Providing a framework for prioritizing areas in PHMA and GHMA for wildfire, invasive annual grass, and conifer treatments
- Requiring specific design features for certain land and realty uses
- Limiting new development where a disturbance cap has been reached
- Including GRSG habitat objectives in land health standards, as appropriate
- Adjusting grazing practices as necessary based on GRSG habitat objectives, land health standards, and ecological site potential

The ARMPA also establishes screening criteria and conditions for new anthropogenic activities in PHMA and GHMA to ensure a net conservation gain to GRSG. The ARMPA will reduce habitat disturbance and fragmentation by limiting surface-disturbing activities, while addressing changes in resource condition and use through monitoring and plan evaluations.

For a full description of the BLM's ARMPA, see **Section 2**, Approved Resource Management Plan Amendment.

1.4 PLANNING CRITERIA

Planning criteria are based on appropriate laws, regulations, BLM manual and handbook sections, and policy directives. Criteria are also based on public participation and coordination with cooperating agencies, other federal agencies, state and local governments, and Native American tribes. Planning criteria are the standards, rules, and factors used as a framework to resolve issues and develop alternatives. Planning criteria are prepared to ensure decision-making is tailored to the issues and to ensure that the BLM avoid unnecessary data collection and analysis. Preliminary planning criteria were included in the Draft RMPA/Draft EIS and were further refined for the Proposed RMPA/Final EIS.

Planning criteria carried forward for this ARMPA are as follows:

- The BLM used the USFWS's Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report (USFWS 2013), Western Association of Fish and Wildlife Agencies' (WAFWA) Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (Connelly et al. 2004), US Geological Survey's Summary of Science, Activities, Programs and Policies that Influence the Rangewide Conservation of Greater Sage-Grouse (*Centrocercus urophasianus*) (Manier et al. 2013), and any other appropriate resources to identify GRSG habitat requirements and BMPs.
- The ARMPA is consistent with the BLM's 2011 National Sage-Grouse Conservation Strategy.
- The ARMPA complies with FLPMA, NEPA, and Council on Environmental Quality (CEQ) regulations at 40 CFR, Parts 1500-1508, and DOI regulations at 43 CFR, Parts 46 and 1600; the BLM H-1601-1 Land Use Planning Handbook, "Appendix C: Program-Specific and Resource-Specific Decision Guidance Requirements" for affected resource programs (BLM

2005); the 2008 BLM NEPA Handbook (H-1790-1; BLM 2008); and all other applicable BLM policies and guidance.

- The ARMPA is limited to making land use planning decisions specific to the conservation of GRSG habitat.
- The BLM considered allocations and prescriptive standards to conserve GRSG habitat, as well as objectives and management actions to restore, enhance, and improve GRSG habitat.
- The ARMPA recognizes valid existing rights.
- Lands addressed in the ARMPA are BLM-administered lands (including surface estate/split-estate lands) in GRSG habitats. Any decisions in the ARMPA apply only to BLM-administered lands.
- The BLM used a collaborative and multi-jurisdictional approach, where appropriate, to determine the desired future condition of BLM-administered lands for the conservation of GRSG and their habitats.
- As described by law and policy, the BLM ensured that conservation measures are as consistent as possible with other planning jurisdictions within the planning area boundaries.
- The BLM considered a range of reasonable alternatives, including appropriate management prescriptions that focus on the relative values of resources, while contributing to the conservation of the GRSG and its habitat.
- The BLM analyzed socioeconomic impacts of the alternatives, using an accepted input-output quantitative model, such as IMPLAN.
- The BLM used current scientific information, research, and technologies and the results of inventory, monitoring, and coordination to determine appropriate local and regional management strategies that will enhance or restore GRSG habitat.
- For BLM-administered lands, all activities and uses within GRSG habitats follow existing land health standards. Guidelines for livestock grazing and other programs that have developed guidelines are applicable to all alternatives for BLM-administered lands.
- The BLM consulted with Native American tribes.
- The BLM coordinated with state, local, and tribal governments to ensure that it considered provisions of pertinent plans, resolved inconsistencies between state, local, and tribal plans, and provided ample opportunities for state, local, and tribal governments to comment on the development of amendments or revisions.
- Reasonably foreseeable development scenarios and planning for fluid minerals followed BLM Handbook H-1624-1 (BLM 1990) and current fluid minerals manual guidance for fluid mineral (oil and gas, coal bed methane, oil shale) and geothermal resources.
- The RMPAs were developed using an interdisciplinary approach to prepare reasonably foreseeable development scenarios, to identify alternatives, and to analyze resource impacts, including cumulative impacts on natural and cultural resources and the social and economic environment.

- The most current, approved, BLM corporate spatial data was supported by current metadata and used to ascertain GRSG habitat extent and quality. Data was consistent with the principles of the Information Quality Act of 2000 (Data Quality Act).
- State game and fish agencies' GRSG data and expertise was used to the fullest extent practicable in making management determinations on federal lands. State game and fish agencies have the responsibility and authority to manage wildlife.
- Analysis of impacts in the plan amendments addressed the resources and resource programs identified in the National Technical Team report (A Report on National Greater Sage-Grouse Conservation Measures; NTT 2011) and alternatives that contained specific management measures for conservation of GRSG habitat.
- Resources and resource programs that do not contain specific management direction for GRSG and that may be indirectly affected by proposed management actions were identified and discussed only to the degree required to fully understand the range of effects of the proposed management actions.
- Where more restrictive land use allocations or decisions are made in the North Dakota RMP for such other resources as cultural and riparian, those more restrictive land use allocations or decisions will remain in effect and are not amended by this ARMPA.

CHAPTER 2
APPROVED RESOURCE MANAGEMENT PLAN AMENDMENT

2.1 APPROVED RESOURCE MANAGEMENT PLAN AMENDMENT INSTRUCTIONS

This ARMPA is now the baseline plan for management for GRSG in North Dakota Field Office. The ARMPA adopts the management described in the North Dakota Greater Sage-Grouse Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (2015), with modifications and clarifications as described in the *Modifications and Clarifications* section of the record of decision (ROD).

In the event there are inconsistencies or discrepancies between previously approved RMPs and this ARMPA, the decisions contained in this ARMPA will be followed, unless there are more restrictive decisions in the existing plans. The more restrictive decisions in the existing plans will be implemented. The BLM will continue to tier to statewide, national, and programmatic EISs and NEPA and other planning documents. The BLM will consider and apply RDFs or other management protocols contained in other planning documents after appropriate site-specific analysis.

All future resource authorizations and actions in GRSG habitat will conform to or be consistent with the decisions contained in this ARMPA. All existing operations and activities authorized under permits, contracts, cooperative agreements, or other authorizations will be modified, as necessary and appropriate, to conform to this plan amendment within a reasonable time frame. However, this ARMPA does not repeal valid existing rights on public lands. A valid existing right is a claim or authorization that takes precedence over the decisions developed in this plan. If such authorizations come up for review and can be modified, they will also be brought into conformance with this plan amendment, as appropriate.

While the Final EIS for the North Dakota Proposed GRSG RMP Amendment constitutes compliance with NEPA for the broad-scale decisions made in this ARMPA, the BLM will continue to prepare environmental assessments and EISs where appropriate as part of implementation level planning and decision-making.

2.2 GOALS, OBJECTIVES, AND MANAGEMENT DECISIONS

This section of the ARMPA presents the goals, objectives, land use allocations, and management actions established for protecting and preserving GRSG and its habitat on public lands managed by the BLM in North Dakota. These management actions/decisions are presented by program area. A *Monitoring Framework* is also included (in **Appendix D**) to describe how the implemented program decisions will be monitored.

This section is organized by program area beginning with the Special Status Species (SS) program, which identifies specific goals, objectives, and management actions for GRSG and its habitat. For ease of identification into the future, each program area has identified abbreviations (see below) for these program areas and each decision in that program is numbered in coordination with the abbreviation:

- Special Status Species **(SSS)**
- Habitat Restoration/Vegetation Management **(VEG)**
- Fire and Fuels Management **(FIRE)**
  - Fuels Management
  - Fire Operations
  - Emergency Stabilization and Rehabilitation
- Livestock Grazing **(LG)**
  - Implementation Management Action After Land Health Evaluations
  - Riparian Areas and Wet Meadows
  - Treatments to Increase Forage for Livestock/Wild Ungulates
  - Structural Range Improvement and Livestock Management Tools
- Mineral Resources **(MR)**
  - Unleased Federal Fluid Mineral Estate
  - Leased Federal Fluid Mineral Estate
  - Coal
  - Locatable Minerals
  - Mineral Materials
  - Nonenergy Leasable Minerals
  - Mineral Split Estate
- Lands and Realty **(LR)**
  - Rights-of-Way
  - Land Tenure Adjustment
- Recreation **(REC)**
- Travel and Transportation **(TTM)**

Table 2-1 is a summary of the allocation decisions presented for each GRSG habitat management area.

Table 2-1
Summary of Allocation Decisions by GRSG Habitat Management Areas

Resource	PHMA	GHMA
Land Tenure	Retain	Retain
Solar	Exclusion	Avoidance
Wind	Exclusion	Avoidance
Major ROWs	Avoidance	Avoidance
Minor ROWs	Avoidance	Open
Oil and Gas	Open with Major Stipulations	Open with Minor Stipulations
Geothermal	Open with Major Stipulations	Open with Minor Stipulations
Nonenergy Leasables	Closed	Open
Mineral Materials	Closed	Open
Locatable Minerals	Open	Open
Travel Management	Limited	Limited
Livestock Grazing	Open	Open

2.2.1 Special Status Species (SSS)

Goal SSS-1: Maintain and/or increase GRSG abundance and distribution by conserving, enhancing, or restoring the sagebrush ecosystem upon which populations depend, in cooperation with other conservation partners.

Objective SSS-1.1: Protect PHMA from anthropogenic disturbances that will reduce distribution or abundance of GRSG. Manage PHMA so that discrete anthropogenic disturbances cover less than 3% of the total GRSG habitat.

Objective SSS-1.2: Habitat Delineation: Delineate PHMA to encompass the 100% Breeding Bird Density map: 32,900 BLM surface acres (7% of total PHMA acres). Since mapping 75% of breeding bird density map misses the majority of GRSG habitat in North Dakota, 100% was used. See **Figure 2-1**, North Dakota Habitat Management Areas (**Appendix A**, Approved RMP Amendment Maps).

Objective SSS-1.3: Habitat Delineation: Delineate GHMA to encompass the remainder of the habitat: 80 BLM surface acres. See **Figure 2-1** (**Appendix A**).

Objective SSS-1.4: These habitat objectives in **Table 2-2**, Habitat Objectives for GRSG, summarize the characteristics that research has found represent the seasonal habitat needs for GRSG. The specific seasonal components identified in **Table 2-2** were adjusted based on local science and monitoring data to define the range of characteristics used in this subregion. Thus, the habitat objectives provide the broad vegetative conditions we strive to obtain across the landscape that indicate the seasonal habitats used by GRSG. These habitat indicators are consistent with the rangeland health indicators used by the BLM.

Table 2-2
Habitat Objectives for GRSG

Attribute	Indicators	Desired Condition	Reference
BREEDING AND NESTING (Seasonal Use Period March 1 - June 15)			
Lek Security	Proximity of trees	0.388 miles avoidance of coniferous habitats	Doherty, K. E. 2008. *Sage-grouse and Energy Development: Integrating Science with Conservation Planning to Reduce Impacts*. (Doctoral dissertation, the University of (Montana) Missoula. Internet website: http://etd.lib.umt.edu/theses/available/etd-03262009-132629/unrestricted/doherty.pdf.
	Proximity of sagebrush to leks	Adjacent protective sagebrush cover within 328 feet (ft.) (100 meters [m]) of an occupied lek	*Sage-Grouse Habitat Assessment Framework, Multi-scale Habitat Assessment Tool* (unpublished report). August 2010. BLM, Idaho State Office. Boise.
Cover	% of seasonal habitat meeting desired conditions	80% of the nesting habitat within 3.1 miles of GRSG leks meets the recommended vegetation characteristics, where appropriate (relative to ecological site potential, etc.)	Knick, S. T. and J. W. Connelly, 2011. *Greater Sage-grouse, Ecology and Conservation of a Landscape Species and its Habitats*. Studies in Avian Biology No. 38. A Publication of the Cooper Ornithological Society, University of California Press. Berkeley. pp. 1–9. Stiver, S. J., E. T. Rinkes, D. E. Naugle, 2010. *Sage-Grouse Habitat Assessment Framework.* US Bureau of Land Management, Idaho State Office, Boise.
	Sagebrush cover	≥5-25%	Herman—Brunson, K. M. 2007. *Nesting and Brood-rearing success and habitat selection of Greater Sage-Grouse and associated survival of hens and broods at the edge of their historic distribution.* Master's thesis, South Dakota State University, Brookings. Swanson, C. C. 2009. *Ecology of Greater Sage-grouse in the Dakotas.* Doctor of Philosophy, South Dakota State University, Brookings. Doherty, K. E., Naugle, D. E., Walker, B. L. 2010. *Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales.* The Journal of Wildlife Management 74 (7):1544-1553. 2010.
	Sagebrush height	7-30 inches	Swanson, C. C. 2009. *Ecology of Greater Sage-grouse in the Dakotas.* Doctor of Philosophy, South Dakota State University, Brookings. Holloran, M. J., Heath, B. J., Lyon, A. G. 2005. *Greater Sage-Grouse Nesting Habitat Selection and Success in Wyoming.* Journal of Wildlife Management 69 (2):638-649. Herman—Brunson, K. M. 2007. *Nesting and Brood-rearing success and habitat selection of Greater Sage-Grouse and associated survival of hens and broods at the edge of their historic distribution.* Master's thesis, South Dakota State University, Brookings.

Table 2-2
Habitat Objectives for GRSG

Attribute	Indicators	Desired Condition	Reference
	Predominant sagebrush shape	Predominately spreading shape	Stiver, S. J., E. T. Rinkes, D. E. Naugle, 2010. *Sage-Grouse Habitat Assessment Framework.* US Bureau of Land Management, Idaho State Office, Boise.
	Perennial grass cover (such as native grasses)	≥10% Not Continuous	Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1 Holloran, M. J., Heath, B. J., Lyon, A. G. 2005. "Greater Sage-Grouse Nesting Habitat Selection and Success in Wyoming." *Journal of Wildlife Management* 69 (2):638-649. 2005. Doherty, K. E., Naugle, D. E., Walker, B. L. 2010. "Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales." *The Journal of Wildlife Management* 74 (7):1544-1553. 2010 Hagen, C. A., Connelly, J. W., Schroedeer, M. A. 2007. *A Meta-analysis of Greater Sage-grouse Centrocercus urophasianus Nesting and Brood-rearing Habitats.* Wildlife Biology, 13 (sp1):42-50.
	Perennial grass and forb height (includes residual grasses)	Adequate nest cover based on ecological site potential and seasonal precipitation; 4.4-11.3 inches[1]	K. E. Doherty, K. E. Naugle, J. D. Tack, B. L. Walker, J. M. Graham and J. L. Beck. *Linking conservation actions to demography: grass height explains variation in greater sage-grouse nest survival.* Wildlife Biology 20 (6):320-326. 2014.
	Perennial forb cover	≥5% Not Continuous	Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1 Holloran, M. J., Heath, B. J., Lyon, A. G. 2005. *Greater Sage-Grouse Nesting Habitat Selection and Success in Wyoming.* Journal of Wildlife Management 69 (2):638-649. Doherty, K. E., Naugle, D. E., Walker, B. L. 2010. *Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales.* The Journal of Wildlife Management 74 (7):1544-1553. Hagen, C. A., Connelly, J. W., Schroedeer, M. A. 2007. *A Meta-analysis of Greater Sage-grouse Centrocercus urophasianus Nesting and Brood-rearing Habitats.* Wildlife Biology, 13 (sp1):42-50.

Table 2-2
Habitat Objectives for GRSG

Attribute	Indicators	Desired Condition	Reference
BROOD-REARING/SUMMER (Seasonal Use Period June 16-October 31)			
Cover	% of seasonal habitat meeting desired condition	>40% of the brood-rearing/summer habitat meets recommended brood habitat characteristics where appropriate, relative to site potential and seasonal precipitation.	Stiver, S. J., E. T. Rinkes, D. E. Naugle, 2010. *Sage-Grouse Habitat Assessment Framework.* US Bureau of Land Management, Idaho State Office, Boise.
	Sagebrush cover	≥5 %	Herman—Brunson, K. M. 2007. *Nesting and Brood-rearing success and habitat selection of Greater Sage-Grouse and associated survival of hens and broods at the edge of their historic distribution.* Master's thesis, South Dakota State University, Brookings. Swanson, C. C. 2009. *Ecology of Greater Sage-grouse in the Dakotas.* Doctor of Philosophy, South Dakota State University, Brookings. Doherty, K. E., Naugle, D. E., Walker, B. L. 2010. *Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales.* The Journal of Wildlife Management 74 (7):1544-1553. Hagen, C. A., Connelly, J. W., Schroedeer, M. A. 2007. *A Meta-analysis of Greater Sage-grouse Centrocercus urophasianus Nesting and Brood-rearing Habitats.* Wildlife Biology, 13 (sp1):42-50. Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1.
	Sagebrush height	7-30 inches	Herman—Brunson, K. M. 2007. *Nesting and Brood-rearing success and habitat selection of Greater Sage-Grouse and associated survival of hens and broods at the edge of their historic distribution.* Master's thesis, South Dakota State University, Brookings. Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1. Holloran, M. J., Heath, B. J., Lyon, A. G. 2005. *Greater Sage-Grouse Nesting Habitat Selection and Success in Wyoming.* Journal of Wildlife Management 69 (2):638-649.

Table 2-2
Habitat Objectives for GRSG

Attribute	Indicators	Desired Condition	Reference
			Schroeder et al. 1999. *Greater Sage-Grouse (Centrocercus urophasianus*) [Internet website], The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Accessed February 22, 2011. Available at: Birds of North America Online: http://bna.birds.cornell.edu/bna/species/425/articles/introduction
	Perennial grass and forbs	≥20% Forbs 6-16%	Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1. Holloran, M. J., Heath, B. J., Lyon, A. G. 2005. *Greater Sage-Grouse Nesting Habitat Selection and Success in Wyoming.* Journal of Wildlife Management 69 (2):638-649. Doherty, K. E., Naugle, D. E., Walker, B. L. 2010. *Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales.* The Journal of Wildlife Management 74 (7):1544-1553. Herman—Brunson, K. M. 2007. *Nesting and Brood-rearing success and habitat selection of Greater Sage-Grouse and associated survival of hens and broods at the edge of their historic distribution.* Master's thesis, South Dakota State University, Brooking.
	Riparian areas/mesic meadows	Proper Functioning Condition	BLM, 1997c. *Record of Decision for Standards for Rangeland Health and Guidelines for Livestock Grazing Management Final Environmental Impact Statement for Montana and North and South Dakota.* August 7, 1997. BLM, Montana State Office. Billings. Prichard, D., F. Berg, S. Leonard, M. Manning, W. Hagenbuck, R. Krapf, C. Noble, J. Staats, and R. Leinard. 1999. *Riparian Area Management A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas (TR 1737-16).* Prepared for the United States Department of the Interior and the United States Department of Agriculture. BLM, National Applied Resource Sciences Center. Denver, Colorado. Prichard, D., 1998. *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (TR 1737-15).* Prepared for the United States Department of the Interior and the United States Department of Agriculture. BLM, National Applied Resource Sciences Center. Denver, Colorado.

Table 2-2
Habitat Objectives for GRSG

Attribute	Indicators	Desired Condition	Reference
	Upland and riparian perennial forb availability	Preferred forbs are common with several preferred species present.	Stiver, S. J., E. T. Rinkes, D. E. Naugle, 2010. *Sage-Grouse Habitat Assessment Framework.* US Bureau of Land Management, Idaho State Office, Boise. Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1.
WINTER (Seasonal Use Period November 1-February 28)			
Cover and Food	% of seasonal habitat meeting desired conditions	>80% of wintering habitat meets winter habitat characteristics where appropriate (relative to ecological site, etc.).	Stiver, S. J., E. T. Rinkes, D. E. Naugle, 2010. *Sage-Grouse Habitat Assessment Framework.* US Bureau of Land Management, Idaho State Office, Boise.
	Sagebrush cover above snow	≥10%	Schroeder et al. 1999. *Greater Sage-Grouse (Centrocercus urophasianus*) [Internet website], The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Accessed February 22, 2011. Internet website: *Birds of North America* Online: http://bna.birds.cornell.edu/bna/species/425/articles/introduction Swanson, C. C. 2009. *Ecology of Greater Sage-grouse in the Dakotas.* Doctor of Philosophy, South Dakota State University, Brookings.
	Sagebrush height above snow	≥ 6 inches	(Schroeder et al. 1999. *Greater Sage-Grouse (Centrocercus urophasianus*) [Internet website], The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Accessed February 22, 2011. Available at: Birds of North America Online: http://bna.birds.cornell.edu/bna/species/425/articles/introduction Doherty, K. E., Beck, J. L., Naugle, D. E. 2011. *Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success.* Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1. Swanson, C. C. 2009. *Ecology of Greater Sage-grouse in the Dakotas.* Doctor of Philosophy, South Dakota State University, Brookings.

[1]Specific height requirements needed to meet the objective will be set at the time of watershed assessments.

The habitat objectives will be part of the GRSG habitat assessment to be used during land health evaluations (see **Appendix D**, The Greater Sage-Grouse Monitoring Framework). These habitat objectives are not obtainable on every acre within the designated GRSG habitat management areas. Therefore, the determination on whether the objectives have been met will be based on the specific site's ecological ability to meet the desired condition identified in **Table 2-2**.

All BLM use authorizations will contain terms and conditions regarding the actions needed to meet or progress toward meeting the habitat objectives. If monitoring data show the habitat objectives have not been met nor progress being made towards meeting them, there will be an evaluation and a determination made as to the cause. If it is determined that the authorized use is a cause, the use will be adjusted by the response specified in the instrument that authorized the use.

Management Actions

Action SSS-1.1: Protect PHMA from anthropogenic disturbances that will reduce distribution or abundance of GRSG. See **Appendix E**, Greater Sage-Grouse Disturbance Caps. In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the US Geological Survey Report Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review (Open File Report 2014-1239) in accordance with **Appendix B**, Applying Lek Buffer Distances When Approving Actions.

Action SSS-1.2: If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of landownership) within GRSG PHMA in any given BSU (see **Figure 2-2**, North Dakota and South Dakota GRSG Biologically Significant Unit and Priority Habitat Management Areas [**Appendix A**]), 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. (BSU for this ARMPA is the summary of all the PHMA within the Dakotas GRSG population as delineated by USFWS.)

Action SSS-1.3: If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of landownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a project analysis area in PHMA, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the cap.

Action SSS-1.4: Subject to applicable laws and regulations and valid existing rights, if the average density of one energy and mining facility per 640 acres (the density cap) is exceeded on all lands (regardless of landownership) in the PHMA within a proposed project analysis area, then no further disturbance from energy or mining facilities will be permitted by BLM: (1) until disturbance in the proposed project analysis area has been reduced to maintain the limit under the cap; or (2) unless the energy or mining facility is co-located into an existing disturbed area.

Action SSS-1.5: Implement Regional Mitigation Strategy (**Appendix F**, Regional Mitigation Strategy).

2.2.2 Habitat Restoration/Vegetation Management (VEG)

Objective VEG-1.1: In all PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush cover or as consistent with specific ecological site conditions. The attributes necessary to sustain these habitats are described in Interpreting Indicators of Rangeland Health (BLM Tech Ref 1734-6).

Management Actions

Action VEG-1.1: Remove conifers encroaching into sagebrush habitats, in a manner that considers tribal cultural values. Prioritize treatments closest to occupied GRSG habitats and near occupied leks, and where juniper encroachment is phase 1 or phase 2. Use of site-specific analysis and principles like those included in RMRS-GTR-326: Using resistance and resilience concepts to reduce impacts of invasive annual grasses and altered fire regimes on the sagebrush ecosystem and GRSG: A strategic multi-scale approach (Chambers et al., 2014) and other ongoing modeling efforts to address conifer encroachment will help refine the location for specific priority areas to be treated.

Action VEG -1.2: Consideration for other threatened, endangered or sensitive species will be evaluated in addition to GRSG when prioritizing restoration projects.

Action VEG -1.3: Include GRSG habitat parameters as defined by State of North Dakota Sage-Grouse conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within PHMA the highest restoration priority, along with other priority species habitat.

Action VEG -1.4: In PHMA, require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Where probability of success or adapted seed availability is low, non-native seeds may be used as long as they support GRSG habitat objectives.

Action VEG -1.5: Design post restoration management to ensure long-term persistence in PHMA. This could include changes in livestock grazing management, travel management, etc., to achieve and maintain the desired condition of the restoration effort that benefits GRSG.

Action VEG -1.6: In PHMA, consider potential changes in climate when proposing restoration seedings when using native plants. Consider collection from the warmer component of the species current range when selecting native species.

Action VEG -1.7: In PHMA, restore native (or desirable) plants and create landscape patterns which most benefit GRSG, as well as other priority species.

Action VEG -1.8: Make re-establishment of sagebrush cover and desirable understory plants (relative to ecological site potential) a high priority for restoration efforts in PHMA. Prioritize areas for juniper removal to benefit GRSG habitat.

Action VEG -1.9: In PHMA fire prone areas, where sagebrush seed is required for GRSG habitat restoration, consider establishing seed harvest areas that are managed for seed production and are a priority for protection from outside disturbances.

Action VEG - 1.10: Treat areas that contain cheatgrass and other invasive or noxious species to minimize competition and favor establishment of desired species.

2.2.3 Fire and Fuels Management (FIRE)

Fuels Management

Management Actions

Action FIRE-1.1: In PHMA, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems.

- Do not reduce sagebrush cover to less than 15% unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of PHMA and conserve habitat quality for the species. Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in future NEPA documents.
- Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area.
- If prescribed fire is used in GRSG habitat, the NEPA analysis for the Burn Plan will address:
  - why alternative techniques were not selected as a viable options;
  - how GRSG goals and objectives will be met by its use;
  - how the COT report objectives will be addressed and met;
  - a risk assessment to address how potential threats to GRSG habitat will be minimized.
- Prescribed fire as a vegetation or fuels treatment shall only be considered after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Prescribed fire can be used to meet specific fuels objectives that will protect GRSG habitat in PHMA (e.g., creation of fuel breaks that will disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, burning slash piles from conifer reduction treatments, used as a component with other treatment methods to combat annual grasses and restore native plant communities).
- Prescribed fire in known winter range shall only be considered after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Any prescribed fire in winter habitat will need to be designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality.
- Monitor and control invasive vegetation post-treatment.
- Rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise.
- Require use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet GRSG habitat objectives.
- Design post fuels management projects to ensure long-term persistence of seeded or pre-treatment native plants. This may require temporary or long-term changes in livestock

grazing management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project.

Action FIRE -1.2: Design fuels management projects in PHMA to strategically and effectively reduce wildfire threats in the greatest area.

Action FIRE -1.3: In PHMA, during fuels management project design, consider the utility of using livestock to strategically reduce fine fuels, and implement grazing management that will accomplish this objective. Consult with ecologists to minimize impacts on native perennial grasses.

Action FIRE -1.4: If prescribed fire is used, the Burn Plan will clearly indicate how COT objectives will be addressed and met, and why alternative techniques are not applicable. A fire risk assessment will be completed for implementation of prescribed fire used to meet the GRSG goals and objectives in PHMA (see **Appendix H**, GRSG Wildfire and Invasive Species Habitat Assessment).

Fire Operations

Management Actions

Action FIRE -1.5: The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be done based on the values to be protected, human health and safety, and the costs of protection**.** In PHMA, prioritize suppression, immediately after life and property, to conserve the habitat. See **Appendix H**, which will be completed to help further refine fire management actions once this plan is completed.

Action FIRE -1.6: In GHMA, prioritize suppression where wildfires threaten PHMA.

Action FIRE -1.7: Follow the most current BMPs/RDFs for fire and fuels (**Appendix C**, Required Design Features).

Emergency Stabilization and Rehabilitation

Management Actions

Action FIRE -1.8: In PHMA, prioritize native seed allocation for use in GRSG habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from emergency stabilization and rehabilitation (ES&R) projects outside of PHMA to those inside it. Use of native plant seeds for ES&R seedings is required based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet GRSG habitat conservation objectives. Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.

Action FIRE -1.9: In PHMA, design post ES&R management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, and travel management, etc., to achieve and maintain the desired condition of ES&R projects to benefit GRSG.

Action FIRE -1.10: In PHMA, consider potential changes in climate when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed.

2.2.4 Livestock Grazing (LG)

Management Actions

Action LG-1.1: Grazing will be allowed on all lands identified as suitable (approximately 32,945 acres). See **Figure 2-3**, North Dakota Livestock Grazing (**Appendix A**).

Action LG-1.2: Allocate up to an estimated 5,780 animal unit months to livestock in the long term (livestock use set at 25% of average annual forage production).

Action LG-1.3: Within PHMA, incorporate GRSG habitat objectives and management considerations into all BLM grazing allotments through allotment management plans (AMP) or permit renewals. Develop standards with State of North Dakota and USFWS.

Action LG-1.4: In PHMA, work cooperatively on integrated ranch planning within GRSG habitat so operations with deeded/BLM allotments can be planned as single units.

Action LG-1.5: The BLM will prioritize (1) the review of grazing permits/leases, in particular to determine if modification is necessary prior to renewal, and (2) the processing of grazing permits/leases in PHMA. In setting workload priorities, precedence will be given to existing permits/leases in these areas not meeting Land Health Standards, with focus on those containing riparian areas, including wet meadows. The BLM may use other criteria for prioritization to respond to urgent natural resource concerns (such as fire) and legal obligations.

The NEPA analysis for renewals and modifications of livestock grazing permits/leases that include lands within PHMA will include specific management thresholds, based on GRSG Habitat Objectives (**Table 2-2**), Land Health Standards (43 CFR, Part 4180.2) and ecological site potential, and one or more defined responses that will allow the authorizing officer to make adjustments to livestock grazing that have already been subjected to NEPA analysis.

Allotments within PHMA, focusing on those containing riparian areas, including wet meadows, will be prioritized for field checks to help ensure compliance with the terms and conditions of the grazing permits. Field checks can include monitoring for actual use, utilization, and use supervision.

Action LG-1.6: In PHMA, conduct land health assessments that include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Local objectives will be developed at the field office level in partnership with North Dakota Game and Fish Department and USFWS, and incorporated into AMPs or livestock grazing permits as appropriate incorporating best available science.

Action LG-1.7: At the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will 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 or fire breaks. This does not apply to or impact grazing preference transfers, which are addressed in 43 CFR 4110.2-3.

Implementation Management Action after Land Health Evaluations

Action LG-1.8: Develop specific objectives to conserve, enhance or restore PHMA based on ecological site descriptions (ESD) and assessments (including within wetlands and riparian areas). If an effective grazing system that meets GRSG habitat requirements is not already in place, analyze at least one alternative that conserves, restores or enhances GRSG habitat in the NEPA document prepared for the permit renewal.

Action LG-1.9: In PHMA, manage for vegetation composition and structure consistent with GRSG seasonal habitat objectives. ESDs can help determine whether or not the GRSG seasonal habitat objectives are consistent with the ecological site potential within the reference state. GRSG seasonal habitat objectives and ecological site potential within reference states are not always going to be the same.

Action LG-1.10: In PHMA, implement management actions (grazing decisions, AMP/Conservation Plan development, or other agreements) to modify grazing management to meet State of North Dakota seasonal GRSG habitat requirements, where allotment evaluations indicate land health assessments are not being met due to livestock. Consider singly, or in combination, changes in:

1. Season or timing of use;
2. Numbers of livestock (includes temporary non-use or livestock removal);
3. Distribution of livestock use;
4. Intensity of use; and
5. Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas, and goats).

Action LG-1.11: During drought periods, prioritize evaluating effects of the drought in PHMA relative to their needs for food and cover. Management will continue to be in accordance with the Montana-Dakotas Drought Policy (see Appendix H, Drought Policy, in North Dakota Greater Sage-Grouse Proposed RMPA/Final EIS).

Riparian Areas and Wet Meadows

Action LG-1.12: Where riparian and wetland areas are already meeting standards, they will be maintained in that condition or better. Where a site's capability is less than proper functioning condition (PFC), BLM will manage to achieve or move towards capability.

- Within PHMA and GHMA, manage wet meadows to maintain a component of perennial forbs with diverse species richness relative to site potential (e.g., reference state) to facilitate brood rearing.

Action LG-1.13: In PHMA, where riparian areas and wet meadows meet PFC, strive to move towards GRSG habitat objectives within capabilities of the reference state vegetation relative to the ESD.

- Example: Within PHMA reduce, where necessary, hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques, seasonal use, or livestock distribution changes where necessary to reduce pressure on riparian or wet meadow vegetation used by GRSG in the hot season (summer).

Action LG-1.14: Authorize new water development for diversion from spring or seep source only when PHMA will be maintained or benefit from the development. This includes developing new water sources for livestock as part of an AMP/Conservation Plan to improve GRSG habitat.

Action LG-1.15: Analyze springs, seeps and associated pipelines at time of grazing lease renewal to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within PHMA. Make modifications where necessary, considering impacts on other water uses when such considerations are neutral or beneficial to GRSG.

Treatments to Increase Forage for Livestock/Wild Ungulates

Action LG-1.16: In PHMA, allow treatments that conserve, enhance or restore GRSG habitat as well as other priority species habitat (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve GRSG habitat).

Action LG-1.17: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to PHMA to determine if they should be restored to sagebrush or habitat of higher quality for GRSG. If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving or enhancing the rest of the PHMA, then no restoration will be necessary. Assess the compatibility of these seedings for GRSG habitat or as a component of a grazing system during the land health assessments.

Structural Range Improvement and Livestock Management Tools

Action LG-1.18: In PHMA, design any new structural range improvements and location of supplements (salt or protein blocks) to conserve, enhance, or restore GRSG habitat through an improved grazing management system relative to GRSG objectives. Structural range improvements, in this context, include but are not limited to: cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments. Potential for invasive species establishment or increase following construction must be considered in the project planning process and monitored and treated post-construction.

Action LG-1.19: When developing or modifying water developments in PHMA, use applicable RDFs (**Appendix C**) to mitigate potential impacts from West Nile virus.

Action LG-1.20: In PHMA, evaluate existing structural range improvements and location of supplements (salt or protein blocks) during grazing lease renewal process to make sure they conserve, enhance or restore GRSG habitat.

- To reduce outright GRSG strikes and mortality, remove, modify or mark fences in high risk areas within PHMA based on proximity to lek, lek size, and topography.
- Monitor for, and treat invasive species associated with existing range improvements.

2.2.5 Mineral Resources (MR)

Fluid Minerals

Objective MR-1.1: Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA and GHMA. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMA and GHMA, and subject to applicable stipulations for the conservation of GRSG, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG. The implementation of these priorities will be subject to valid existing rights and any applicable law or regulation, including, but not limited to, 30 US Code 226(p) and 43 CFR, Part 3162.3-1(h).

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, minimize, and apply compensatory mitigation for 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 application for permit to drill 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.

Management Actions

Unleased Federal Fluid Mineral Estate

Action MR-1.1: Open to oil and gas leasing and development; however, surface occupancy and use will be prohibited within PHMA (NSO). Upon expiration or termination of existing leases, apply NSO. See **Figure 2-4**, North Dakota Fluid Minerals (Oil, Gas, and Geothermal) (**Appendix A**).

No waivers or modifications to a fluid mineral lease no-surface-occupancy stipulation will be granted.

The BLM Authorized Officer may grant an exception to a fluid mineral lease no-surface-occupancy stipulation only where the proposed action:

i. Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or,

ii. Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG.

Exceptions based on conservation gain (ii) may only be considered in (a) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMPA. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Any exceptions to this lease stipulation may be approved by the BLM Authorized Officer only with the concurrence of the State Director. The BLM Authorized Officer may not grant an exception unless the state wildlife agency (NDGF), the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other GRSG expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and NDGF Director for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publically available at least quarterly.

Action MR-1.2: In GHMA, surface occupancy and use will be subject to special operating constraints (CSU) (**Appendix G**, Oil and Gas Stipulations).

Action MR-1.3: Allow geophysical exploration within PHMA to obtain exploratory information for areas outside of and adjacent to PHMA.

Action MR-1.4: Allow geophysical operations by existing roads and trails, or helicopter-portable drilling methods, and in accordance with seasonal timing restrictions and/or other restrictions that may apply.

Leased Federal Fluid Mineral Estate

Action MR-1.5: During implementation level review and decisions (e.g., approval of an application for permit to drill and Sundry Notice) and upon completion of the environmental record of review (43 CFR, Part 3162.5), include appropriate documentation of compliance with NEPA. In this process evaluate, among other things: (1) Whether the conservation measure is "reasonable" (43 CFR, Part 3101.1-2) with the valid existing rights; and (2) Whether the action is in conformance with the approved ARMPA.

Conservation Measure #1: The following operating constraints will be applied to existing leases as conditions of approval (COAs) in PHMA and GHMA. Exceptions may be granted by the BLM Authorized Officer if an environmental review demonstrates that effects can be mitigated to an acceptable level, habitat for the species is not present in the area, or portions of the area can be occupied without affecting a particular species. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies.

a. Surface disturbing/disruptive activities will prevent or minimize disturbance to GRSG or their habitat. Except as identified above or during emergency situations, activities will not compromise the functionality of the habitat.

b. Manage water developments to reduce the spread of West Nile virus within GRSG habitat areas.

c. Site and/or minimize linear ROW to reduce disturbance to sagebrush habitats.

d. Maximize placement of new utility developments (power lines, pipelines, etc.) and transportation routes in existing ROWs.

e. Power lines will be buried, eliminated, designed or sited in a manner which does not impact GRSG.

f. Placement of other high profile structures, exceeding 10 feet in height, will be eliminated, designed or sited in a manner which does not impact GRSG.

g. Remote monitoring of production facilities must be utilized and all permit applications must contain a plan to reduce the frequency of vehicle use.

h. Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, top-soiling and re-vegetating cut and fill slopes. Utilize native grass species mix which includes sagebrush and forbs.

i. Restore disturbed areas at final reclamation to pre-disturbance conditions or desired plant community. Utilize native grass species mix which includes sagebrush and forbs.

j. Permanent (longer than 2 months) structures which create movement must be designed or sited to minimize impacts on GRSG.

k. As reasonable (43 CFR, Part 3101.1-2), in consideration of valid existing rights, and to achieve a net conservation gain, the BLM will require compensatory mitigation when impacts cannot be adequately avoided and minimized, and residual impacts will result in habitat loss and degradation. Compensatory mitigation actions will align with the recommendations in the Regional Mitigation Strategy (see **Appendix F**), as appropriate. A priority may be given to compensatory mitigation actions in the same PHMA as is being impacted, unless a greater benefit can be achieved elsewhere. Compensatory mitigation will be considered when no feasible options remain to adequately avoid and minimize impacts within and immediately adjacent to the impacted site.

Conservation Measure #2: Make applicable RDFs (**Appendix C**) mandatory as COA within PHMA.

Solid Minerals

Management Actions

Coal

Action MR-1.6: At the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is "unsuitable" for all or certain coal mining methods pursuant to 43 CFR, Part 3461.5. PHMA is essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR, Part 3461.5(o)(1). See **Figure 2-13**, North Dakota Coal (**Appendix A**).

Action MR-1.7: Subsurface mines - Grant no new mining leases unless all surface disturbances (appurtenant facilities) are placed outside of PHMA.

Action MR-1.8: In GHMA, apply minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on important seasonal GRSG habitats. Apply these measures during activity level planning.

- Use additional, effective mitigation to offset impacts as appropriate (determined by local options/needs).

Locatable Minerals

Action MR-1.9: In PHMA, proposed actions under Plan of Operations and Notices will be analyzed on a case-by-case basis in cooperation with the State of North Dakota, and RDFs (**Appendix C**) will be applied to the extent consistent with applicable law. See **Figure 2-5**, North Dakota Locatable Minerals (**Appendix A**).

Mineral Materials

Action MR-1.10: Close PHMA to mineral material sales. See **Figure 2-6**, North Dakota Salable Minerals (Mineral Materials) (**Appendix A**).

Action MR-1.11: In PHMA, restore salable mineral pits no longer in use to meet GRSG habitat conservation objectives.

Note: Although there are no authorized mineral pits in the planning area, any trespass pits found in the planning area will be subject to restoration.

Nonenergy Leasable Minerals

Action MR-1.12: Close PHMA to nonenergy leasable mineral leasing. See **Figure 2-7**, North Dakota Nonenergy Leasables (**Appendix A**). This includes not permitting any new leases to expand an existing mine.

Action MR-1.13: For existing nonenergy leasable mineral leases in PHMA, follow the same RDFs applied to fluid minerals (**Appendix C**), when wells are used for solution mining.

Mineral Split Estate

Action MR-1.14: Where the federal government owns the mineral estate in PHMA and GHMA, and the surface is in non-federal ownership, apply the same stipulations, COAs, and/or conservation measures and RDFs applied if the mineral estate is developed on BLM-administered lands in that management area, to the maximum extent permissible under existing authorities, and in coordination with the landowner.

Action MR-1.15: Where the federal government owns the surface and the mineral estate is in non-federal ownership in PHMA and GHMA, apply appropriate surface use COAs, stipulations, and mineral RDFs through ROW grants or other surface management instruments, to the maximum extent permissible under existing authorities, in coordination with the mineral estate owner/lessee.

2.2.6 Lands and Realty (LR)

Objectives

Objective LR-1.1: Effects of infrastructure projects, including siting, will be minimized using the best available science, updated as monitoring information on current infrastructure projects becomes available.

Management Actions

Rights-of-Way

Action LR-1.1: PHMA will be managed as ROW avoidance area for high-voltage transmission lines (100 kilovolt [kV] and over) and large pipelines (24 inches in width and over). See **Figure 2-10a**, North Dakota Major Rights-of-Way (**Appendix A**).

- Where new ROWs are required, co-locate new ROW within existing ROWs or where it best minimizes impacts on GRSG and GRSG habitat.

Action LR-1.2: PHMA will be managed as ROW avoidance area for minor ROWs (including communication sites and towers). See **Figure 2-10b**, North Dakota Minor Rights-of-Way (**Appendix A**).

Action LR-1.3: Make PHMA exclusion area for new ROW wind and solar energy authorizations. See **Figure 2-8**, North Dakota Wind, and **Figure 2-9**, North Dakota Solar (**Appendix A**).

Action LR-1.4: When addressing ROW authorizations in PHMA identify and evaluate opportunities to remove, bury or modify existing power lines within PHMA.

Action LR-1.5: In PHMA, where existing leases or ROWs have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat.

Action LR-1.6: GHMA will be managed as ROW avoidance area for high-voltage transmission lines (100kV and over) and large pipelines (24 inches in width and over).

Action LR-1.7: Minor ROWs will be allowed in GHMA with appropriate mitigation and conservation measures identified within the terms of the authorization to minimize surface disturbing and disruptive activities.

Action LR-1.8: Make GHMA avoidance area for new wind and solar energy authorizations. See **Figure 2-8** and **Figure 2-9** (**Appendix A**).

Action LR-1.9: Where new ROWs are necessary in GHMA, co-locate new ROWs within existing ROWs where possible.

Action LR-1.10: PHMA will be avoidance areas for leases/land use authorizations, which can be for agricultural, occupancy, or filming. Leases/land use authorizations will be allowed in GHMA with appropriate mitigation and conservation measures identified within the terms of the authorization to minimize surface disturbing and disruptive activities.

Action LR-1.11: Consider the likelihood of development of not-yet-constructed surface-disturbing activities – as defined in Table 2 of the Monitoring Framework (**Appendix D**)—under valid existing rights prior to authorizing new projects in PHMA.

Land Tenure Adjustment

Action LR-1.12: Lands classified as PHMA and GHMA for GRSG will be retained in federal management unless: (1) the BLM can demonstrate that disposal of the lands, including land exchanges, will provide a net conservation gain to GRSG or (2) the BLM can demonstrate that the disposal, including land exchanges, of the lands will have no direct or indirect adverse impact on conservation of GRSG. See **Figure 2-11**, North Dakota Land Tenure (**Appendix A**).

Action LR-1.13: PHMA will be a priority in consideration of land acquisitions. Consider GRSG for all land tenure actions.

Recommend Land Withdrawals

Action LR-1.14: No areas are currently withdrawn from minerals on BLM surface.

Action LR-1.15: In PHMA, do not recommend lands withdrawals (i.e., those not associated with mineral activity) unless the land management is consistent with GRSG conservation measures. (For example, in a proposed withdrawal for a military training range buffer area, manage the buffer area with GRSG conservation measures.)

2.2.7 Recreation (REC)

Management Actions

Action REC-1.1: Only allow Special Recreation Permits that will have neutral or beneficial effects on PHMA.

Action REC-1.2: In PHMA, do not construct new recreation facilities (e.g., campgrounds, trails, trailheads, and staging areas) unless the development will have a net conservation gain to GRSG habitat (such as concentrating recreation, diverting use away from important areas, etc.), or unless the development is required for visitor health and safety or resource protection.

2.2.8 Travel and Transportation (TTM)

Management Actions

Action TTM-1.1: In PHMA and GHMA, limit off-high vehicle (OHV) travel to existing roads, primitive roads, and trails at a minimum, until such time as travel management planning is complete and routes are either designated or closed. See **Figure 2-12**, North Dakota Trails and Travel Management (**Appendix A**).

Action TTM-1.2: In PHMA, travel management will evaluate the need for permanent, or seasonal, road or area closures where vehicle use is causing or will cause adverse effects upon habitat.

Action TTM-1.3: In PHMA and GHMA, complete activity level travel plans within 5 years of the ROD. During activity level planning, where appropriate, designate routes in PHMA and GHMA with current administrative/agency purpose or need to administrative access only.

Action TTM-1.4: In PHMA, limit route construction to realignments of existing designated routes if that realignment has a minimal impact on GRSG habitat, eliminates the need to construct a new road, or

is necessary for motorist safety. Allow new routes/realignments in PHMA and GHMA during site-specific travel planning if it improves GRSG habitat and resource conditions.

Action TTM-1.5: In PHMA, use existing routes, or realignments as described above to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing routes, then build any new route constructed to the absolute minimum standard necessary.

Action TTM-1.6: In PHMA and GHMA, allow no upgrading of existing routes that will change route category (road, primitive road, or trail) or capacity unless the upgrading will have minimal impact on GRSG habitat, is necessary for motorist safety, or eliminates the need to construct a new road.

Action TTM-1.7: When travel management plans are complete, conduct restoration of roads, primitive roads and trails in PHMA and GHMA.

Action TTM-1.8: When reseeding roads, primitive roads and trails in PHMA and GHMA, use appropriate seed mixes and consider the use of transplanted sagebrush.

Action TTM-1.9: In PHMA and GHMA, temporary closures will be considered in accordance with 43 CFR, subpart 8364 (Closures and Restrictions); 43 CFR, subpart 8351 (Designated National Area); 43 CFR, subpart 6302 (Use of Wilderness Areas, Prohibited Acts, and Penalties); 43 CFR, subpart 8341 (Conditions of Use).

Temporary closure or restriction orders under these authorities are enacted at the discretion of the BLM Authorized Officer to resolve management conflicts and protect persons, property, and public lands and resources. Where a BLM Authorized Officer determines that OHVs are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence. (43 CFR, Part 8341.2) A closure or restriction order shall be considered only after other management strategies and alternatives have been explored. The duration of temporary closure or restriction orders shall be limited to 24 months or less; however, certain situations may require longer closures and/or iterative temporary closures. This may include closure of routes or areas.

CHAPTER 3
CONSULTATION, COORDINATION, AND PUBLIC INVOLVEMENT

The BLM land use planning activities are conducted in accordance with NEPA requirements, CEQ regulations, and DOI 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. Public involvement and agency consultation and coordination, which have been at the heart of the planning process leading to this ARMPA, were achieved through *Federal Register* notices, public and informal meetings, individual contacts, media releases, planning bulletins, and the Rocky Mountain Region – National Greater Sage-Grouse Planning Strategy website (http://www.blm.gov/wo/st/en/prog/more/sagegrouse/eastern.html).

3.1 CONSULTATION AND COORDINATION

The BLM collaborated with numerous agencies, municipalities, and tribes throughout the preparation of this ARMPA. Outreach and collaboration with cooperating agencies are described in Section 6.3 of the Proposed RMPA and Final EIS. Four agencies (USFWS, North Dakota Game and Fish Department, Bowman County Commissioners, and Bowman-Slope Conservation District) accepted the offer to participate in the BLM planning process as cooperating agencies. The BLM formally invited the cooperating agencies to participate in developing the alternatives for the RMPA and EIS and to provide data and other information related to their agency responsibilities, goals, mandates, and expertise.

3.1.1 Section 7 Consultation

To comply with Section 7(c) of the ESA, the BLM coordinated and consulted with 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 will have **No Effect** on any threatened or endangered species in the planning area.

3.1.2 Native American Consultation

In accordance with FLPMA and BLM guidance, the BLM engaged in consultation with Native American tribes throughout the planning process. All Native American tribes and organizations with interests in the planning area were contacted by mail and encouraged to be cooperating agencies. Letters were

mailed to the following tribes in December 2011, with follow-up letters mailed in August 2012 (both letters offering to meet with the tribes and inviting them to be cooperating agencies):

- Three Affiliated Tribes—Mandan, Hidatsa, and Arikara
- Spirit Lake Sioux Tribe
- Standing Rock Sioux Tribe
- Turtle Mountain Band of Chippewa
- Lower Sioux Indian Community

These tribes did not respond to BLM requests for consultation on the RMPA, and the BLM received no written comments from tribal agencies during the scoping period. Letters and the Draft EIS were mailed to tribes in November 2013, with follow-up phone calls after the release of the Draft EIS. Letters and the Final EIS/Proposed Plan were also mailed to the tribes listed above in June 2015. None of the tribes raised any concerns during the Draft EIS or Final EIS.

As part of the NEPA scoping and consultation process, and as an opportunity to provide comment in accordance with Section 106 of the NHPA, the BLM notified the North Dakota State Historic Preservation Officer (SHPO) seeking information on concerns with historic properties and land use planning direction included in these ARMPA. The BLM has met its obligations under Section 106 of the NHPA, 54 USC, Section 306108, as outlined in the National PA and the state Protocols.

3.2 PUBLIC INVOLVEMENT

The public involvement process, consultation, and coordination conducted for the RMPA are described in Chapter 6 of the Proposed RMPA and Final EIS. As required by regulation, public scoping meetings were conducted following the publication of the Notice of Intent to prepare an EIS in the *Federal Register* on December 9, 2011.

A Notice of Availability (NOA) for the Draft RMPA/EIS was published in the *Federal Register* on September 27, 2013, initiating a 90-day public comment period. Due to the lapse in appropriations and the resulting federal government shutdown, the Draft RMPA/EIS was not available on the BLM website from October 1 through October 16, 2013. Accordingly, the close of the comment period was extended to January 13, 2014. The BLM held a public comment open house for the Draft RMPA/EIS on October 22, 2013, in Bowman, North Dakota. The comments received on the Draft RMPA and EIS and BLM's responses were summarized in Appendix L of the Proposed RMPA and Final EIS.

The NOA for the Proposed RMPA and Final EIS was published on May 29, 2015, initiating a 30-day public protest period and a 60-day Governor's Consistency review period. The 30-day protest period ended on June 29, 2015. The BLM received seven protest letters for North Dakota.

CHAPTER 4
PLAN IMPLEMENTATION

4.1 IMPLEMENTING THE PLAN

Implementation, after a BLM RMP or RMP amendment is approved, is a continuous and active process. Management decisions can be characterized as *immediate* or *one-time future* decisions.

Immediate decisions—These are the land use planning decisions that go into effect when the ROD is signed. They include goals, objectives, allowable uses, and management direction, such as the allocation of lands as open or closed for salable minerals, lands open with stipulations for oil and gas leasing, and OHV area designations. These decisions require no additional analysis and guide future land management actions and subsequent site-specific implementation decisions in the planning area. Proposals for future actions, such as oil and gas leasing, land adjustments, and other allocation-based actions, will be reviewed against these land use plan decisions to determine if the proposal is in conformance with the plan.

One-time future decisions—These decisions are those that are not implemented until additional decision-making and site-specific analysis is completed, such as the development of travel management plans. Future one-time decisions require additional analysis and decision-making and are prioritized as part of the BLM budget process. Priorities for implementing one-time RMP decisions will be based on the following criteria:

- National BLM management direction
- Available resources

General implementation schedule of one-time decisions—Future decisions discussed in this ARMPA will be implemented over a period of years, depending on budget and staff availability. After issuing the ROD, the BLM will prepare implementation plans that establish tentative time frames for completing one-time decisions identified in the ARMPA. These actions require additional site-specific decision-making and analysis.

This schedule will assist BLM managers and staff in preparing budget requests and in scheduling work. However, the proposed schedule must be considered tentative and will be affected by future funding, nondiscretionary workloads, and cooperation by partners and external publics. Yearly review of the plan

will provide consistent tracking of accomplishments and information that can be used to develop annual budget requests to continue implementation.

4.2 MAINTAINING THE PLAN

The ARMPA can be maintained as necessary to reflect minor changes in data. Plan maintenance is limited to further refining or documenting a previously approved decision incorporated in the plan or for clarifying previously approved decisions.

The BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data and will support new management techniques, best management practices, and scientific principles. Where monitoring shows land use plan actions or best management practices are not effective, plan maintenance or plan amendment may begin, as appropriate. Plan maintenance will be documented in supporting records; plan maintenance does not require formal public involvement, interagency coordination, or the NEPA analysis required for making new land use plan decisions.

4.3 CHANGING THE PLAN

The ARMPA may be changed, should conditions warrant, through a plan amendment or plan revision process. A plan amendment may become necessary if major changes are needed or to consider a proposal or action that is not in conformance with the plan. The results of monitoring, evaluation of new data, or policy changes and changing public needs might also provide a need for a plan amendment. If several areas of the plan become outdated or otherwise obsolete, a plan revision may become necessary. Plan amendments and revisions are accomplished with public input and the appropriate level of environmental analysis conducted according to CEQ procedures for implementing NEPA.

New information may lead to changes in delineated GRSG habitat. New habitat areas, or areas that are no longer habitat, may be identified. This adjustment would typically result in small changes to areas requiring the stipulations or management actions stated in this plan. Modifications to GRSG habitat, based on the best scientific information and in coordination with the NDGF and USFWS, would be updated in the existing data inventory through plan maintenance or plan amendment/revision, as appropriate.

4.4 PLAN EVALUATION AND MONITORING

Plan evaluation is the process by which the plan and monitoring data are reviewed to determine if management goals and objectives are being met and if management direction is sound. Land use plan evaluations determine if decisions are being implemented, if mitigation measures are satisfactory, if there are significant changes in the related plans of other entities, if there is new data of significance to the plan, and if decisions should be modified via amendment or revision. Monitoring data gathered over time is examined and used to draw conclusions on whether management actions are meeting stated objectives, and if not, why not. Conclusions are then used to make recommendations on whether to continue current management or to identify what changes need to be made in management practices to meet objectives.

The BLM will use land use plan evaluations to determine if the decisions in the ARMPA, supported by the accompanying NEPA analysis, are still valid in light of new information and monitoring data. Evaluations will follow the protocols established by the BLM Land Use Planning Handbook (H-1601-1)

or other appropriate guidance in effect at the time the evaluation is initiated. The Monitoring Framework for this ARMPA can be found in **Appendix D**.

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CHAPTER 5
GLOSSARY

Acquisition. Lands can be acquired 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*), this usually describes multiple projects and applies best management practices to meet land use plan objectives. Examples of activity plans are 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.

Administrative access. This is used to describe access for resource management and administrative purposes, such as fire suppression, cadastral surveys, permit compliance, law enforcement and military in the performance of their official duties, or other access needed to administer BLM-administered lands or uses.

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 permittees, lessees, and other affected interests. Livestock grazing is considered in relation to other uses of the range and to renewable resources, such as watersheds, vegetation, and wildlife. An AMP establishes seasons of use, the number of livestock to be permitted, the range improvements needed, and the grazing system.

Amendment. The process for considering or making changes in the terms, conditions, and decisions of approved resource management plans or management framework plans.

Animal unit month. The amount of forage necessary to sustain one cow or its equivalent for one month.

Anthropogenic disturbances. Human-created features that include 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.

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.

Authorized/authorized use. This is an activity (i.e., resource use) occurring on public lands that is both explicitly or implicitly recognized and legalized by law or regulation. This term may refer to those activities on public lands for which the BLM, Forest Service, or other appropriate authority has issued a formal authorization document, such as a livestock grazing lease/permit, right-of-way grant, coal lease, or oil and gas permit to drill. Formally authorized uses typically involve some type of commercial activity, facility placement, or event. These formally authorized uses are often limited in time or area. Unless constrained or bound by statute, regulation, or an approved land use plan decision, legal activities involving public enjoyment and use of public lands, for example, hiking, camping, and hunting, require no formal BLM or Forest Service authorization.

Avoidance/avoidance area. These terms usually address mitigation of some activity (i.e., resource use). Paraphrasing the CEQ regulations (40 CFR, Part 1508.20), avoidance means to circumvent or bypass an impact altogether by not taking a certain action or parts of an action. Therefore, avoidance does not necessarily prohibit a proposed activity, but it may require the relocation of an action, or the total redesign of an action to eliminate any potential impacts resulting from it. Also see the definition of *right-of-way avoidance area.*

Baseline. The preexisting condition of a defined area or resource that can be quantified by an appropriate measurement. 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.

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.

Biologically significant unit. Delineation of GRSG habitat based on GRSG interactions between population management units to represent local GRSG population habitat and use areas within the subregion.

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, Section 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.

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

Chemical vegetation treatment. Application of herbicides to control invasive species/noxious weeds 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.

Closed area. This is an area where off-road vehicle use is prohibited. Use of off-road vehicles in closed areas may be allowed for certain reasons but 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 cooperating agencies.

Communication site. Sites that include broadcast-type uses, such as television, AM/FM radio, cable television, and broadcast translator, and non-broadcast uses, such as commercial or private mobile radio service, cellular telephone, microwave, local exchange network, and passive reflectors.

Condition class (fire regime). This is 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, insects, or disease, or other management activities.

Conformance. This requires that a proposed action be specifically provided for in the land use plan or, if not specifically mentioned, that it be clearly consistent with the goals, objectives, or standards of the approved land use plan.

Conservation measures. Measures to conserve, enhance, or restore GRSG habitat by reducing, eliminating, or minimizing threats.

Conservation plan. The recorded decisions of landowners or operators, cooperating with a conservation district, on how the landowners or operators plan, within practical limits, to use their 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 threat. Conservation strategies are generally developed for species of plants and animals that are designated as BLM sensitive species or that have been determined by the USFWS or National Oceanographic and Atmospheric Administration-Fisheries to be federal candidates under the ESA.

Controlled surface use. This 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, such as truck-mounted drilling and geophysical exploration equipment off designated routes, and construction of wells 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 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. This 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, established by NEPA. It reviews federal programs to analyze and interpret environmental trends and information.

Crucial wildlife habitat. The environment that is essential to plant or animal biodiversity and conservation at the landscape level. Crucial habitats include 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 are archaeological, historical, or architectural sites, structures, or places with important public and scientific uses and locations of traditional cultural or religious importance to specified social 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 the BLM administers.

Deferred/deferred use. To set aside or postpone a particular resource use or activity 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 time frame of associated serial actions; for example, 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 are missing components, such as perennial forbs or cool season grasses, weed infestations, or key species, such as sagebrush or cottonwoods trees, not regenerating.

Designated roads and trails. Specific roads and trails identified by the BLM 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. These are caused by an action or implementation of an alternative and occur at the same time and place.

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

Disruptive activities. Those public land resource uses and activities that are likely to alter the behavior, to displace, or to excessively stress animal or human populations at a specific location or time. In this context, disruptive activities refers to those actions that alter behavior or displace 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, or the nearness of people and their activities. The term is commonly used in conjunction with protecting wildlife during crucial life stages, such as breeding, nesting, and birthing, although it could apply to any resource value on public lands. The use of this land use restriction is not intended to prohibit all activity or authorized uses.

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

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

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

Emergency stabilization. Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life and 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 wildland fire.

Endangered species. Any species that is in danger of extinction throughout all or a significant portion of its range. Under the Endangered Species Act in the United States, endangered status is more protective than threatened status. Designation as endangered (or threatened) is determined by the USFWS, as directed by the Endangered Species Act (16 USC. Sections 1531-1544).

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 ESA is administered by two federal agencies, the USFWS and the National Oceanic and Atmospheric Administration. Its purpose is to protect species and also the ecosystems they depend on (16 USC, Sections 1531-1544).

Enhance. The improvement of habitat by increasing missing or modifying unsatisfactory components or attributes of the plant community to meet GRSG objectives.

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

Environmental impact statement. A detailed statement prepared by the responsible official in which a major federal action that significantly affects the quality of the human environment is described, alternatives to the proposed action are provided, and effects are analyzed.

Evaluation (plan evaluation). The process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and NEPA 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 on the public lands where a certain activity is prohibited to ensure protection of other resource values on the site. The term is frequently used in reference to lands/realty actions and proposals, such as rights-of-way, but it is not unique to lands and realty program activities. This restriction is functionally analogous to the phrase "no surface occupancy" used by the oil and gas program and is applied as an absolute condition to those affected activities. The less restrictive analogous term is avoidance area. Also see the *right-of-way exclusion area* definition.

Existing routes. These are defined as those routes on the ground that clearly show prior use to the extent that a clear path is visible with no vegetation on it, or in some cases there is little vegetation in the center of the travel path. A single set of vehicle tracks does not make an existing route.

Exploration. Active drilling and geophysical operations to determine the presence of the mineral resource or to determine the extent of the reservoir or mineral deposit.

Facility, energy or mining. Human-constructed assets designed and created to serve a particular function and to afford a particular convenience or service that is affixed to a specific locations, such as oil and gas well pads and associated infrastructure.

Federal Land Policy and Management Act of 1976. 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 United States and administered by the BLM. Federal mineral estate under BLM jurisdiction is composed of mineral estate underlying BLM-administered lands, privately owned lands, and state-owned lands.

Fire Regime Condition Classification System (FRCCS). This 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. These are Oil, gas, coal bed natural gas, and geothermal resources.

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

General sage-grouse habitat. This is seasonally or year-round occupied habitat outside of priority habitat. The BLM has identified these areas 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. The activities undertaken 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 it is not quantifiable and may not have established time frames for achievement.

Grazing preference. Grazing 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), of their priority (preference) to use a livestock forage allocation on public land as well as their permission to use this forage. Relinquishments do not require the BLM's consent or approval. The BLM's receipt of a relinquishment is not a decision to close areas to livestock grazing.

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. It includes developing pastures, utilization levels, grazing rotations, timing and duration of use periods, and necessary range improvements.

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.

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

Implementation decisions. Decisions that take action to implement land use planning; generally they are appealable to the 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. It includes both activity plans and project plans.

Indicators. Factors that describe resource conditions and changes; they can help the BLM determine trends over time.

Indirect impacts. These 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 looks at all elements of the ranching operations, including strategic and tactical planning, rather than approaching planning as several separate enterprises.

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

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 FLPMA; 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; however, they are not appealable to Interior Board of Land Appeals.

Late brood-rearing area. This habitat includes mesic sagebrush and mixed shrub communities, wet meadows, and riparian habitats, as well as some agricultural lands, such as 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 nonenergy minerals, such as phosphate, sodium, potassium, and sulfur. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

Lease. Section 302 of the Federal Land Policy and Management Act of 1976 provides the BLM's authority to issue leases for the use, occupancy, and development of public lands. Leases are issued for purposes such as a commercial filming, advertising displays, commercial or noncommercial croplands, apiaries, livestock holding or feeding areas not related to grazing permits and leases, native or introduced species harvesting, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, ski resorts, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and non-irrigation 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 next 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 fewer 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 1.5 miles of each other and between which male GRSG 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).
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> **Active lek.** Any lek that has been attended by male GRSG 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 an absence of GRSG 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 to May 7 or other appropriate date, based on local conditions); there must be no precipitation and light or no wind, and they must be conducted a half-hour before sunrise to one hour after sunrise. Alternatively, designation of an inactive lek requires 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, or feathers) of strutting activity. Data collected by aerial surveys should not be used to designate inactive status because 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 GRSG breeding.

Abandoned lek. A lek in otherwise suitable habitat that has not been active during 10 consecutive years. To be designated abandoned, a lek must be inactive (see above) in at least four nonconsecutive strutting seasons spanning the 10 years. A suspected abandoned lek should be surveyed at least once every 10 years to determine whether it has been reoccupied.

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

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

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

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.

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, mill site, 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 fundamental change to the provisions of a lease stipulation, either temporarily or for the term of the lease. A modification may include an exemption from or alteration of a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria 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 jeeps, all-terrain vehicles (such as four-wheelers and three-wheelers), trail motorcycles or dirt bikes, and aircraft.

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

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

Native vegetation. Plant species that were found here before Euro-American contact 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 that existed prior to Euro-American contact and shaped vegetation composition and structure.

Net conservation gain. The intent of the North Dakota Greater Sage-Grouse Proposed Plan Amendment is to provide a net conservation gain to GRSG. The BLM would 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 required when the BLM undertakes management actions and, consistent with valid existing rights and applicable law, when it authorizes third-party actions that result in habitat loss and degradation within priority habitat (core population areas and core population connectivity corridors). Net conservation gain is achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.

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

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, such as truck-mounted drilling and geophysical exploration equipment off designated routes and construction of wells 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 United States.

Objective (BLM). A description of a desired outcome for a resource. Objectives can be quantified and measured and, where possible, have established time frames for achievement.

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. The term excludes any non-amphibious registered motorboat; any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; any vehicle whose use is expressly authorized by the BLM Authorized Officer or otherwise officially approved; vehicles in official use; and any combat or combat support vehicle when used for national defense emergencies (43 CFR, Part 8340.0-5).

Open. Generally denotes an area that is available for a particular use or uses. Refers 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.

Permitted use. The forage allocated by or under the guidance of an applicable land use plan for livestock grazing in an allotment under a permit or lease and expressed in AUMs (43 CFR, Part 4100.0-5; from H-4180-1, BLM Rangeland Health Standards Manual).

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

Plan of operations. This is required for all mining activity exploration greater than five 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. It does not need to be on a particular form but must address the information required by 43 CFR, Part 3809.401(b).

Planning area. This is the geographical area for which GRSG management plan amendments are developed and maintained. The North Dakota Greater Sage-Grouse RMPA/EIS planning area boundary defines the area assessed in this ARMPA. The planning area encompasses 963,017 acres in Bowman, Slope, and Golden Valley Counties in southwestern North Dakota. The BLM administers 33,030 acres (about 3.4 percent) of the planning area and 396,053 acres of federal mineral estate.

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 the National Environmental Policy Act requirements (where applicable) have been met prior to ignition.

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

Priority sage-grouse habitat. This pertains to areas that have been identified as having the highest conservation value to maintaining sustainable GRSG populations. These areas would include breeding,

late brood-rearing, and winter concentration areas, and the BLM has identified them in coordination with respective state wildlife agencies.

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

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

Range improvement. Any activity, structure, or program on or relating to rangelands that 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 structures, treatment projects, and use of mechanical means to accomplish the desired results.

Range improvement project. An authorized physical modification or treatment that 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 structures, treatment projects and use of mechanical devices, or modifications achieved through mechanical means.

Reasonably foreseeable development scenario (RFD). 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 predetermined objectives or to make it acceptable for certain defined resources, such as wildlife habitat, grazing, or ecosystem function.

Reference state. The condition 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. It usually includes what is often referred to as the potential natural plant community.

Rehabilitate. Returning disturbed land 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 GRSG habitat. They 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 location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects,

for example when a resource is not present on a given site, or may require slight variations, such as when it involves 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 or activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project or activity; for example, when it is 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, a state-implemented conservation measure, or a plan-level protection 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.

Reserve common allotment. An area that is designated in the land use plan as available for livestock grazing but reserved 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 an agency apply temporary rest from grazing where vegetation treatments 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 and 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 GRSG. The short-term goals may be to restore the landform, soils, and hydrology and to 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 or spatial constraints, or certain authorizations.

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

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

Right-of-way (ROW). Public lands authorized to be used or occupied for specific purposes, in accordance with a ROW authorization, which are in the public interest and which require ROWs over, on, under, or through such lands.

ROW avoidance area. An area identified through resource management planning to be avoided; it may be available for ROW location with special stipulations.

ROW 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 are lands along 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.

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.

Sale (public land). A method of land disposal, in accordance with Section 203 of the Federal Land Policy and Management Act, whereby the United States 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 and must be identified in the resource management plan. Any lands to be disposed of by sale that are not identified in the current resource management plan, or that meet the disposal criteria identified in the resource management plan, require a plan amendment before a sale can occur.

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. 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 an alternative.

Special Recreation Permit (SRP). This is an authorization that allows for recreational uses of public lands and related waters. The BLM issues it as a means to control visitor use, to protect recreational and natural resources, and to 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 those listed, candidate, or proposed for listing under the Endangered Species Act and those 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 sensitive by a BLM State Director. All federally listed candidate species, proposed species, and delisted species in the five years following delisting are conserved as BLM sensitive species. Forest Service special status species are federally listed threatened and endangered species, designated by the USFWS under the ESA, sensitive species, designated by the Regional Forester with each Forest Service region, and management indicator species, designated for each forest unit within the individual forest and grassland plans during the planning process.

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). Standards are 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).

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 Greater Sage-Grouse use.

- 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, or soil exposure to erosive processes.
- Short-term removal occurs when vegetation is removed in small areas but is restored to suitable habitat within less than five years of disturbance, such as a successfully reclaimed pipeline, drill hole, or pit.
- Suitable habitat is rendered unusable due to numerous anthropogenic disturbances.

- Anthropogenic surface disturbances are those meeting the above definitions and that result from human activities.

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

Surface uses. These are all the various activities that may be present on the surface or near-surface, such as pipelines, of the public lands. It does not refer to those subterranean activities, such as underground mining, occurring on the public lands or federal mineral estate. When administered as a use restriction, such as no surface use, this phrase prohibits all but specified resource uses and activities in a certain area to protect particular sensitive resource values and property. This designation typically applies to small acreage sensitive resource sites, such as plant community study exclosure, or administrative sites, such as 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.

Temporary/temporary use. A relative term that must be considered in the context of the resource values affected and the nature of the resource uses/activities taking place. Generally, a temporary activity is considered to be one that is not fixed in place and is of short duration.

Threatened species. Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Under the Endangered Species Act, threatened is the lesser protected of the two categories, threatened and endangered. It is determined by the USFWS as directed by the Endangered Species Act (16 USC, Sections 1531-1544).

Timber. Standing trees, downed trees, or logs that 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, such as truck-mounted drilling and geophysical exploration equipment off designated routes, construction of wells 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 are not allowed. Intensive maintenance, such as work overs on wells, is not permitted. TLs can overlap spatially with NSO and CSU, as well as with areas that have no other restrictions.

Trail. A linear route managed for human power, such as hiking or bicycling, stock (such as 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.

Transfer of grazing preference. The BLM's approval of an application to transfer grazing preference from one party to another or from one base property to another, or both. Grazing preference means a superior or priority position against others for the purposes of receiving a grazing permit or lease. This priority is attached to base property owned or controlled by the permittee or lessee.

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 and transportation management (TTM). This is proactive interdisciplinary planning; it is on-the-ground management and administration of travel networks (both motorized and nonmotorized) to ensure that 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 variety of uses. These include recreational, traditional, casual, agricultural, commercial, educational, and landing strip uses.

Trespass. Any unauthorized use of public land.

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

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 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 treatments. Management practices that 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 on and named after the apparent dominant plant species.

WAFWA management zone. Delineation of GRSG management zones that were determined by GRSG populations and subpopulations identified within seven floristic provinces (Connelly et al. 2004). Floristic provinces reflect ecological and biological issues and similarities, not political boundaries. WAFWA management zones will be used to identify and address cross-state issues, such as regional mitigation and adaptive management monitoring response, through WAFWA Management Zone GRSG

Conservation Teams (Teams). These Teams will convene and respond to issues at the appropriate scale, and will utilize existing coordination and management structures to the extent possible.

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 GRSG.

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).

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, as follows:

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

Wildland fire use. This is a term that is no longer used; these fires are now included in the definition of wildfire.

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 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.

CHAPTER 6
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Appendices

Appendix A

Approved RMP Amendment Maps

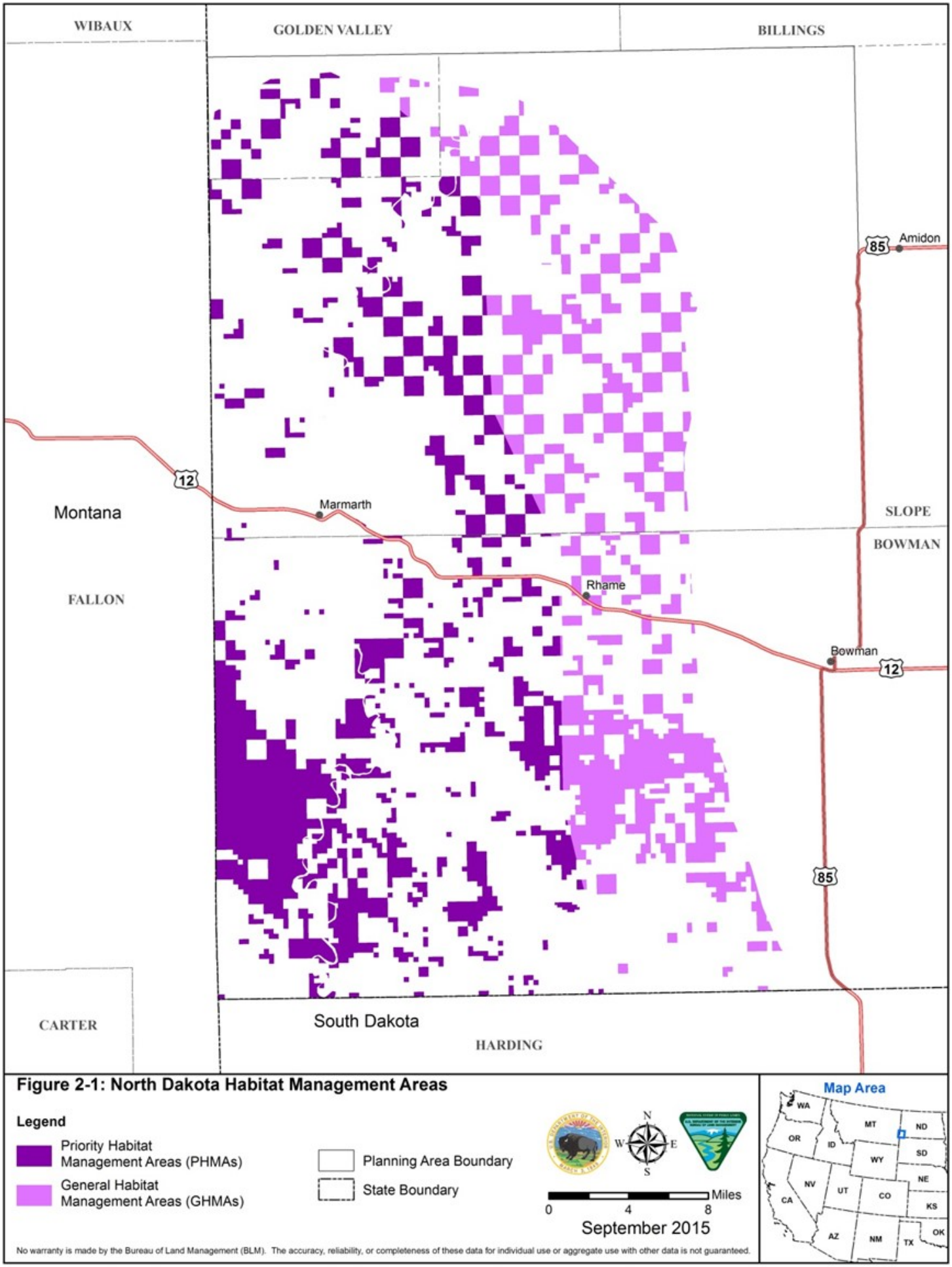
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Figure 2-1: North Dakota Habitat Management Areas
Legend
Priority Habitat Management Areas (PHMAs)
General Habitat Management Areas (GHMAs)
Planning Area Boundary
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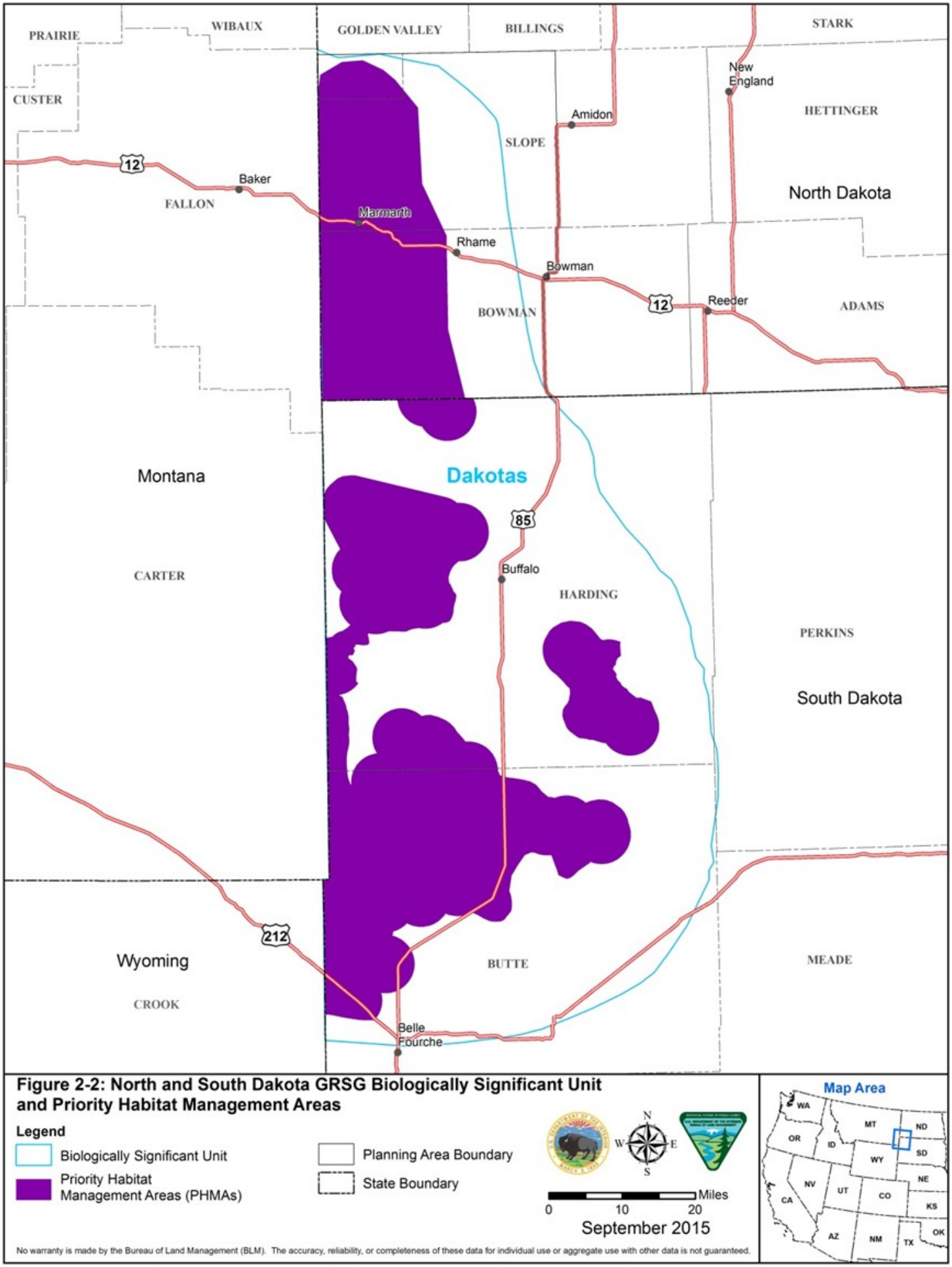
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ADAMS
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CARTER
Buffalo
HARDING
PERKINS
South Dakota
212
Wyoming
BUTTE
MEADE
CROOK
Belle Fourche
Figure 2-2: North and South Dakota GRSG Biologically Significant Unit and Priority Habitat Management Areas
Legend
Biologically Significant Unit
Priority Habitat Management Areas (PHMAs)
Planning Area Boundary
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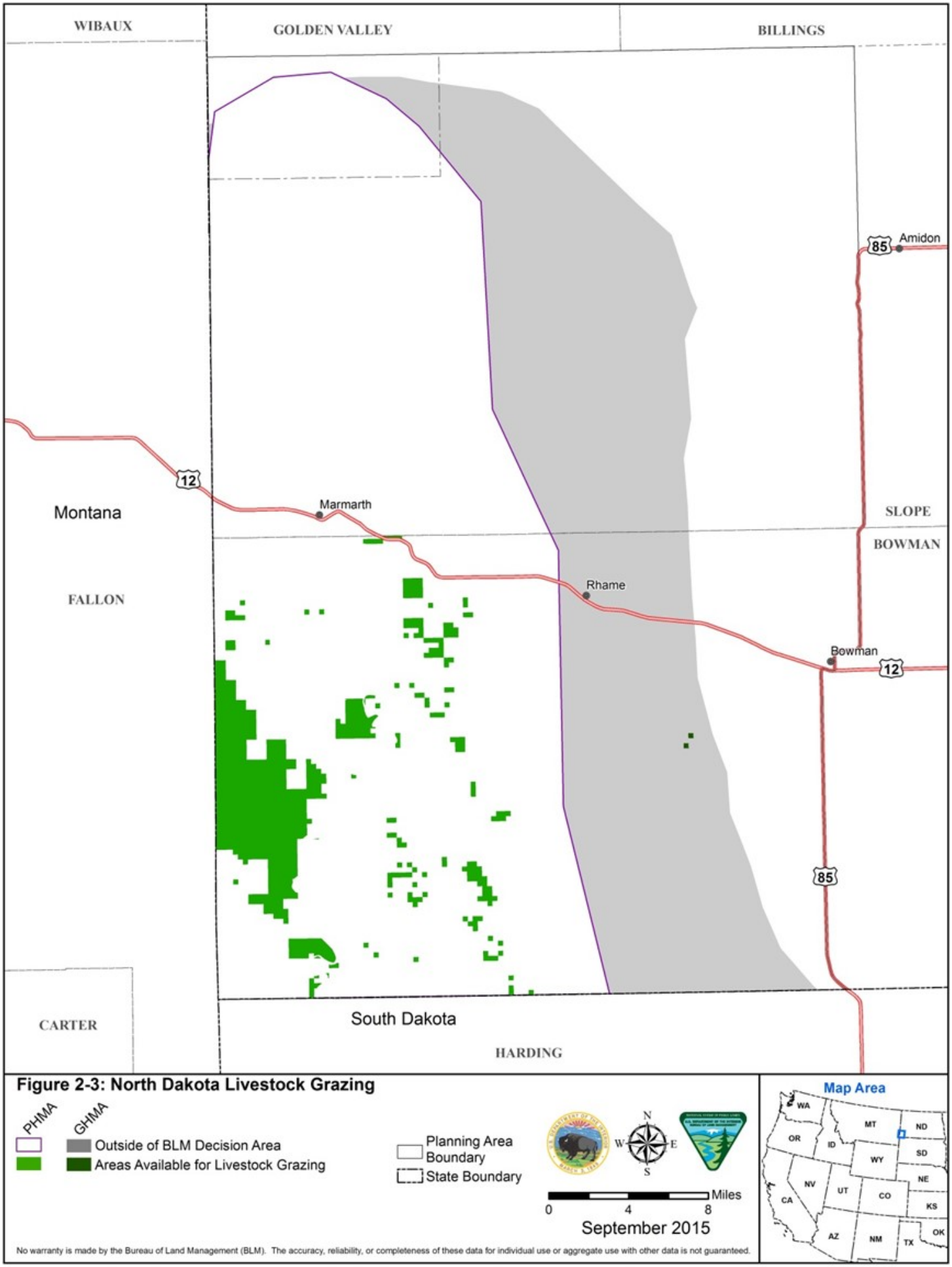
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Figure 2-3: North Dakota Livestock Grazing
PHMA
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Outside of BLM Decision Area
Areas Available for Livestock Grazing
Planning Area Boundary
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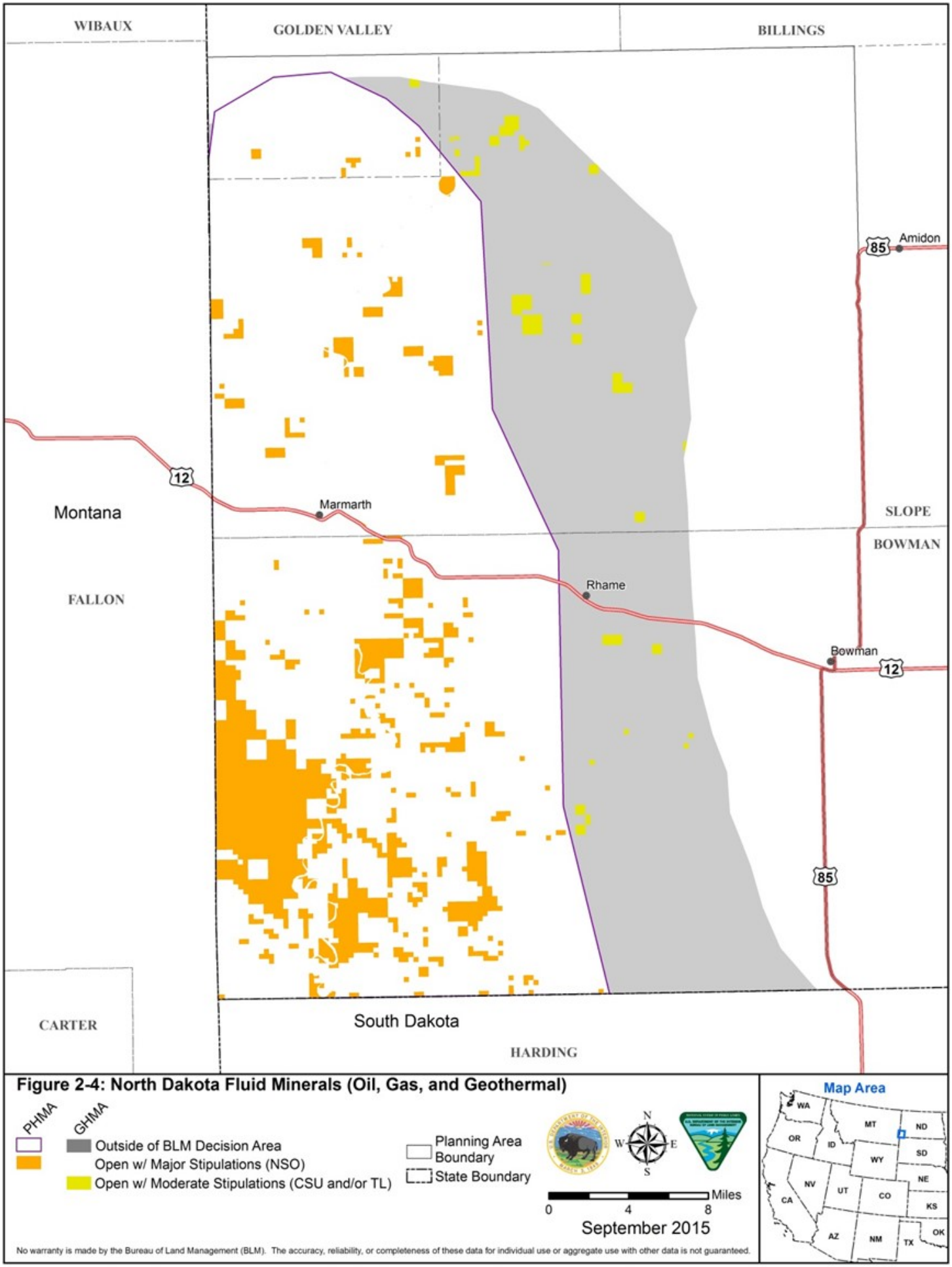
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Figure 2-4: North Dakota Fluid Minerals (Oil, Gas, and Geothermal)
PHMA
GHMA
Outside of BLM Decision Area
Open w/ Major Stipulations (NSO)
Open w/ Moderate Stipulations (CSU and/or TL)
Planning Area Boundary
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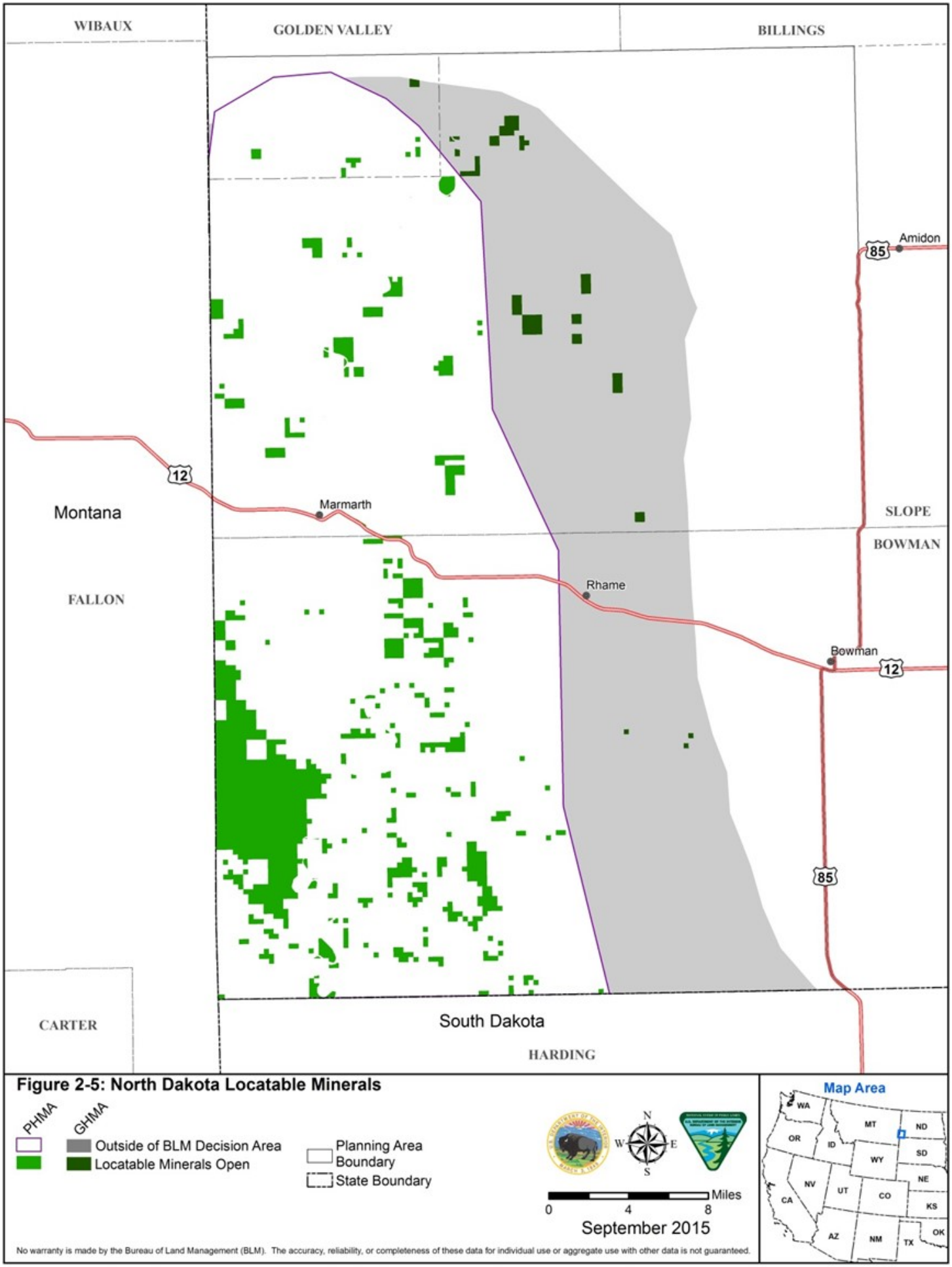
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Figure 2-5: North Dakota Locatable Minerals
PHMA
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Outside of BLM Decision Area
Locatable Minerals Open
Planning Area Boundary
State Boundary
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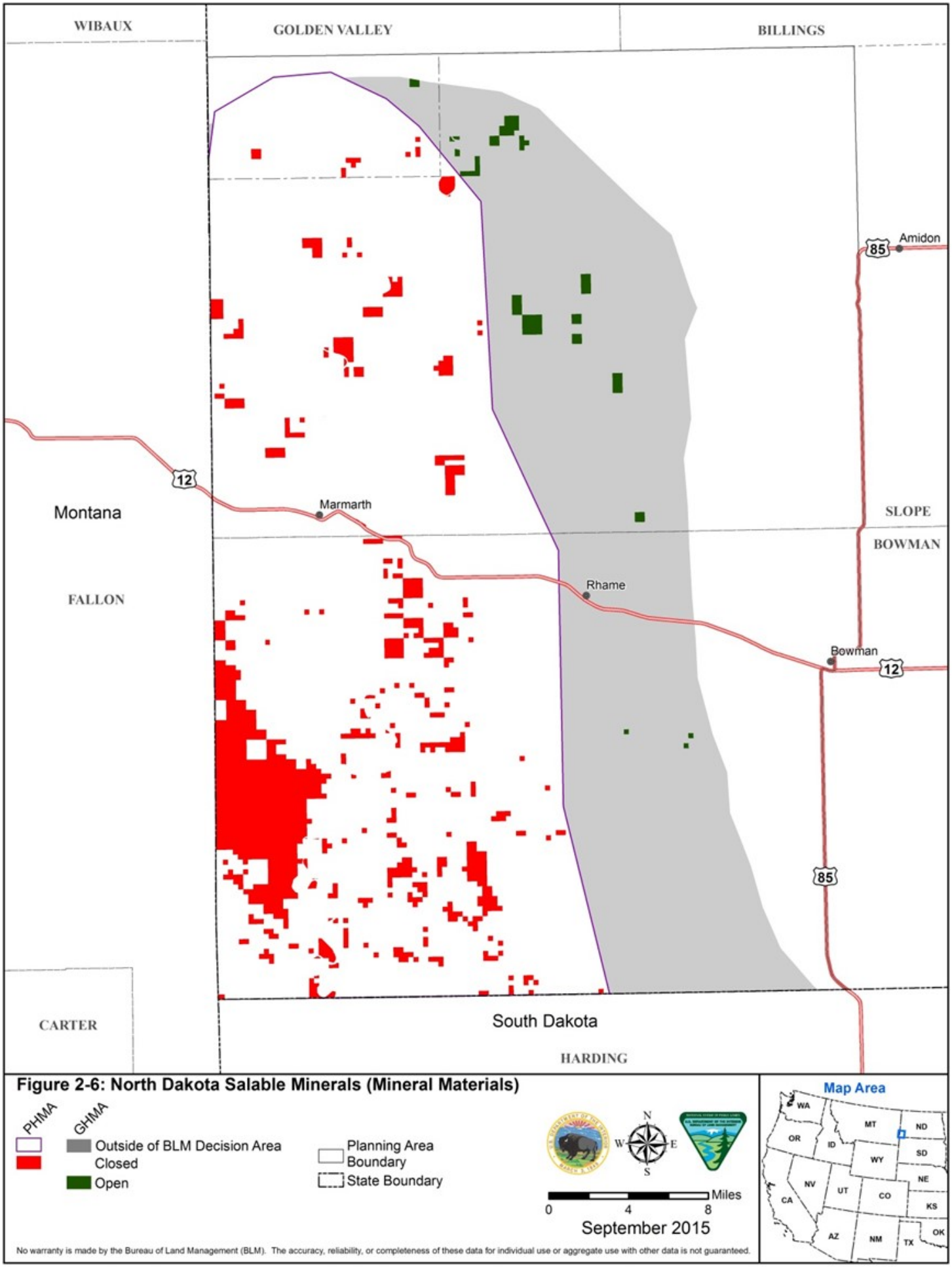
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Figure 2-6: North Dakota Salable Minerals (Mineral Materials)
PHMA
GHMA
Outside of BLM Decision Area
Closed
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Planning Area Boundary
State Boundary
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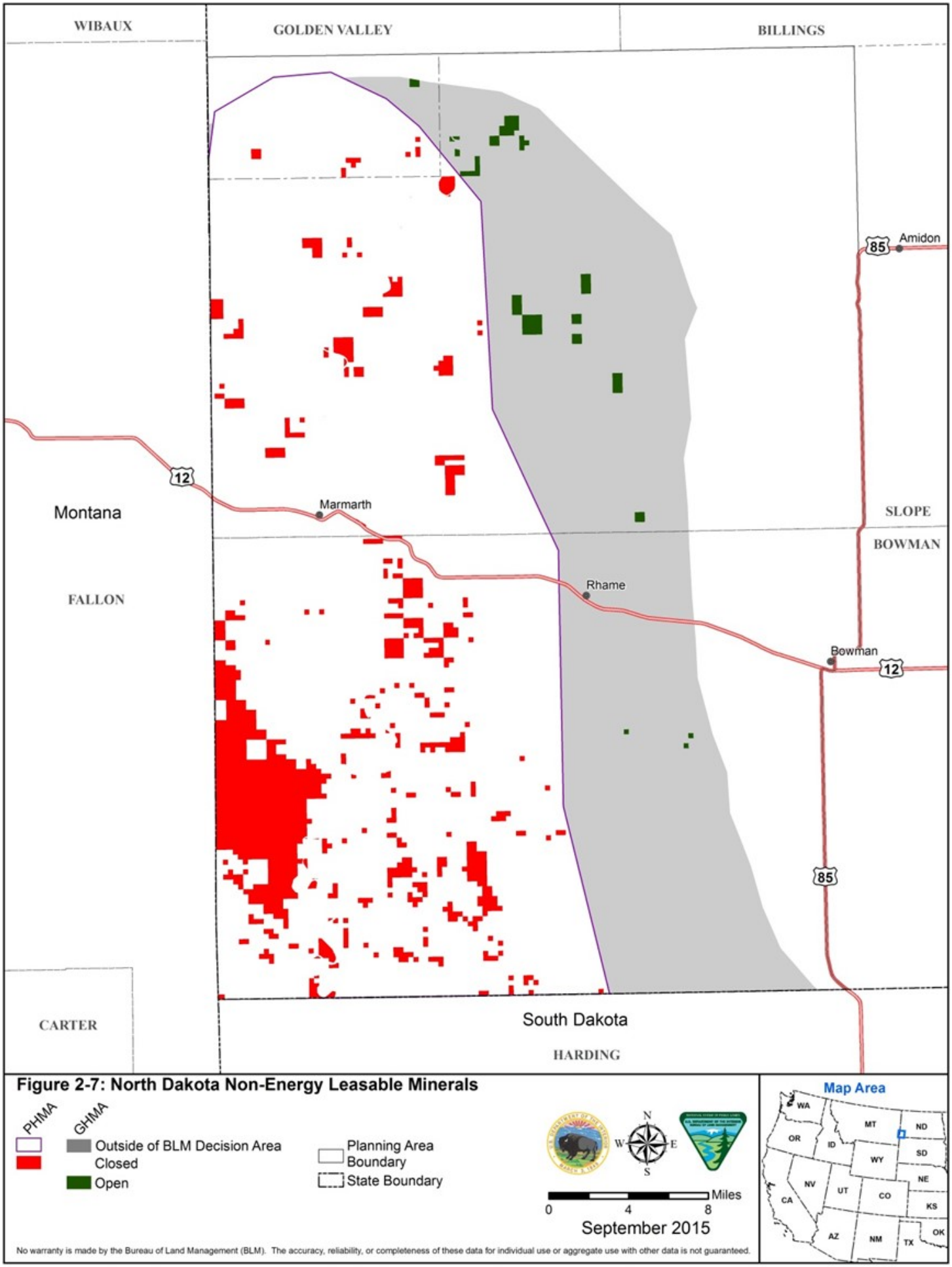
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Figure 2-7: North Dakota Non-Energy Leasable Minerals
PHMA
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Outside of BLM Decision Area
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Planning Area Boundary
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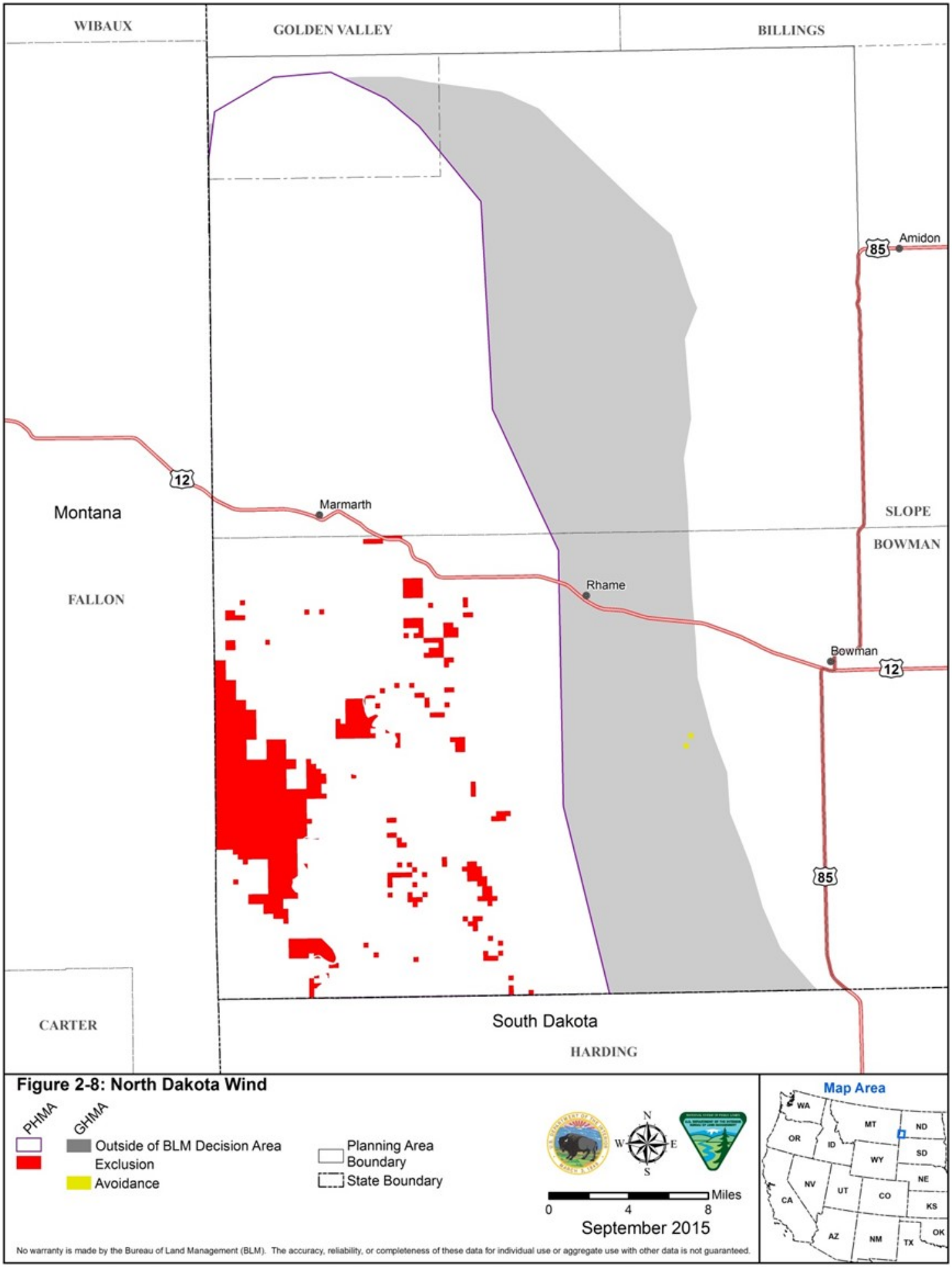
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Figure 2-8: North Dakota Wind
PHMA
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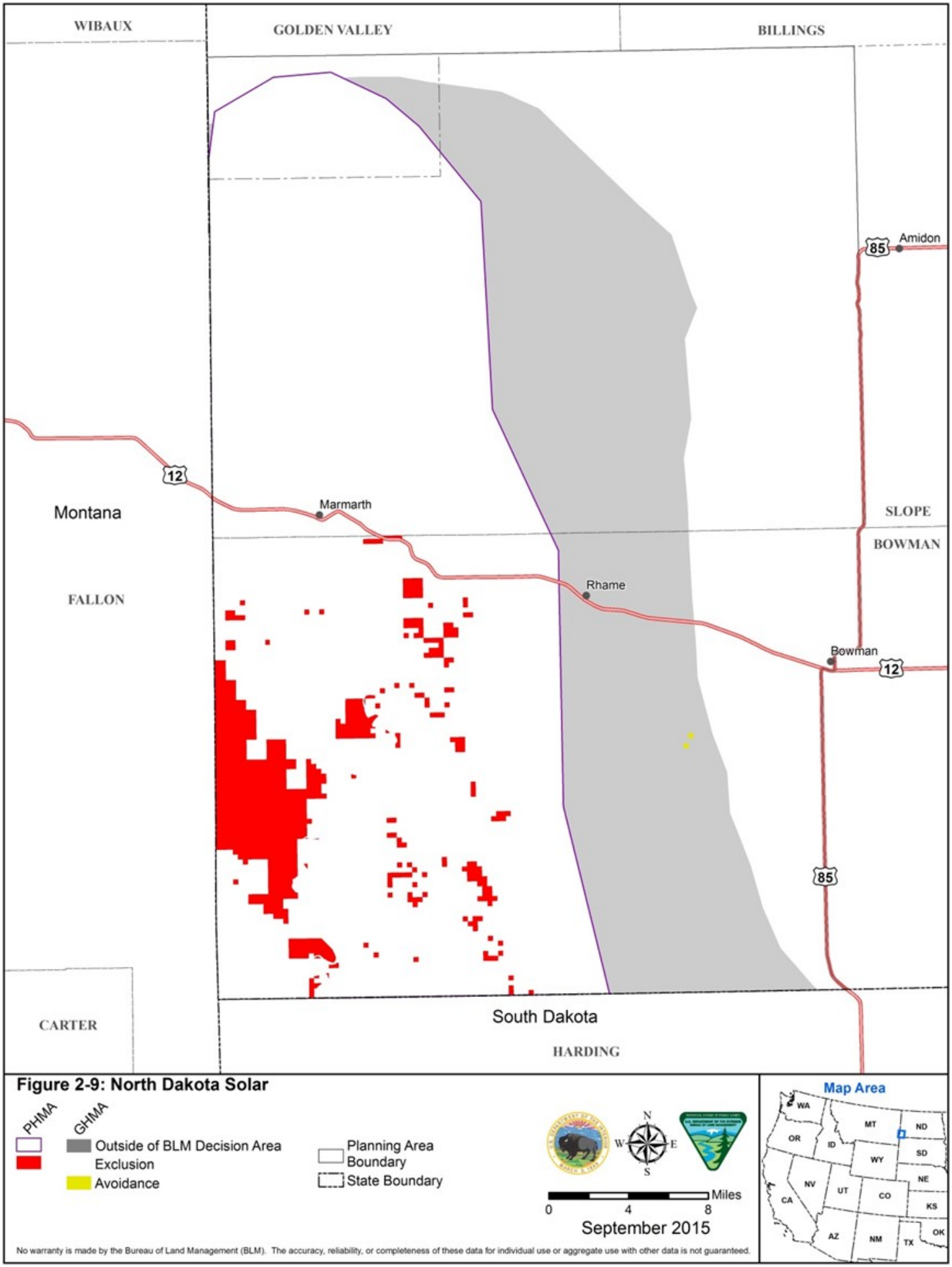
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Figure 2-9: North Dakota Solar
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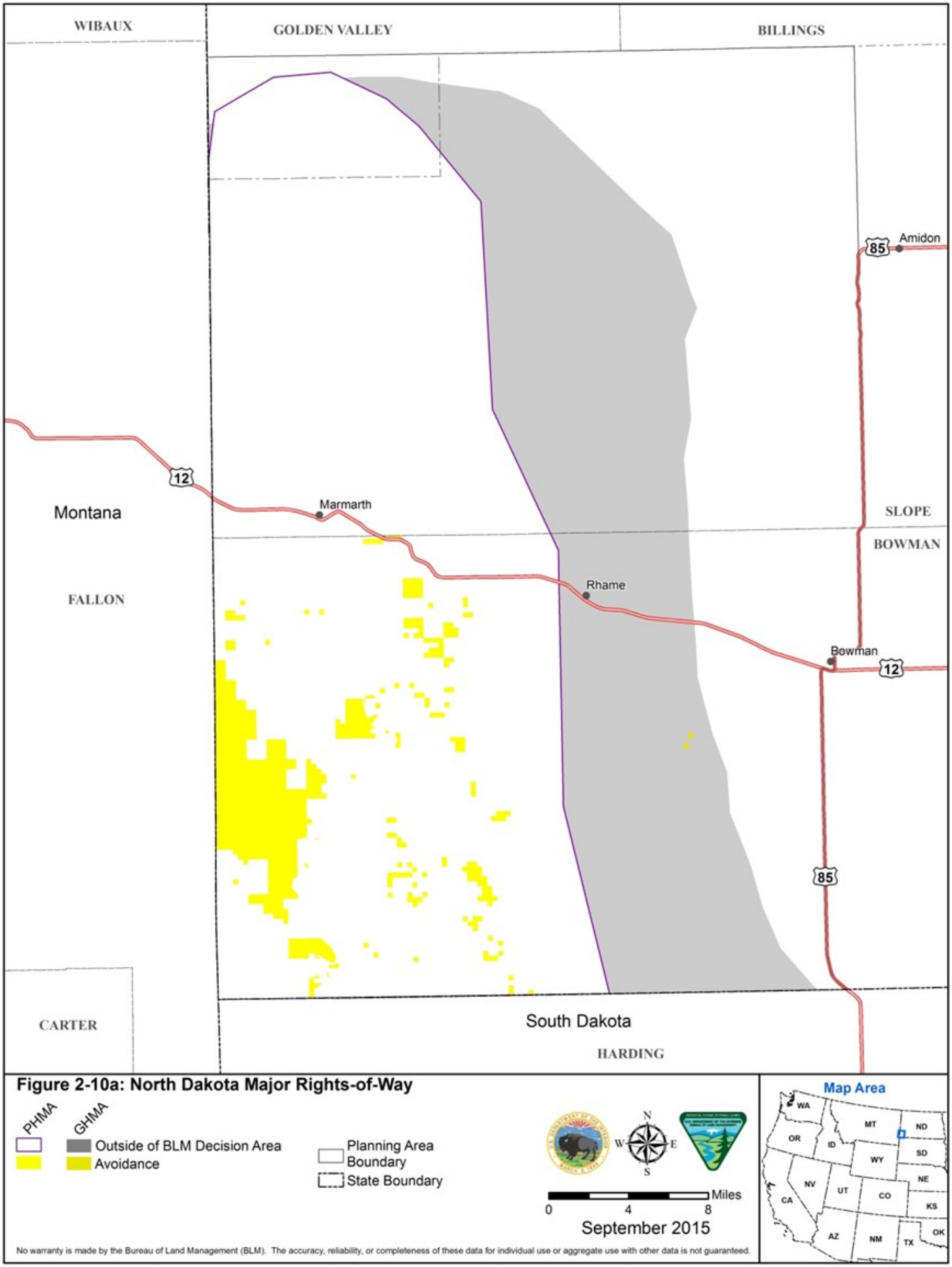
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Figure 2-10a: North Dakota Major Rights-of-Way
PHMA
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Outside of BLM Decision Area
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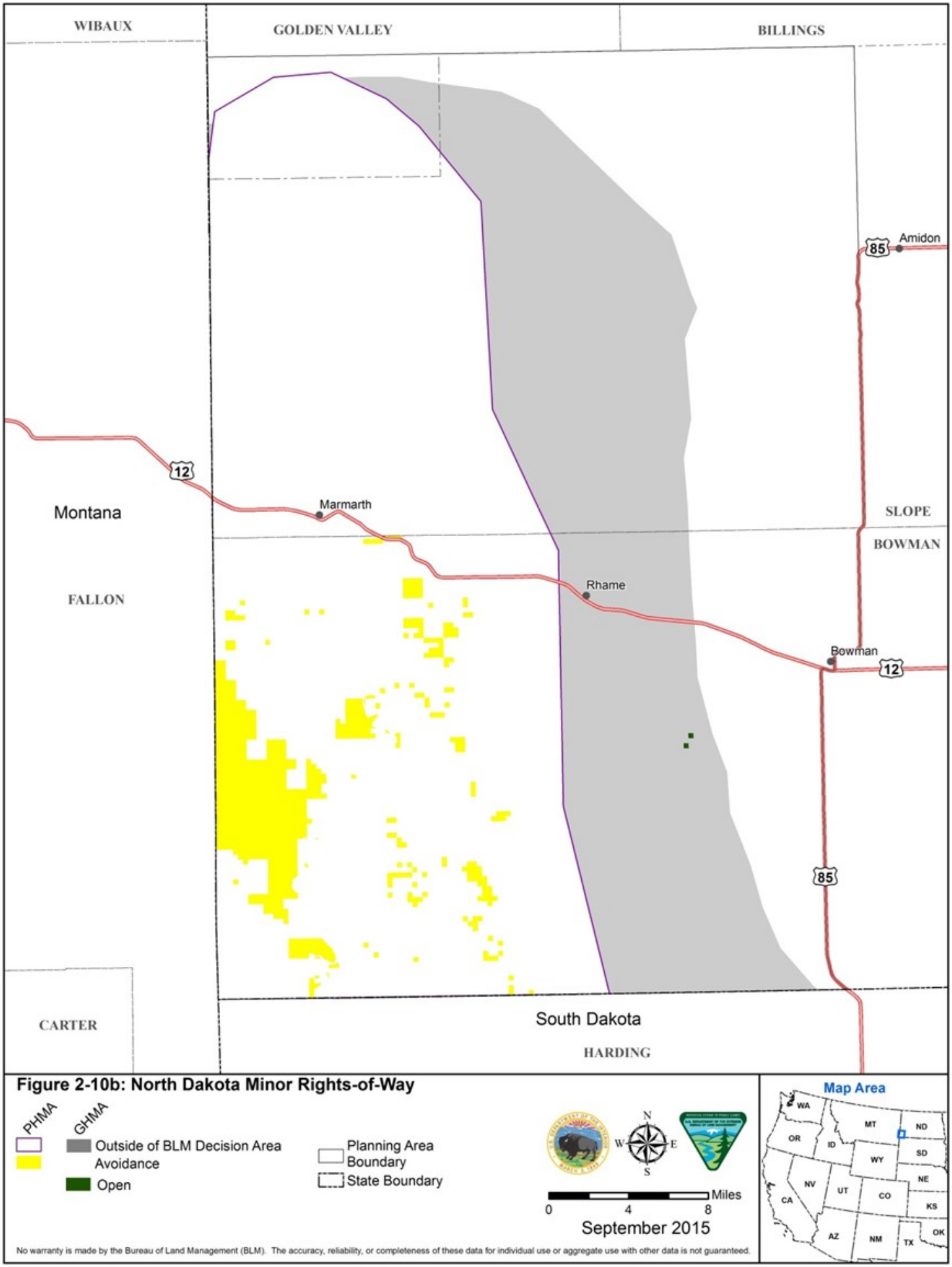
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Figure 2-10b: North Dakota Minor Rights-of-Way
PHMA
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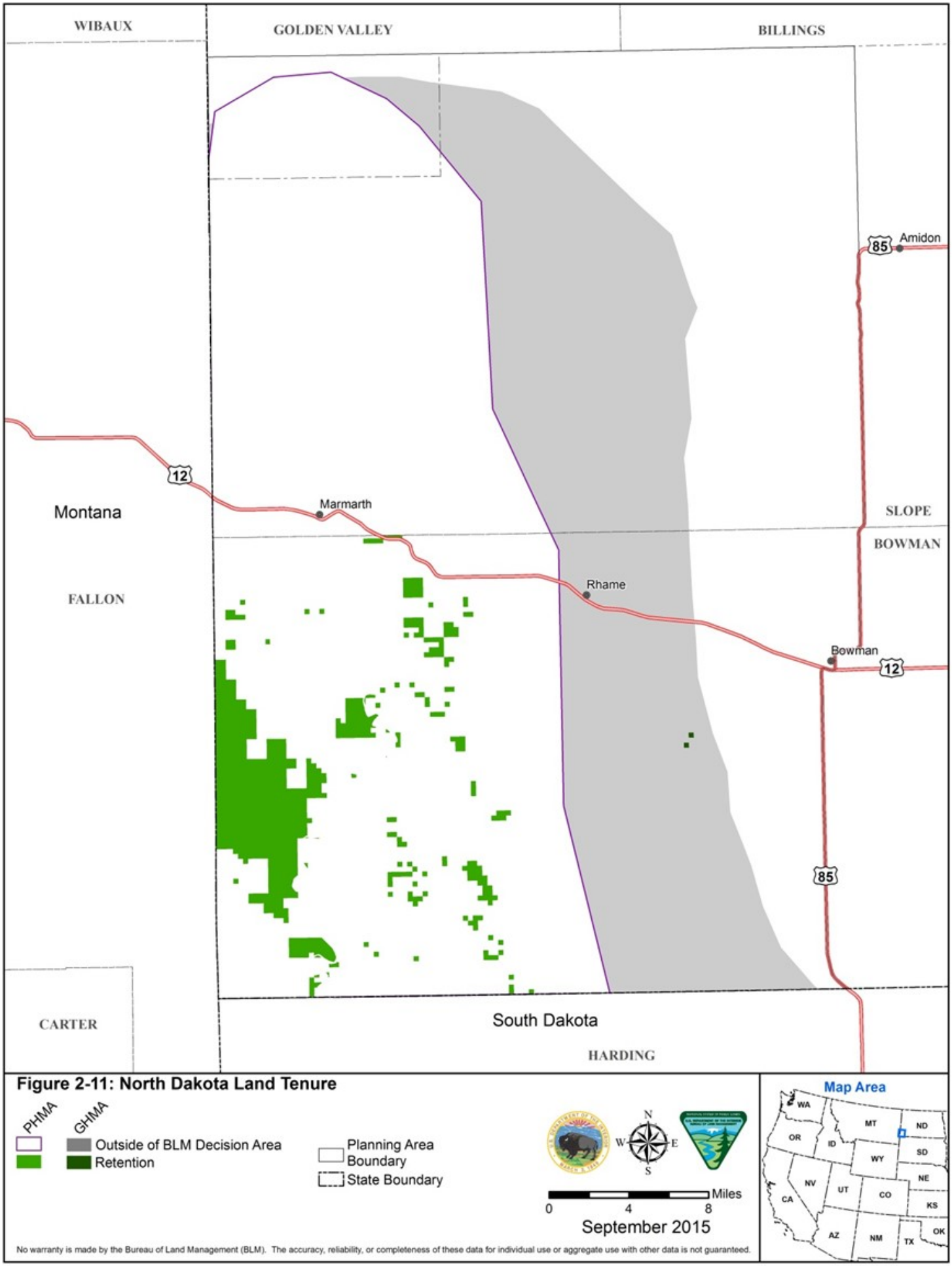
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Figure 2-11: North Dakota Land Tenure
PHMA
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Outside of BLM Decision Area
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Planning Area Boundary
State Boundary
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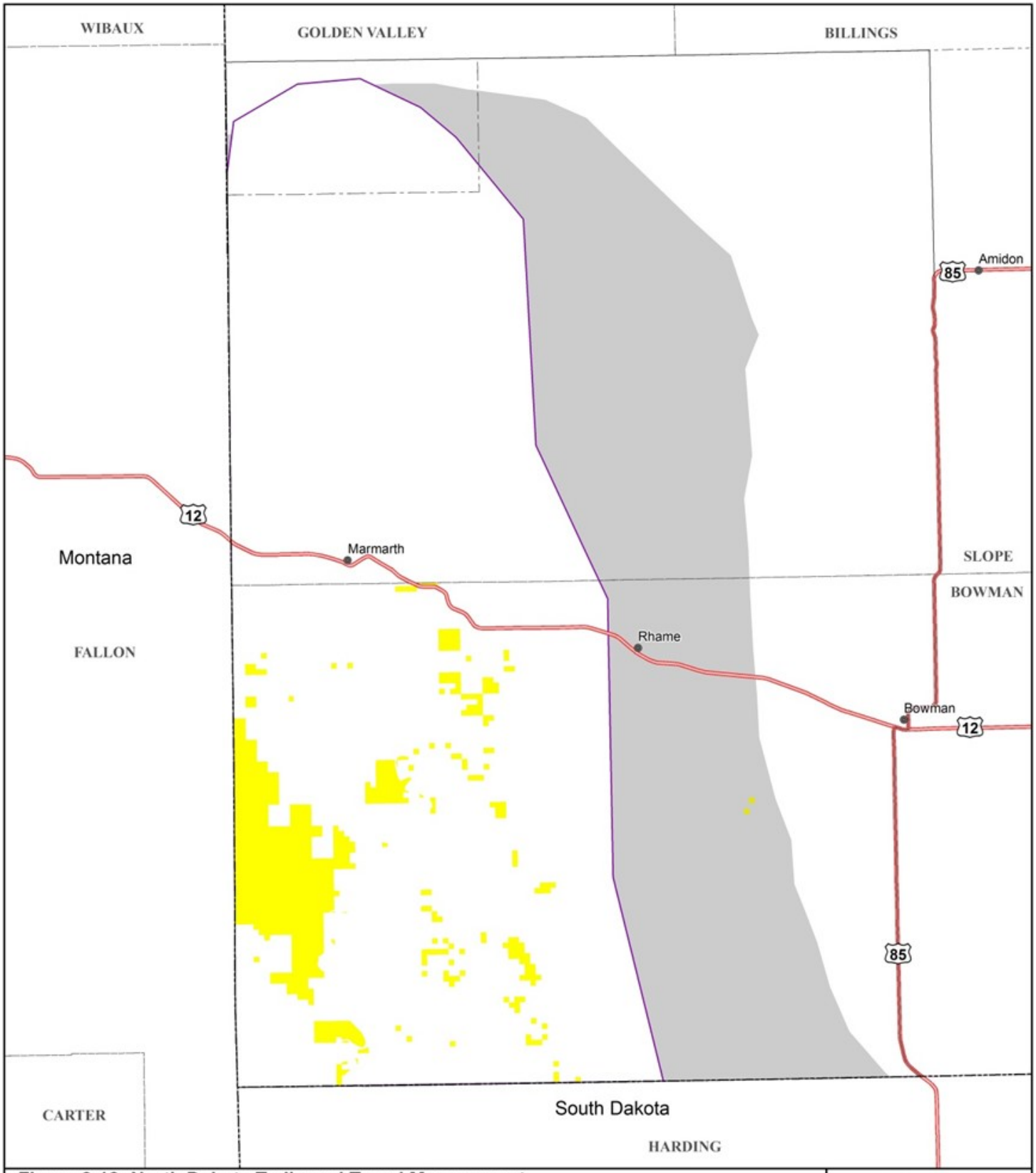
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Figure 2-12: North Dakota Trails and Travel Management
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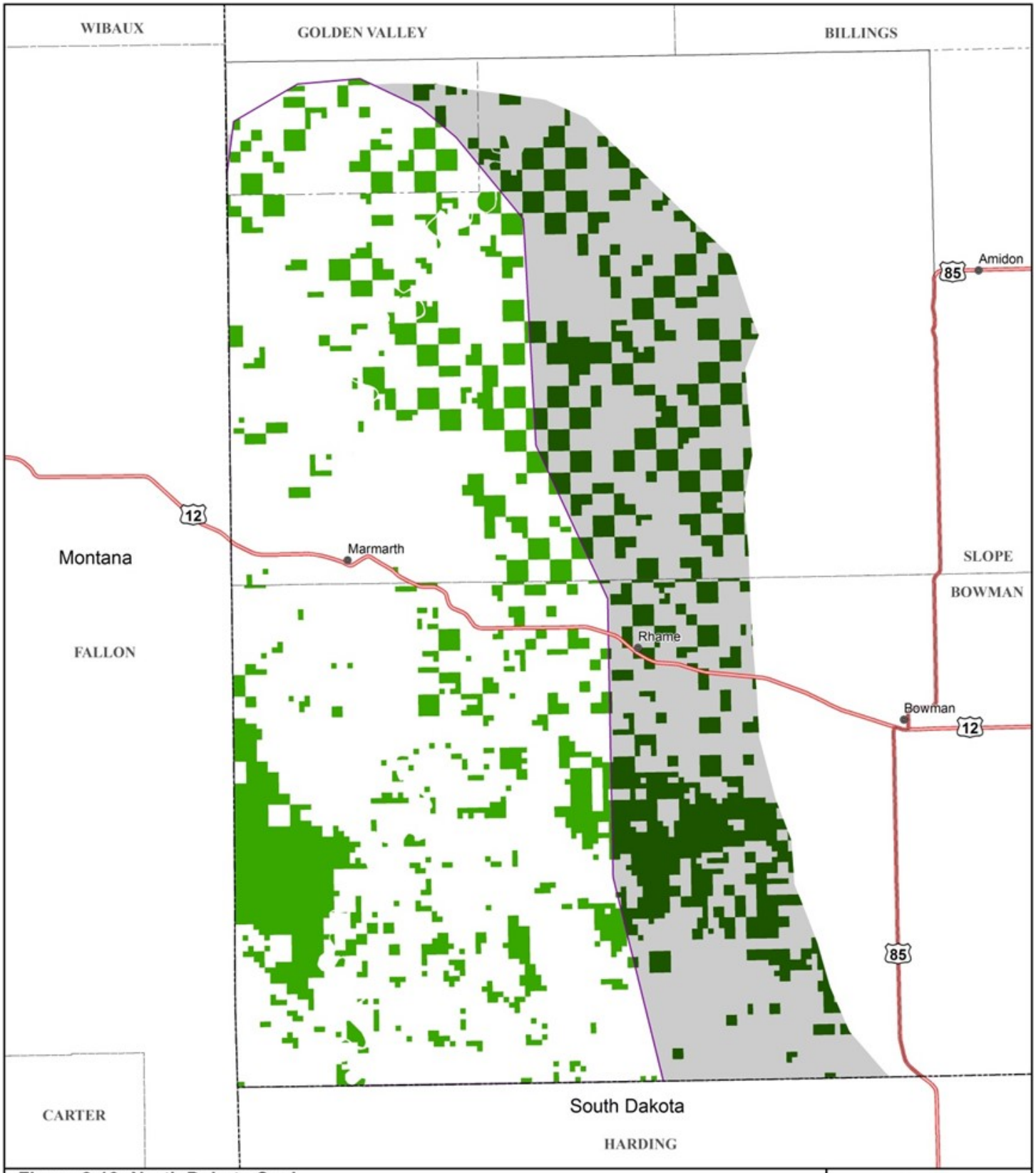
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Figure 2-13: North Dakota Coal
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Appendix B

Applying Lek Buffer-Distances When Approving Actions

APPENDIX B
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 US Department of the Interior, Bureau of Land Management (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, and transmission lines) within 2 miles of leks
- low structures (e.g., fences and rangeland structures) within 1.2 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 and 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 F of the North Dakota Greater Sage-Grouse Approved Resource Management Plan Amendment).

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 C
Required Design Features

APPENDIX C
REQUIRED DESIGN FEATURES

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, a state-implemented conservation measure, or a plan-level protection is determined to provide equal or better protection for GRSG or its habitat; or
- A specific RDF will provide no additional protection to GRSG or its habitat.

Alternatives Summary: There are no RDFs in the current North Dakota Resource Management Plan (RMP). Current management does include the use of BMPs at the project level; however, these are not a land use plan-level decision; for example, the fluid minerals program uses Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book) – these standard and guidelines are updated as needed and not listed in the 1988 North Dakota RMP.

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

PHMA

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 right-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 priority areas. Have no tanks at well locations within priority areas (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.
- The BLM would work with proponents to limit project-related noise where it would be expected to reduce functionality of habitats that support GRSG populations. The BLM would evaluate the potential for limitation of new noise sources on a case-by-case basis as appropriate.

  As additional research and information emerges, specific new limitations appropriate to the type of projects being considered would be evaluated, and appropriate limitations would be implemented where necessary to minimize potential for noise impacts on GRSG population behavioral cycles.

  As new research is completed, new specific limitations would be coordinated with the North Dakota Game and Fish Department (NDGFD) and partners. Limit noise to less than

10 decibels above ambient (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Petricelli 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.

GHMA

Make applicable BMPs mandatory as conditions of approval (COA) within GHMA. BMPs are continuously improving as new science and technology become available and therefore are subject to change. At a minimum include the following BMPs:

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- 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.
- 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.
- 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.
- Use directional and horizontal drilling to reduce surface disturbance.
- Clean up refuse.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Cover (e.g., fine mesh netting or use other effective techniques) all 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 (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Doherty 2007).

Reclamation

- Include restoration objectives to meet GRSG habitat needs in reclamation practices/sites. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve GRSG habitat needs.

Literature Cited

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REQUIRED DESIGN FEATURES FOR FIRE & FUELS

Fuels Management

1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patters 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 fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).
4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist 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 (e.g., strips) that promotes use by GRSG (See Connelly et al. 2000*)
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 treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.
9. Give priority for implementing specific GRSG habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by GRSG key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within two miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond two miles of key habitat. 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.
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 appropriate, and 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, and strictly managed grazed strips) to ail in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Management

1. Develop state-specific GRSG toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.
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 GRSG resource advisor to all extended attack fires in or near key 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. During periods of multiple fires, ensure line officers are involved in setting priorities.
6. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) 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.
7. 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.
8. Minimize unnecessary cross-country vehicle travel during fire operations in GRSG habitat.
9. Minimize burnout operations in key GRSG habitat areas by constructing direct fireline whenever safe and practical to do so.
10. Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
11. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

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SOLID MINERALS 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, and gates)
- 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 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 (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 GRSG-safe fences.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of PHMA.

Reclamation

- Include restoration objectives to meet GRSG habitat needs in reclamation practices/sites.
- 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 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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Appendix D

The Greater Sage-Grouse Monitoring Framework

APPENDIX D
THE GREATER SAGE-GROUSE MONITORING FRAMEWORK

D.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.

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 D-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 management areas (PHMA), general habitat management areas (GHMA); 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".

This monitoring framework is divided into two sections. The broad and mid-scale methods, described in **Section D.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 D-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 D.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**.

D.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.

Figure D-1
Map of greater sage-grouse range, populations, subpopulations and Priority Areas for Conservation (PACs) as of 2013.

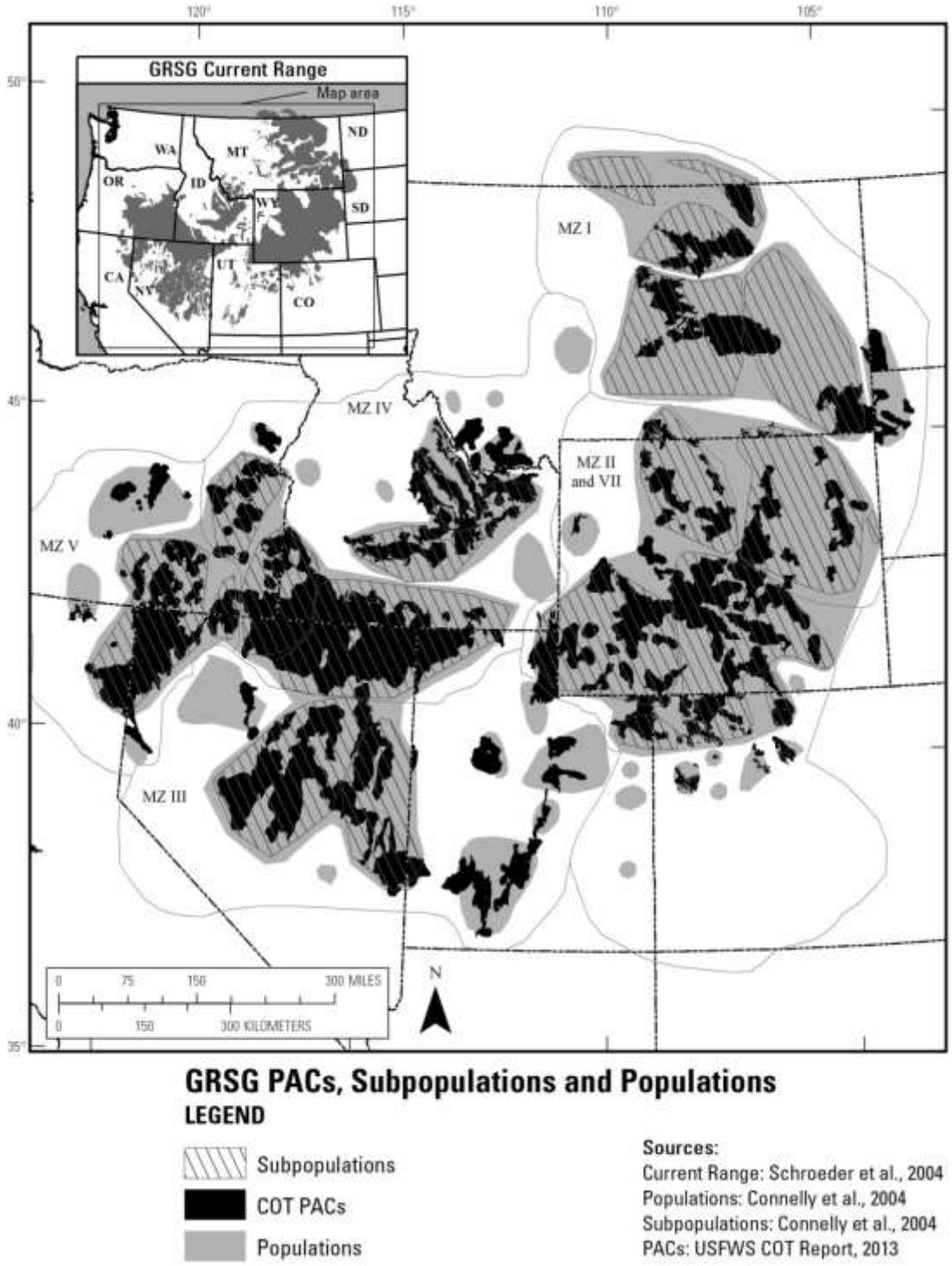

Table D-1
Indicators for monitoring implementation of the strategy, decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid-scales.

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 D.2 e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mining and infrastructure facilities (Table D.2)	Individual population trend

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).

D.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 PHMA, GHMA, at a minimum, for the North Dakota 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 North Dakota 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.

D.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 D-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:

- 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)

Table D-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	

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 D.2.2.1** below). Measures 2 and 3 (see **Section D.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.

D.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 D-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 **SectionD.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 D.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 D-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 D-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 D.2.2.1**)
Existing Vegetation Type (EVT) v1.2	LANDFIRE	Static	2010	Numerator for Sagebrush Availability
Cropland Data Layer (CDL)	National Agricultural Statistics Service (NASS)	Annual	2012	Agricultural Updates; removes existing sagebrush 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 D-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 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.

Table D-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*

Table D-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 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.
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*

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 D-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 D-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 D-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 D-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*
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*

Table D-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
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 D-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. 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.

D.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 D-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 D-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. A 5-year summary report will be available to the USFWS.

Habitat Degradation Datasets and Assumptions:

Energy (oil and gas wells and development facilities)

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 D-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)

D.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 D-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 D-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 D-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
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)

Table D-6
Geospatial Data Sources for Habitat Degradation (Measure 2).

USFWS Listing Decision Threat	Data Source	Direct Area of Influence
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 D.2.2.2**]

Energy (coal mines)
[See **Section D.2.2.2**]

Energy (wind towers)
[See **Section D.2.2.2**]

Energy (solar energy facilities)
[See **Section D.2.2.2**]

Energy (geothermal energy facilities)
[See **Section D.2.2.2**]

Mining (active developments; locatable, leasable, saleable)
[See **Section D.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.

D.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.

D.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 North Dakota 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 D.3**). The information will also include the trend of disturbance within these areas of interest.

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.

To determine the effectiveness of the sage-grouse objectives of this North Dakota 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 to 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 D.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 D.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 D.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 D.2.2.1**, Sagebrush Availability).This measure is derived from the national data sets that remove sagebrush (**Table D-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 D.2.2.2**, Habitat Degradation, Percent) and Measure 3 **Section D.2.2.2**, Habitat Degradation, Intensity). These measures are all derived from the national disturbance data sets that

degrade habitat (**Table D-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.

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.

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 D.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 causation determination, and/ or determine if changes to management decisions are warranted.

D.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 D.2.4**.

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 D.4**), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan of the North Dakota 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 D.2.4**).

D.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 North Dakota Greater Sage-Grouse RMPA/EIS Monitoring Plan using this Greater Sage-grouse Monitoring Framework as a guide.

D.5 THE GREATER SAGE-GROUSE DISTURBANCE AND MONITORING SUB-TEAM MEMBERSHIP

Gordon Toevs (BLM -WO)
Duane Dippon (BLM-WO)
Frank Quamen (BLM-NOC)
David Wood (BLM-NOC)
Vicki Herren (BLM-NOC)
Matt Bobo (BLM-NOC)
Michael "Sherm" Karl (BLM-NOC)
Emily Kachergis (BLM-NOC)
Doug Havlina (BLM-NIFC)
Mike Pellant (BLM-GBRI)
John Carlson (BLM-MT)
Jenny Morton (BLM -WY)
Robin Sell (BLM-CO)
Paul Makela (BLM-ID)
Renee Chi (BLM-UT)
Sandra Brewer (BLM-NV)
Glenn Frederick (BLM-OR)
Robert Skorkowsky (USFS)
Dalinda Damm (USFS)
Rob Mickelsen (USFS)
Tim Love (USFS)
Pam Bode (USFS)
Lief Wiechman (USFWS)
Lara Juliusson (USFWS)

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ATTACHMENT A – AN OVERVIEW OF MONITORING COMMITMENTS

	Broad and Mid-scales					Fine & Site Scales
	Implementation	**Sagebrush Availability**	**Habitat Degradation**	**Population**	**Effectiveness**	
How will the data be used?	Tracking and documenting implementation of RMP decisions	Tracking changes in land cover (sagebrush)	Tracking changes in disturbance (threats) to sage-grouse	Tracking trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies)	Characterizing the relationship among disturbance, implementation actions, and sagebrush metrics	Measuring seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculating disturbance
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
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)
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 implementation 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).

Appendix E

Greater Sage-Grouse Disturbance Caps

APPENDIX E
GREATER SAGE-GROUSE 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 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.) would 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 anthropogenic disturbance cap is exceeded on 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 project analysis area in PHMA, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) would be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the 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 E-1**) 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.

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 E-3**) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)

[1]See **Table E-1**.
[2]See **Table E-2**.

- 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 E-1**, the seven additional features that are considered threats to GRSG (**Table E-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 E-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 E-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 E-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	

Appendix F

Regional Mitigation Strategy

APPENDIX F
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 D-2 in the Monitoring Framework (Appendix D of the North Dakota Greater Sage-Grouse Approved Resource Management Plan Amendment). Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR), Part 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 North Dakota Greater Sage-Grouse 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.

– 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, Part 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, Part 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR, Part 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, Part 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).

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Appendix G
Oil and Gas Stipulations

APPENDIX G
OIL AND GAS STIPULATIONS

GHMA

Stipulation: CSU. All identified GRSG habitat within GHMA is subject to the following operating constraints:

Maintain GRSG habitat to promote movement and genetic diversity of GRSG populations.

To minimize the impacts of surface disturbing/disruptive activities and insure maintenance of habitat for sustainable populations of GRSG within GHMA, surface disturbing and disruptive activities are subject to the following requirements.

a) Surface disturbing/disruptive activities will prevent or minimize disturbance to GRSG or their habitat. Except as identified above or during emergency situations, activities will not compromise the functionality of the habitat.

b) Continuous noise (related to long-term operations and/or activities) would be no greater than 49 decibels at 1/4 mile from the perimeter of the lek.

c) Temporary noise (related to installation, maintenance, one-time use, emergency operations, etc.) exceeding 49 decibels at 1/4 mile from the perimeter of a lek or surface disturbing/disruptive activities may be allowed, but only from 10 a.m. to 4 p.m. between March 15 and May 15.

d) Manage water developments to reduce the spread of West Nile virus within GRSG habitat areas.

e) Site and/or minimize linear ROW to reduce disturbance to sagebrush habitats.

f) Maximize placement of new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.

g) Power lines would be buried, eliminated, designed or sited in a manner which does not impact GRSG.

h) Placement of other high profile structures, exceeding 10 feet in height, would be eliminated, designed or sited in a manner which does not impact GRSG.

i) Remote monitoring of production facilities must be utilized and all permit applications must contain a plan to reduce the frequency of vehicle use.

j) Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.

k) Restore disturbed areas at final reclamation to pre-disturbance conditions or desired plant community.

l) Permanent (longer than two months) structures which create movement must be designed or sited to minimize impacts to GRSG.

m) Consider use of off-site mitigation, (e.g., creation of sagebrush habitat, purchase conservation easements, or buying down grazing) with proponent dollars to offset habitat losses.

n) Consider creation of a "Mitigation Trust Account" when impacts cannot be avoided, minimized, or effectively mitigated through other means. If approved by the BLM, the proponent may contribute funding to maintain habitat function based on the estimated cost of habitat treatments or other mitigation needed to maintain the functions of impacted habitats. Off-site mitigation should only be considered when no feasible options are available to adequately mitigate within and immediately adjacent to the impacted site, or when the off-site location would provide more effective mitigation of the impact than can be achieved on-site.

Objective: Within GHMA, maintain integrity of the habitat, to support sustainable GRSG populations.

Exception: The authorized officer may grant an exception to specific requirements of this stipulation if the action, as proposed or conditioned would not compromise the functionality of the habitat for GRSG and meet the goals for GRSG habitat.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds a portion of GHMA is nonessential or no longer GRSG habitat.

Waiver: The authorized office may waive this stipulation if no protion of the leasehold is within 2 miles of the perimeter of an active lek.

PHMA

Stipulation: Surface occupancy and use is prohibited (NSO) within GRSG PHMA.

Objective: To protect the integrity of the habitat to maintain or improve GRSG populations.

Exception: The BLM Authorized Officer may grant an exception to a fluid mineral lease no-surface-occupancy stipulation only where the proposed action:

i. Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or,

ii. Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG.

Exceptions based on conservation gain (ii) may only be considered in (a) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMPA. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Any exceptions to this lease stipulation may be approved by the BLM Authorized Officer only with the concurrence of the State Director. The BLM Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other GRSG expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publically available at least quarterly.

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Appendix H

GRSG Wildfire and Invasive Species Habitat Assessment

APPENDIX H
GRSG WILDFIRE AND INVASIVE SPECIES HABITAT ASSESSMENT

The following process is a suggestion for a consistent approach in conducting an assessment of the Greater Sage-Grouse (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 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 conserve, enhance, and restore GRSG habitat. The stepdown assessments will serve as a bridge between resource management plans (RMPs) and project level planning, and will position planning efforts to conduct project-scale National Environmental Policy Act (NEPA) following RMP Records of Decision (RODs).

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 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 areas (PHMA), general habitat management areas (GHMA), and/or Priority Areas for Conservation (PACs)).
- 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 conserve, 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 rehabilitation (ESR) 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, 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 lifeforms, 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, and decadent shrub communities)?
- 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, and increasing invasives)?
- 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?

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