

# Lewistown Field Office Greater Sage-Grouse

Draft

Resource Management Plan Amendment  
and Environmental Impact Statement



US Department of the Interior  
Bureau of Land Management  
October 2013



The Bureau of Land Management's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

BLM/MT/PL-14-001

DOI-BLM-MT-L060-2013-0032-EIS

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# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Lewistown Field Office  
920 NE Main  
Lewistown, Montana 59457  
<http://www.blm.gov/mt>



September 18, 2013

Dear Reader:

Enclosed for your review and comment is the Greater Sage-Grouse Proposed Resource Management Plan Amendment (RMPA)/Draft Environmental Impact Statement (DEIS) for the Lewistown Field Office (LFO). This document has been prepared by the Bureau of Land Management (BLM) with assistance from the following cooperating agencies: US Fish and Wildlife Service; Natural Resources Conservation Service; Lewis and Clark National Forest; Montana Department of Fish, Wildlife and Parks; Montana Department of Natural Resources and Conservation; Fergus County; Judith Basin County; Petroleum County; Petroleum County Conservation District; Indian Butte Cooperative State Grazing District (CSGD); Winnett CSGD; and Chain Buttes CSGD.

The DEIS considers and analyzes four alternatives that address future management of approximately 345,560 acres of BLM-administered surface and 639,927 acres of federal mineral estate in central Montana administered by the BLM's LFO. Alternative D is identified as the agency's preferred alternative. Although a preferred alternative has been identified, a final decision has not been made. The final decision, which will be documented in a Record of Decision, will be made after consideration of the comments received on the draft EIS and after a proposed RMPA/final EIS is released.

This DEIS consists of an Executive Summary, Chapters 1 through 6, References, Glossary, Index, and Appendices (including maps). Compact disc copies of the document may be obtained through the LFO, or a copy of the document may be viewed at <http://blm.gov/f9kd> website.

You are invited to review and comment on the DEIS. The public review period for the DEIS is 90 calendar days from the publication date of the Notice of Availability in the *Federal Register* by the US Environmental Protection Agency (EPA). Information regarding public meeting dates, and times to discuss the DEIS and provide comment will be released through the news media and website (identified in letterhead) after the publication of the EPA Notice of Availability.

Written comments can be submitted to: Lewistown Field Office Greater Sage-Grouse EIS, 920 NE Main Street Lewistown, MT 59457. Comments can also be submitted to this email address: [blm\\_mt\\_lfo\\_sage\\_grouse@blm.gov](mailto:blm_mt_lfo_sage_grouse@blm.gov) or through a separate link located at the website shown above. Comments will be fully considered and evaluated in the preparation of the Proposed RMPA and Final EIS, and all substantive comments will be addressed.

Comments will be most useful if they are specific, mention particular pages where appropriate, and address one or more of the following:

- inaccuracies or discrepancies in information
- identification of new information relevant to the analysis
- identification of new impacts, alternatives, or mitigation measures

- specific suggestions for improving management direction

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment -- including your personal identifying information -- may be made publicly available at any time. While you can ask us to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so. We appreciate your help in this planning effort and look forward to your continued interest and participation. For additional information or clarification regarding this document, please contact Jonathan Moor, Public Affairs Specialist, at (406) 538-1943.

Sincerely,

A handwritten signature in black ink that reads "Geoff Beyersdorf". The signature is written in a cursive style with a large, prominent initial "G".

Geoff Beyersdorf  
Field Manager

**Lewistown Field Office Greater Sage-Grouse  
Draft Resource Management Plan Amendment and  
Environmental Impact Statement**

BLM/MT/PL-14-001

DOI-BLM-MT-L060-2013-0032-EIS

1. Responsible Agency: United States Department of the Interior  
Bureau of Land Management
2. Type of Action: Administrative (X) Legislative ( )
3. Document Status: Draft (X) Final ( )
4. Abstract: The draft resource management plan amendment (RMPA)/environmental impact statement (EIS) has been prepared by the Bureau of Land Management (BLM) with assistance from the following cooperating agencies: US Fish and Wildlife Service; Natural Resources Conservation Service; Lewis and Clark National Forest; Montana Department of Fish, Wildlife and Parks; Montana Department of Natural Resources and Conservation; Fergus County; Judith Basin County; Petroleum County; Petroleum County Conservation District; Indian Butte Cooperative State Grazing District (CSGD); Winnett CSGD; and Chain Buttes CSGD.

The draft EIS considers and analyzes four alternatives that address future management of approximately 345,560 acres of BLM-administered surface and 639,927 acres of federal mineral estate in central Montana administered by the BLM's Lewistown Field Office (LFO). Alternative A is a continuation of current management (No Action Alternative). Under this alternative, use of public lands and resources would continue to be managed under the Judith Resource Area and Headwaters RMPs, as amended. Alternative B describes management actions taken directly from the Sage-Grouse National Technical Team (NTT) *A Report on National Greater Sage-Grouse Conservation Measures*. Alternative C describes management actions submitted by various citizen groups. Alternative D describes management actions developed by adapting the NTT measures to the five county (Fergus, Petroleum, Judith Basis, Chouteau and Meagher Counties) planning area containing Greater Sage-Grouse habitat within the LFO. Alternative D is the BLM's current preferred alternative. Alternative D is not a final agency decision but instead an indication of the agency's preliminary preference that reflects the best combination of decisions to achieve BLM goals and policies, meet the purpose and need, address the key planning issues, and consider the recommendations of cooperating agencies and BLM specialists.

Major issues discussed in the draft EIS include: lands and realty actions, minerals, recreation and travel management, livestock grazing, vegetation management, fire and fuels management, social, economic and environmental justice, special management areas, and drought and climate change. The alternatives present a range of management actions to achieve the goal of Greater Sage-Grouse conservation for the LFO. When completed, the Record of Decision for the RMPA/EIS will provide allowable uses and management actions for select resources and resource uses to conserve Greater Sage-Grouse and its habitat.

5. Review Period: Comments on the draft RMPA/EIS will be accepted for 90 days following publication of the Notice of Availability by the US Environmental Protection Agency (EPA) in the *Federal Register*. The comment period will be announced in press releases and the website: <http://blm.gov/f9kd>.

6. For further information contact:

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# TABLE OF CONTENTS

Chapter

Page

---

<b>ES.</b>	<b>EXECUTIVE SUMMARY.....</b>	<b>ES- I</b>
ES.1	Introduction .....	ES-1
ES.2	Purpose and Need.....	ES-5
ES.3	Proposed Action.....	ES-5
ES.4	Scoping .....	ES-6
ES.5	Issues.....	ES-7
	ES.5.1 Issues Specific to Lewistown Field Office .....	ES-8
ES.6	Planning Criteria.....	ES-8
ES.7	Management Alternatives .....	ES-10
	ES.7.1 Alternative A (No Action).....	ES-11
	ES.7.2 Elements Common to Action Alternatives B, C, and D .....	ES-12
	ES.7.3 Alternative B.....	ES-13
	ES.7.4 Alternative C .....	ES-13
	ES.7.5 Alternative D (Agency Preferred) .....	ES-13
ES.8	Environmental Consequences .....	ES-14
<b>I.</b>	<b>INTRODUCTION .....</b>	<b>I- I</b>
I.1	Introduction .....	I-1
I.2	Purpose and Need.....	I-3
I.3	Proposed Action.....	I-3
I.4	Description of the Greater Sage-Grouse Planning Area.....	I-4
	I.4.1 Overview .....	I-4
I.5	BLM Planning Process .....	I-6
	I.5.1 Implementation of Land Use Plans .....	I-7
	I.5.2 Monitoring.....	I-8
I.6	Scoping and Identification of Issues .....	I-8
	I.6.1 The Scoping Process .....	I-8
	I.6.2 Scoping Comments .....	I-9
	I.6.3 Issues Identified .....	I-10
	I.6.4 Issues Considered but Not Further Analyzed.....	I-11
	I.6.5 Issues Beyond the Scope of the Plan.....	I-13
I.7	Development of Planning Criteria .....	I-14
I.8	Relationship to Other Policies, Plans, and Programs .....	I-17
	I.8.1 National Greater Sage-Grouse Planning Strategy.....	I-17
	I.8.2 Instruction Memorandum No. 2012-043, <i>Greater Sage-Grouse Interim Management Policies and Procedures</i> .....	I-18
	I.8.3 Greater Sage-Grouse ( <i>Centrocercus urophasianus</i> ) Conservation Objectives Final Report.....	I-19
	I.8.4 Summary of Science, Activities, Programs and Policies that Influence the Rangewide Conservation of Greater Sage-Grouse ( <i>Centrocercus urophasianus</i> ) .....	I-19
	I.8.5 National Level Programmatic EISs and Agreements .....	I-19
	I.8.6 Relevant Plan Amendments.....	I-20
	I.8.7 Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota....	I-20

---

# TABLE OF CONTENTS *(continued)*

Chapter		Page
<b>2.</b>	<b>PROPOSED ACTION AND ALTERNATIVES.....</b>	<b>2-1</b>
2.1	Introduction .....	2-1
2.2	Introduction to Alternatives .....	2-2
2.3	Alternatives Development Process for the Lewistown Field Office Greater Sage-Grouse Plan Amendment.....	2-3
2.3.1	Developing a Reasonable Range of Alternatives .....	2-3
2.4	Resulting Range of Alternatives.....	2-3
2.4.1	Management Common to All Alternatives.....	2-8
2.4.2	Alternative A (No Action).....	2-8
2.4.3	Elements Common to Alternatives B, C, and D.....	2-9
2.4.4	Alternative B.....	2-10
2.4.5	Alternative C .....	2-11
2.4.6	Alternative D (Agency Preferred) .....	2-13
2.5	Regional Mitigation Strategy.....	2-14
2.6	Monitoring for the Greater Sage-grouse Planning Strategy.....	2-15
2.7	Adaptive Management .....	2-17
2.7.1	Adaptive Management and Monitoring.....	2-17
2.7.2	Adaptive Management Plan.....	2-17
2.8	Alternatives Eliminated from Detailed Analysis .....	2-19
2.8.1	National Technical Team Conservation Measures Not Applicable to Lewistown Field Office.....	2-19
2.8.2	Elimination of Livestock Grazing from BLM Lands.....	2-19
2.9	Considerations for Selecting a Preferred Alternative.....	2-20
2.9.1	Recommendations and Resulting Actions.....	2-21
2.10	Summary Comparison of Alternatives .....	2-21
2.10.1	How to Read Table 2-4.....	2-25
2.11	Comparison of Alleviated Threats to GRSG in Lewistown Field Office by Alternative.....	2-45
2.12	Summary Comparison of Environmental Consequences.....	2-48
<b>3.</b>	<b>AFFECTED ENVIRONMENT .....</b>	<b>3-1</b>
3.1	Introduction .....	3-1
3.2	Organization of Chapter 3 .....	3-1
3.2.1	WAFWA Management Zone Data.....	3-4
3.3	Greater Sage-Grouse.....	3-4
3.3.1	Conditions of the Planning Area.....	3-7
3.3.2	Conditions on BLM-Administered Lands.....	3-15
3.3.3	Trends .....	3-18
3.4	Lands and Realty .....	3-19
3.4.1	Conditions of the Planning Area.....	3-21
3.4.2	Conditions on BLM-Administered Lands.....	3-23
3.4.3	Trends .....	3-27
3.5	Vegetation (Including Noxious Weeds; Riparian and Wetlands).....	3-27
3.5.1	Conditions of the Planning Area.....	3-28
3.5.2	Conditions on BLM-Administered Lands.....	3-33
3.5.3	Trends .....	3-36

---

## TABLE OF CONTENTS *(continued)*

Chapter		Page
3.6	Wildland Fire Management and Ecology .....	3-37
	3.6.1 Conditions of the Planning Area .....	3-38
	3.6.2 Conditions on BLM-Administered Lands.....	3-39
	3.6.3 Trends .....	3-42
3.7	Fluid Minerals.....	3-43
	3.7.1 Conditions of the Planning Area .....	3-43
	3.7.2 Conditions on BLM-Administered Lands.....	3-47
	3.7.3 Trends .....	3-49
3.8	Solid Leasable Minerals.....	3-49
	3.8.1 Conditions of the Planning Area .....	3-49
	3.8.2 Conditions on BLM-Administered Lands.....	3-50
	3.8.3 Trends .....	3-50
3.9	Locatable Minerals.....	3-50
	3.9.1 Conditions of the Planning Area .....	3-50
	3.9.2 Conditions on BLM-Administered Lands.....	3-51
	3.9.3 Trends .....	3-51
3.10	Salable Minerals.....	3-51
	3.10.1 Conditions of the Planning Area .....	3-51
	3.10.2 Conditions on BLM-Administered Lands.....	3-52
	3.10.3 Trends .....	3-53
3.11	Comprehensive Travel and Transportation Management .....	3-53
	3.11.1 Conditions of the Planning Area .....	3-53
	3.11.2 Conditions on BLM-Administered Lands.....	3-55
	3.11.3 Trends .....	3-56
3.12	Recreation .....	3-56
	3.12.1 Conditions of the Planning Area .....	3-56
	3.12.2 Conditions on BLM-Administered Lands.....	3-57
	3.12.3 Trends .....	3-59
3.13	Range Management.....	3-60
	3.13.1 Conditions of the Planning Area .....	3-61
	3.13.2 Conditions on BLM-Administered Lands.....	3-63
	3.13.3 Trends .....	3-67
3.14	Areas of Critical Environmental Concern .....	3-68
	3.14.1 Conditions of the Planning Area .....	3-69
	3.14.2 Conditions on BLM-Administered Lands.....	3-69
	3.14.3 Trends .....	3-70
3.15	Air Resources.....	3-70
	3.15.1 Conditions of the Planning Area .....	3-71
	3.15.2 Conditions on BLM-Administered Lands.....	3-75
	3.15.3 Trends .....	3-75
3.16	Climate.....	3-76
	3.16.1 Conditions of the Planning Area .....	3-77
	3.16.2 Conditions on BLM-Administered Lands.....	3-77
	3.16.3 Trends .....	3-78
3.17	Soil Resources .....	3-78
	3.17.1 Conditions of the Planning Area .....	3-79
	3.17.2 Conditions on BLM-Administered Lands.....	3-80

---

## TABLE OF CONTENTS *(continued)*

Chapter	Page
3.17.3	Trends .....3-83
3.18	Water Resources.....3-83
3.18.1	Conditions of the Planning Area .....3-83
3.18.2	Conditions on BLM-Administered Lands.....3-84
3.18.3	Trends .....3-90
3.19	Special Status Species – Other Species of Issue .....3-90
3.19.1	Conditions of the Planning Area .....3-91
3.19.2	Conditions on BLM-Administered Lands.....3-92
3.19.3	Trends .....3-92
3.20	Fish and Wildlife.....3-93
3.20.1	Conditions of the Planning Area .....3-94
3.20.2	Conditions on BLM-Administered Lands.....3-95
3.20.3	Trends .....3-95
3.21	Renewable Energy .....3-95
3.21.1	Conditions of the Planning Area .....3-97
3.21.2	Conditions on BLM-Administered Lands.....3-98
3.21.3	Trends .....3-98
3.22	Social and Economic Conditions.....3-99
3.22.1	Existing Conditions.....3-99
3.23	Environmental Justice.....3-106
3.23.1	Existing Conditions.....3-106
<b>4.</b>	<b>ENVIRONMENTAL CONSEQUENCES..... 4-1</b>
4.1	Introduction .....4-1
4.1.1	Analytical Assumptions.....4-2
4.1.2	General Methodology for Analyzing Impacts.....4-4
4.1.3	Incomplete or Unavailable Information .....4-5
4.2	Greater Sage-Grouse.....4-5
4.2.1	Methods and Assumptions .....4-5
4.2.2	Nature and Type of Effects .....4-7
4.2.3	Alternative A.....4-15
4.2.4	Alternative B .....4-20
4.2.5	Alternative C .....4-24
4.2.6	Alternative D .....4-28
4.2.7	Impacts Summary.....4-30
4.3	Lands and Realty .....4-44
4.3.1	Methods and Assumptions .....4-44
4.3.2	Nature and Type of Effects .....4-45
4.3.3	Impacts Common to All Alternatives .....4-46
4.3.4	Alternative A.....4-46
4.3.5	Alternative B .....4-47
4.3.6	Alternative C .....4-48
4.3.7	Alternative D .....4-49
4.4	Vegetation (Including Noxious Weeds; Riparian and Wetlands).....4-50
4.4.1	Methods and Assumptions .....4-50
4.4.2	Nature and Type of Effects .....4-51
4.4.3	Impacts Common to All Alternatives .....4-56

---

**TABLE OF CONTENTS** *(continued)*

Chapter		Page
	4.4.4 Alternative A.....	4-56
	4.4.5 Alternative B.....	4-64
	4.4.6 Alternative C.....	4-66
	4.4.7 Alternative D.....	4-68
4.5	Wildland Fire Management and Ecology.....	4-70
	4.5.1 Methods and Assumptions.....	4-70
	4.5.2 Nature and Type of Effects.....	4-70
	4.5.3 Impacts Common to All Alternatives.....	4-73
	4.5.4 Alternative A.....	4-73
	4.5.5 Alternative B.....	4-75
	4.5.6 Alternative C.....	4-77
	4.5.7 Alternative D.....	4-78
4.6	Fluid Minerals.....	4-80
	4.6.1 Methods and Assumptions.....	4-80
	4.6.2 Nature and Type of Effects.....	4-81
	4.6.3 Impacts Common to All Alternatives.....	4-82
	4.6.4 Alternative A.....	4-82
	4.6.5 Alternative B.....	4-83
	4.6.6 Alternative C.....	4-83
	4.6.7 Alternative D.....	4-84
4.7	Solid Leasable Minerals.....	4-84
	4.7.1 Methods and Assumptions.....	4-84
	4.7.2 Nature and Type of Effects.....	4-86
	4.7.3 Alternative A.....	4-86
	4.7.4 Alternative B.....	4-86
	4.7.5 Alternative C.....	4-87
	4.7.6 Alternative D.....	4-87
4.8	Solid Minerals (Locatable Minerals).....	4-87
	4.8.1 Methods and Assumptions.....	4-87
	4.8.2 Nature and Type of Effects.....	4-89
	4.8.3 Alternative A.....	4-89
	4.8.4 Alternative B.....	4-89
	4.8.5 Alternative C.....	4-90
	4.8.6 Alternative D.....	4-90
4.9	Solid Minerals (Salable Minerals).....	4-91
	4.9.1 Methods and Assumptions.....	4-91
	4.9.2 Nature and Type of Effects.....	4-92
	4.9.3 Alternative A.....	4-93
	4.9.4 Alternative B.....	4-93
	4.9.5 Alternative C.....	4-94
	4.9.6 Alternative D.....	4-94
4.10	Comprehensive Travel and Transportation Management.....	4-95
	4.10.1 Methods and Assumptions.....	4-95
	4.10.2 Nature and Type of Effects.....	4-96
	4.10.3 Alternative A.....	4-97
	4.10.4 Alternative B.....	4-97
	4.10.5 Alternative C.....	4-98

---

**TABLE OF CONTENTS** *(continued)*

Chapter		Page
	4.10.6 Alternative D .....	4-98
4.11	Recreation .....	4-99
	4.11.1 Methods and Assumptions .....	4-99
	4.11.2 Nature and Type of Effects .....	4-100
	4.11.3 Impacts Common to All Alternatives .....	4-102
	4.11.4 Alternative A.....	4-102
	4.11.5 Alternative B.....	4-103
	4.11.6 Alternative C .....	4-105
	4.11.7 Alternative D .....	4-106
4.12	Range Management.....	4-107
	4.12.1 Methods and Assumptions .....	4-107
	4.12.2 Nature and Type of Effects .....	4-109
	4.12.3 Impacts Common to All Alternatives .....	4-112
	4.12.4 Alternative A.....	4-113
	4.12.5 Alternative B.....	4-116
	4.12.6 Alternative C .....	4-119
	4.12.7 Alternative D .....	4-121
4.13	Areas of Critical Environmental Concern .....	4-123
	4.13.1 Methods and Assumptions .....	4-123
	4.13.2 Nature and Type of Effects .....	4-124
	4.13.3 Impacts Common to All Alternatives .....	4-125
	4.13.4 Alternative A.....	4-125
	4.13.5 Alternative B.....	4-126
	4.13.6 Alternative C .....	4-126
	4.13.7 Alternative D .....	4-128
4.14	Air Resources .....	4-128
	4.14.1 Methods and Assumptions .....	4-128
	4.14.2 Nature and Type of Effects .....	4-128
	4.14.3 Alternative A.....	4-129
	4.14.4 Alternative B.....	4-129
	4.14.5 Alternative C .....	4-130
	4.14.6 Alternative D .....	4-131
4.15	Climate.....	4-131
	4.15.1 Methods and Assumptions .....	4-131
	4.15.2 Nature and Type of Effects .....	4-132
	4.15.3 Alternative A.....	4-132
	4.15.4 Alternative B.....	4-132
	4.15.5 Alternative C .....	4-133
	4.15.6 Alternative D .....	4-133
4.16	Soil Resources .....	4-134
	4.16.1 Methods and Assumptions .....	4-134
	4.16.2 Nature and Type of Effects .....	4-135
	4.16.3 Impacts Common to All Alternatives .....	4-137
	4.16.4 Alternative A.....	4-137
	4.16.5 Alternative B.....	4-139
	4.16.6 Alternative C .....	4-141
	4.16.7 Alternative D .....	4-142

---

## TABLE OF CONTENTS (continued)

Chapter		Page
4.17	Water Resources.....	4-144
4.17.1	Methods and Assumptions .....	4-144
4.17.2	Nature and Type of Effects .....	4-145
4.17.3	Impacts Common to All Alternatives .....	4-146
4.17.4	Alternative A.....	4-147
4.17.5	Alternative B.....	4-149
4.17.6	Alternative C .....	4-151
4.17.7	Alternative D .....	4-153
4.18	Special Status Species – Other Species of Issue.....	4-154
4.18.1	Methods and Assumptions .....	4-154
4.18.2	Nature and Type of Effects .....	4-156
4.18.3	Impacts Common to All Alternatives .....	4-160
4.18.4	Alternative A.....	4-160
4.18.5	Alternative B.....	4-164
4.18.6	Alternative C .....	4-167
4.18.7	Alternative D .....	4-171
4.19	Fish and Wildlife.....	4-174
4.19.1	Methods and Assumptions .....	4-174
4.19.2	Nature and Type of Effects .....	4-176
4.19.3	Impacts Common to All Alternatives .....	4-177
4.19.4	Alternative A.....	4-177
4.19.5	Alternative B.....	4-178
4.19.6	Alternative C .....	4-180
4.19.7	Alternative D .....	4-182
4.20	Renewable Energy .....	4-184
4.20.1	Methods and Assumptions .....	4-184
4.20.2	Nature and Type of Effects .....	4-185
4.20.3	Impacts Common to All Alternatives .....	4-185
4.20.4	Alternative A.....	4-186
4.20.5	Alternative B.....	4-187
4.20.6	Alternative C .....	4-187
4.20.7	Alternative D .....	4-188
4.21	Social and Economic Conditions.....	4-189
4.21.1	Methods and Assumptions .....	4-189
4.21.2	Alternative A.....	4-190
4.21.3	Alternative B.....	4-191
4.21.4	Alternative C .....	4-192
4.21.5	Alternative D .....	4-193
4.22	Environmental Justice.....	4-195
4.23	Unavoidable Adverse Impacts.....	4-195
4.24	Irreversible and Irrecoverable Commitment of Resources .....	4-196
4.25	Relationship Between Local Short-term Uses and Long-term Productivity.....	4-197
<b>5.</b>	<b>CUMULATIVE IMPACTS .....</b>	<b>5-1</b>
5.1	Introduction .....	5-1
5.1.1	Cumulative Analysis Methodology.....	5-1
5.1.2	Past, Present, and Reasonably Foreseeable Future Actions .....	5-2

---

## TABLE OF CONTENTS *(continued)*

Chapter		Page
5.2	Greater Sage-Grouse.....	5-7
5.2.1	WAFWA Management Zone I Analysis.....	5-7
5.2.2	WAFWA Management Zone IV.....	5-16
5.2.3	Conclusions.....	5-19
5.3	Lands and Realty.....	5-21
5.4	Vegetation (Including Noxious Weeds; Riparian and Wetlands).....	5-23
5.5	Wildland Fire Management and Ecology.....	5-26
5.6	Fluid Minerals.....	5-28
5.7	Solid Minerals (Solid Leasable Minerals).....	5-28
5.8	Solid Minerals (Locatable Minerals).....	5-28
5.9	Solid Minerals (Salable Minerals).....	5-28
5.10	Comprehensive Travel and Transportation Management.....	5-29
5.11	Recreation.....	5-30
5.12	Range Management.....	5-31
5.13	Areas of Critical Environmental Concern.....	5-32
5.14	Air Resources.....	5-33
5.15	Climate.....	5-34
5.16	Soil Resources.....	5-35
5.17	Water Resources.....	5-37
5.18	Special Status Species – Other Species of Issue.....	5-39
5.19	Fish and Wildlife.....	5-41
5.20	Renewable Energy.....	5-43
5.21	Social and Economic Conditions.....	5-44
5.22	Environmental Justice.....	5-45
<b>6.</b>	<b>CONSULTATION AND COORDINATION.....</b>	<b>6-1</b>
6.1	Public Involvement.....	6-1
6.1.1	Scoping Process.....	6-2
6.2	Consultation and Coordination.....	6-3
6.3	Cooperating Agencies.....	6-4
6.4	List of Preparers.....	6-6
	<b>REFERENCES.....</b>	<b>REFERENCES-I</b>
	<b>GLOSSARY.....</b>	<b>GLOSSARY-I</b>
	<b>INDEX.....</b>	<b>INDEX-I</b>

---

**TABLES**

Page

---

ES-1	Land Ownership within the Planning Area.....	ES-4
ES-2	Range-Wide Planning Issues for the Lewistown Field Office.....	ES-7
1-1	Land Ownership within the Planning Area.....	1-5
1-2	Range-Wide Planning Issues for the Lewistown Field Office.....	1-10
2-1	Management Zone I – Yellowstone Watershed.....	2-4
2-2	Management Zone IV – Belt Mountains.....	2-6
2-3	Comparative Summary of Alternatives.....	2-22
2-4	Description of Alternatives A, B, C, and D.....	2-27
2-5	Summary of Impacts on GRSG.....	2-45
2-6	Summary of Environmental Consequences of Alternatives A, B, C, and D.....	2-48
3-1	PPH and PGH Occurring on BLM-Administered Lands and Non-BLM Lands in the Planning Area.....	3-7
3-2	Acres of PPH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-Administered Lands in the Lewistown Field Office.....	3-9
3-3	Acres of PGH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-administered Lands within the Lewistown Field Office.....	3-10
3-4	Surface Ownership in PPH and PGH.....	3-13
3-5	2012/2013 Active Lek Sizes within Planning Area.....	3-17
3-6	Land Ownership by Population Area in PPH.....	3-17
3-7	Surface Ownership within the Planning Area.....	3-21
3-8	GRSG Habitat within City Limits.....	3-22
3-9	Transmission Lines within GRSG Habitat.....	3-22
3-10	Number of Communication Towers within GRSG Habitat.....	3-22
3-11	Vertical Obstructions within GRSG Habitat.....	3-23
3-12	Active ROW Authorizations within GRSG Habitat.....	3-24
3-13	ROW Avoidance Areas within the Planning Area.....	3-25
3-14	Communication Sites within the Planning Area.....	3-26
3-15	Withdrawal Lands within GRSG Habitat.....	3-26
3-16	Montana Noxious Weed List.....	3-31
3-17	Cheatgrass Potential within GRSG Habitat.....	3-33
3-18	Cropland within GRSG Habitat.....	3-33
3-19	Vegetation Communities within GRSG Habitat on BLM-Administered Lands.....	3-34
3-20	Wetland Vegetation and Aquatic Habitat within GRSG Habitat on BLM-Administered Lands.....	3-34
3-21	PFC Assessments within GRSG Habitat on BLM-Administered Lands.....	3-35
3-22	Wildland Fire within GRSG Habitat.....	3-38
3-23	High Probability for Wildland Fire within GRSG Habitat.....	3-39
3-24	National Vegetation Condition Class on BLM-Administered Lands.....	3-40
3-25	Fires on BLM-Administered Lands within the Judith Resource Area RMP Area (1992-2012).....	3-41
3-26	2011 County Drilling and Production Statistics.....	3-44
3-27	Open to Oil and Gas Leasing within GRSG Habitat.....	3-45
3-28	Closed to Oil and Gas Leasing within GRSG Habitat.....	3-45
3-29	Oil and Gas Leases within GRSG Habitat.....	3-46
3-30	Oil and Gas Leases Held by Production within GRSG Habitat.....	3-46
3-31	Oil and Gas Wells within GRSG Habitat.....	3-46
3-32	Federal Mineral Status in the Planning Area.....	3-47
3-33	Existing Oil and Gas Leases.....	3-48

**TABLES** *(continued)*

Page

3-34	Salable Material Disposal Sites within GRSG Habitat .....	3-52
3-35	Miles of Roads within GRSG Habitat.....	3-54
3-36	Acres of Roads within GRSG Habitat.....	3-54
3-37	Miles of Railroads within GRSG Habitat.....	3-54
3-38	Designated SRMAs in the Planning Area.....	3-57
3-39	Designated ERMAs in the Planning Area.....	3-58
3-40	Grazing Allotments within GRSG Habitat.....	3-62
3-41	Allotments Not Meeting Land Health Standards within GRSG Habitat.....	3-63
3-42	Fences within GRSG Habitat .....	3-63
3-43	Lewistown Field Office Planning Area – Grazing Allocation.....	3-64
3-44	Lewistown Field Office Planning Area – Summary of Allotments and AUMs by Habitat Type .....	3-64
3-45	Lewistown Field Office Planning Area – Land Health Assessment.....	3-66
3-46	Air Quality Monitor Values Near the Planning Area (2009-2011)* .....	3-71
3-47	Air Quality Index Report, 2009-2011 .....	3-73
3-48	Annual Average Deposition (2009-2011) .....	3-75
3-49	Dominant Soil Order on BLM-Administered Lands.....	3-80
3-50	NRCS Farmlands on BLM-Administered Lands.....	3-81
3-51	Sensitive Soils in the Planning Area .....	3-82
3-52	Soil Restoration Potential on BLM-Administered Lands.....	3-82
3-53	Developed Water Sources in the Planning Area .....	3-84
3-54	Watershed Acreages in the Planning Area.....	3-85
3-55	Streams on BLM-Administered Lands in the Planning Area.....	3-85
3-56	Acres of Freshwater Pond and Lacustrine in PPH and PGH on BLM-Administered Lands in the Planning Area .....	3-86
3-57	Impaired Streams on BLM-Administered Lands in the Planning Area .....	3-88
3-58	Habitat by Ownership within the Planning Area.....	3-91
3-59	Wildlife Species of the Lewistown Field Office .....	3-94
3-60	Wind Potential on Slopes <15% on BLM-administered Lands.....	3-98
3-61	Population by Race and Ethnicity (2010) .....	3-107
4-1	ROW Exclusion and Avoidance Areas in GRSG Habitat (PH and GH).....	4-17
4-2	Acres and AUMs Available for Grazing in the Planning Area in GRSG Habitat.....	4-18
4-3	Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative .....	4-31
4-4	Comparison of Lands and Realty Indicators by Alternative .....	4-44
4-5	Comparison of Vegetation Indicators by Alternative .....	4-50
4-6	ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres).....	4-58
4-7	AUMs and Acres Available for Grazing in Decision Area .....	4-62
4-8	Withdrawal from Locatable Mineral Entry in Decision Area.....	4-63
4-9	Comparison of Wildland Fire Management and Ecology Indicators by Alternative .....	4-70
4-10	Comparison of Fluid Minerals Indicators by Alternative.....	4-80
4-11	Comparison of Solid Leasable Minerals Indicators by Alternative.....	4-85
4-12	Comparison of Solid Minerals (Locatables) Indicators by Alternative.....	4-88
4-13	Comparison of Solid Minerals (Salable Minerals) Indicators by Alternative.....	4-91
4-14	Comparison of Comprehensive Travel and Transportation Management Indicators by Alternative .....	4-95
4-15	Areas Open/Closed to New Road Construction by Alternative .....	4-97

<b>TABLES</b> <i>(continued)</i>		Page
4-16	Comparison of Recreation Indicators by Alternative .....	4-99
4-17	Comparison of Range Management Indicators by Alternative .....	4-107
4-18	Impacts on Livestock Grazing from Lands and Realty Actions.....	4-114
4-19	Fluid Mineral Impacts on Range Management by Alternative .....	4-115
4-20	Comparison of ACEC Indicators by Alternative .....	4-123
4-21	ACECs by Alternative .....	4-126
4-22	Comparison of Air Resource Indicators by Alternative.....	4-128
4-23	Comparison of Climate Change Indicators by Alternative.....	4-131
4-24	Comparison of Soil Resources Indicators by Alternative.....	4-134
4-25	Quantitative Impact Summary by Alternative for Soils .....	4-137
4-26	Comparison of Water Resources Indicators by Alternative .....	4-144
4-27	Quantitative Impact Summary by Alternative for Water Resources.....	4-147
4-28	Comparison of Special Status Species-Other Species of Issue Indicators by Alternative .....	4-155
4-29	Non-BLM Acreage, GH, and PH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres) .....	4-162
4-30	Comparison of Wildlife Species Indicators by Alternative .....	4-175
4-31	Comparison of Renewable Energy Resource Indicators by Alternative .....	4-184
4-32	BLM-Administered Lands Managed as ROW Exclusion and Avoidance Areas .....	4-186
4-33	“Good” or Better Wind Potential That Would Be Managed as ROW Exclusion and Avoidance Areas .....	4-186
4-34	Wind Potential Affected by Alternative B .....	4-187
4-35	Wind Potential Affected by Alternative C.....	4-188
4-36	Wind Potential Affected by Alternative D .....	4-189
4-37	Employment and Labor Income Generated from Recreation and Grazing under the RMPA.....	4-190
5-1	Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Comprise the Cumulative Impact Scenario .....	5-4
6-1	Cooperating Agencies .....	6-5

<b>DIAGRAMS</b>		Page
1-1	Nine-Step Planning Process.....	1-7
1-2	BLM and Forest Service GRSG Planning Strategy Sub-region/EIS Boundaries.....	1-18
3-1	GRSG Survey Effort, Active Leks and Average Male Counts per Active Lek Surveyed in PPH 1952 – 2013 .....	3-16
3-2	Percentage of PPH Leks in each Size Class 1952 – 2013.....	3-16
3-3	Land Use Authorizations .....	3-24
3-4	Population Change for the Five-County Impact Area .....	3-100
3-5	Employment Distribution in the Five-County Impact Area and Montana .....	3-101

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## APPENDICES

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- A Figures
- B Greater Sage-Grouse Draft Monitoring Framework
- C Required Design Features and Best Management Practices for Greater Sage-Grouse Habitat for Alternatives B and C
- D Required Design Features and Best Management Practices for Greater Sage-Grouse Habitat for Alternative D
- E Area of Critical Environmental Concern Evaluation of Relevance and Importance Criteria
- F Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management for Montana and the Dakotas
- G Regional Mitigation Strategy
- H Land Pattern Review and Land Adjustment
- I Drought Policy
- J Oil and Gas Lease Stipulations
- K GRSG Wildland Fire and Invasive Species Assessment
- L Special Status Species Confirmed or Likely to Inhabit the Planning Area

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## ACRONYMS AND ABBREVIATIONS

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Full Phrase

ACEC	Area of Critical Environmental Concern
AMP	allotment management plan
APD	application for permit to drill
AQI	air quality index
AUM	animal unit month
BER	Baseline Environmental Report
BLM	Bureau of Land Management
BMP	best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
COA	condition of approval
COT	Conservation Objectives Team
CSGD	Cooperative State Grazing District
CTTM	comprehensive travel and transportation management
DOI	Department of the Interior
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act of 1973
ES&R	emergency stabilization and rehabilitation
FLPMA	Federal Land Policy and Management Act of 1976
FMU	Fire Management Unit
Forest Service	United States Department of Agriculture, Forest Service
FRCC	fire regime condition class
GH	general habitat
GHG	greenhouse gas
GIS	geographic information system
GRSG	Greater Sage-Grouse
IM	Instruction Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
LFO	Lewistown Field Office
MCF	thousand cubic feet
MFWP	Montana Fish, Wildlife, and Parks
MOU	memorandum of understanding
MTDEQ	Montana Department of Environmental Quality
MTNHP	Montana Natural Heritage Program

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**ACRONYMS AND ABBREVIATIONS** *(continued)*

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Full Phrase

mw	megawatt
MZ	Management Zone
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969, as amended
NO <sub>2</sub>	nitrogen dioxide
NRCS	National Resource Conservation Service
NSHT	National Scenic/Historic Trails
NSO	no surface occupancy
NTT	National Technical Team
OHV	off-highway vehicle
PAC	Priority Area for Conservation
PCPI	per capita personal income
PFC	proper functioning condition
PGH	preliminary general habitat
PH	priority habitat
PM <sub>2.5</sub>	particulate matter with a diameter less than or equal to 2.5 microns
PM <sub>10</sub>	particulate matter with a diameter less than or equal to 10 microns
PPH	preliminary priority habitat
RDF	required design feature
ReGAP	Regional Gap Analysis Program
RMP	resource management plan
RMPA	resource plan amendment
ROD	record of decision
ROW	right-of-way
SGI	NRCS Sage-Grouse Initiative
SO <sub>2</sub>	sulfur dioxide
SRMA	Special Recreation Management Area
SRP	special recreation permit
TL	timing limitation
TPI	total personal income
US	United States
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAFWA	Western Association of Fish and Wildlife Agencies
WSA	Wilderness Study Area

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## EXECUTIVE SUMMARY



# EXECUTIVE SUMMARY

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## ES.I INTRODUCTION

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

In March 2010, the US Fish and Wildlife Service (USFWS) published its listing decision for the Greater Sage-Grouse (GRSG) as “Warranted but Precluded” (75 *Federal Register* 13910, March 23, 2010). Inadequacy of regulatory mechanisms was identified as a major threat in the USFWS finding on the petition to list the GRSG under the Endangered Species Act (ESA). The USFWS has identified conservation measures in RMPs as the principal regulatory mechanism for protecting GRSG on BLM-administered lands. Based on the identified threats to the GRSG and the USFWS timeline for making a listing decision on this species, the BLM needs to incorporate objectives and adequate conservation measures into RMPs to conserve GRSG and to avoid the potential for its being listed as a threatened or endangered species under the ESA. In response to the USFWS findings, the BLM will evaluate the adequacy of its RMPs and will address, as necessary, amendments and revisions to RMPs throughout the range of the GRSG.

Consistent with the National Greater Sage-Grouse Planning Strategy, the BLM is preparing several environmental impact statements (EISs), with associated plan amendments. These documents will address a range of alternatives focused on specific conservation measures across the range of the GRSG. Several on-going RMP revisions will also be addressing specific conservation measures. The amendments will be coordinated under two administrative planning regions across the entire range of the GRSG. The Rocky Mountain Region and the Great Basin Region boundaries are drawn roughly to correspond with the threats identified by the USFWS in the 2010 listing decision, along with the

Western Association of Fish and Wildlife Agencies (WAFWA) management zones framework (Stiver et al. 2006). The management zones reflect ecological and biological issues and similarities. In addition, management challenges within management zones are similar and GRSG and their habitats are likely responding similarly to environmental factors and management actions. The Rocky Mountain Region consists of land use plans in North Dakota, South Dakota, Wyoming, and Colorado and in portions of Montana and Utah. The Great Basin Region consists of land use plans in California, Nevada, Oregon, and Idaho and in portions of Utah and Montana.

As identified above, this change in direction is the result of the March 2010 publication of the USFWS *12-Month Findings for Petitions to List the Greater-Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered*. In this document, the agency concluded that the GRSG is warranted for listing as a threatened or endangered species. The USFWS reviewed the status and threats to the GRSG in relation to the five listing factors provided in Section 4(a)(1) of the ESA. The USFWS determined that Factor A, “the present or threatened destruction, modification, or curtailment of the habitat or range of the Greater Sage-Grouse,” and Factor D, “the inadequacy of existing regulatory mechanisms,” both posed “a significant threat to the Greater Sage-Grouse now and in the foreseeable future” (75 *Federal Register* 13910, March 23, 2010). This plan amendment, along with the other plans cited above, proposes to address both Listing Factors A and D (above) and proposes to provide consistency in the management of GRSG habitat.

This plan amendment addresses GRSG habitat within the Lewistown Field Office (LFO). The BLM Montana State Office, in coordination with Montana Fish, Wildlife, and Parks (MFWP), has preliminarily mapped this habitat. GRSG habitat falls into one of the two following categories:

- **Preliminary Priority Habitat (PPH)**—Areas that have been identified as having the highest conservation value to maintaining sustainable GRSG populations. These areas include breeding, late brood-rearing and winter concentration areas.
- **Preliminary General Habitat (PGH)**—Areas of seasonal or year-round habitat outside of priority habitat.

Through the land use planning process and plan amendment, the BLM will refine PPH and PGH data to (1) delineate priority habitat (PH) and to analyze actions within PH areas to conserve GRSG habitat functionality, or where possible, improve habitat functionality; and (2) to identify general habitat (GH) areas and analyze actions within GH areas that provide for major life history function (e.g., breeding, migration, or winter survival). This is to maintain genetic diversity needed for sustainable GRSG populations.

Range-wide, approximately 51 percent of sagebrush habitat within GRSG management zones is BLM-administered land; within the LFO, approximately 16 percent of GRSG habitat is on BLM-administered lands. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations that are anticipated across the species' range. Range-wide, conservation measures, in the form of land use decisions will focus on areas affected by threats. Examples of these threats are wildfire, energy development, disease, and infrastructure development, depending on the threats identified for each subregion within the Rocky Mountain and Great Basin regions. The BLM administers a large portion of GRSG habitat within the affected states; because of this, changes in its management of GRSG habitats is anticipated to have a considerable impact on existing GRSG populations across the range of GRSG.

The planning area for the Lewistown Field Office Greater Sage-Grouse Resource Management Plan Amendment (RMPA)/EIS is composed of lands administered by the BLM, the US Department of Agriculture, Forest Service (Forest Service), the USFWS, the US Department of Defense, and the State of Montana. It also includes private lands (**Table ES-I**, Land Ownership within the Planning Area). The planning area is in Chouteau, Fergus, Judith Basin, Meagher, and Petroleum Counties in central Montana. Unlike other RMPAs that are part of the National Greater Sage-Grouse Planning Strategy, the Lewistown Field Office Greater Sage- Grouse RMPA/EIS does not address a range of alternatives for Forest Service surface/federal minerals. The Lewis & Clark National Forest is a cooperating agency; however, they have had minimal involvement in the planning process as the planning area does not include any Forest Service land that is considered GRSG habitat. A map of the planning area is provided as **Figure I-1**, Project Planning Area, in **Appendix A**, Figures.

The planning area incorporates the PPH, PGH and additional lands not considered GRSG habitat. Though the planning area includes private lands, decisions in this amendment are made only for BLM federal surface and federal minerals. Management direction and actions apply only to these BLM-administered lands and to federal mineral estate under BLM jurisdiction that may lie beneath other surface ownership.

The planning area is currently managed under the *Judith Resource Area Resource Management Plan* (BLM 1994) and the *Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision* (BLM 1984). There is an existing protest resolution decision affecting lands managed within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PPH and PGH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a Record of Decision. Because this RMPA only considers management actions for GRSG and does not address oil and gas

**Table ES-1  
Land Ownership within the Planning Area**

	Chouteau County		Fergus County		Judith Basin County		Meagher County		Petroleum County		Planning Area Acres <sup>1</sup>	Planning Area		
	PPH Acres	PGH Acres	PPH Acres	PGH Acres	PPH Acres	PGH Acres	PPH Acres	PGH Acres	PPH Acres	PGH Acres		Non-Habitat Acres		
<b>Surface Ownership</b>														
BLM <sup>2</sup>	0	18,696	83,148	55,855	0	3,692	0	439	150,071	33,659	593,995	233,219	112,341	248,435
Other Federal	0	0	113	2	0	0	0	1,626	3,575	89	1,010,816	3,688	1,717	1,005,411
State Lands	0	11,787	54,903	21,234	0	2,129	0	36,031	35,684	12,257	526,504	90,587	83,438	352,479
Private	0	107,728	506,694	275,159	0	25,627	0	265,747	371,477	142,608	5,168,165	878,171	816,869	3,473,125
Water	0	573	0	0	0	0	0	0	2,329	97	12,039	2,329	670	9,040
<b>Total</b>	<b>0</b>	<b>138,784</b>	<b>644,858</b>	<b>352,250</b>	<b>0</b>	<b>31,448</b>	<b>0</b>	<b>303,843</b>	<b>563,136</b>	<b>188,710</b>	<b>7,311,519</b>	<b>1,207,994</b>	<b>1,015,035</b>	<b>5,088,490</b>
<b>Federal Mineral Estate<sup>3</sup></b>														
All Minerals	0	30,202	102,760	80,304	0	6,679	0	11,910	166,428	43,932	820,108	269,189	173,027	367,480
Other	0	4,231	100,074	65,417	0	260	0	4,417	16,430	6,882	293,733	124,635	82,293	99,239
<b>Total</b>	<b>0</b>	<b>34,433</b>	<b>202,834</b>	<b>145,721</b>	<b>0</b>	<b>6,939</b>	<b>0</b>	<b>16,327</b>	<b>182,858</b>	<b>50,814</b>	<b>1,509,263</b>	<b>393,824</b>	<b>255,320</b>	<b>466,719</b>

Source: BLM 2012a

<sup>1</sup>Planning area acres include PPH, PGH, and non-habitat.<sup>2</sup>For the purpose of this planning process, all BLM-administered lands have subsurface minerals.<sup>3</sup>These terms are derived primarily from master title plats and indicate what minerals are reserved by the federal government.

leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS. *(The LFO RMP revision process will begin in 2013, which will address oil and gas leasing for the entire LFO planning area boundary.)*

The current GRSG habitat on BLM-administered lands in the LFO consists of 233,219 acres of PPH (20 percent of all PPH in the planning area) and 112,341 acres of PGH (11 percent of all PGH in the planning area). PPH and PGH were mapped in cooperation with the MFWP. **Table ES-1** provides acres of PPH and PGH by landowner, and **Figure I-1 (Appendix A)** includes areas mapped as PPH and PGH.

## ES.2 PURPOSE AND NEED

The BLM is preparing RMP amendments and revisions with associated EISs for RMPs containing GRSG habitat. This effort responds to the USFWS's March 2010 "warranted, but precluded" ESA listing petition decision. Inadequacy of regulatory mechanisms was identified as a significant threat in the USFWS finding on the petition to list the GRSG. The USFWS identified the principal regulatory mechanism for the BLM as conservation measures embedded in RMPs. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations that are anticipated across the species' range. These plan amendments and revisions (BLM plans being amended or revised across the entire GRSG range) would focus on areas affected by threats to GRSG habitat identified by the USFWS in the March 2010 listing decision. A threats cross-walk table is included in **Chapter 2, Proposed Action and Alternatives**, to show what threats are being addressed in the range of alternatives for this RMPA/EIS.

The purpose for the RMP amendments and revisions is to identify and incorporate appropriate conservation measures to conserve, enhance and/or restore GRSG habitat by reducing, eliminating, or minimizing threats to that habitat.

Because BLM administers a large portion of GRSG habitat within the affected states, changes in BLM management of GRSG habitats are anticipated to have a considerable beneficial impact on present and future GRSG populations and could reduce the need to list the species as threatened or endangered under the ESA.

## ES.3 PROPOSED ACTION

This proposed Lewistown Field Office Greater Sage-Grouse RMPA/EIS provides future management direction to maintain or increase GRSG abundance and distribution by conserving, enhancing, or restoring the sagebrush ecosystem on which populations depend throughout the LFO portion of WAFWA Management Zones (MZ) 1 and 4 (Stiver et al. 2006). MZ 1 includes all of Montana (except the Dillon Field Office), North Dakota, South Dakota, and northeastern Wyoming. Additionally, a small portion of MZ 4 is within the LFO

in Meagher County. The portions of MZs 1 and 4 within the LFO are analyzed as part of this RMPA/EIS.

Proposed amendments to the Judith Resource Area Resource Management Plan (BLM 1994) and the Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision (BLM 1984) would include allowable uses and management actions for select resources and resource uses. Allowable uses are those that are allowed, restricted, or prohibited and may include stipulations. The decisions to be made are (1) to delineate PH and GH and (2) to identify the management actions, restrictions, and constraints that would be placed on allowable uses on BLM-administered lands to conserve, restore, and enhance GRSG habitat.

#### **ES.4 SCOPING**

Scoping is an early and open process for determining the scope, or range, of issues to be addressed and for identifying the significant issues to consider in the planning process. It is designed to meet the public involvement requirements of FLPMA and National Environmental Policy Act (NEPA). Scoping identifies the affected public and agency concerns and defines the relevant issues and alternatives that will be examined in detail in the plan amendment. A planning issue is defined as a major controversy or dispute regarding management or uses on BLM-administered lands that can be addressed through a range of alternatives.

A 60-day public scoping period began on December 9, 2011, with the publication in the *Federal Register* of a notice of intent to begin a planning effort. The scoping period was extended through a notice of extension published February 10, 2012, and ended on March 23, 2012. This cooperative process included soliciting input from interested state and local governments, tribal governments, other federal agencies and organizations, and individuals to identify the scope of issues to be addressed in the plan amendment and to assist in the formulation of reasonable alternatives. The scoping process is an excellent method for opening dialogue between the BLM and the public about managing GRSG and their habitats on BLM-administered lands. This process also identifies the concerns of those who have an interest in this subject and in the GRSG habitats. As part of the scoping process, the BLM also requested that the public submit nominations for potential Areas of Critical Environmental Concern for GRSG and their habitat.

Scoping included an open-house meeting in Lewistown, Montana, on January 10, 2012. In addition, the BLM issued news releases to notify the public about the scoping period and to invite them to provide written comments. Comments obtained during the scoping period were used to define the relevant issues that would be addressed by a reasonable range of alternatives in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

The National Greater Sage-Grouse Planning Strategy Scoping Summary Report (BLM 2012b) is available at the project website for the national conservation effort: <http://www.blm.gov/wo/st/en/prog/more/sagegrouse.html>. The discussion below provides an overview of the scoping results, both range-wide and specific to eastern Montana.

## ES.5 ISSUES

During the scoping process for the range-wide planning effort, the public and agencies identified the issues to be addressed in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. The issues identified in the Scoping Summary Report, and other resource and use issues identified in the BLM Planning Handbook and Manual (H-1610-1), were considered in developing the alternatives. Range-wide issues identified in the Scoping Summary Report that are applicable for the LFO are in **Table ES-2**, Range-Wide Planning Issues for the Lewistown Field Office.

**Table ES-2**  
**Range-Wide Planning Issues for the Lewistown Field Office**

<b>Issue</b>	<b>Planning Issue Category</b>	<b>Planning Issue</b>
1.	Greater Sage-Grouse and habitat	How would the BLM use the best available science to delineate PPH, PGH, and no-habitat categories and accurately monitor the impact of land uses on GRSG?
2.	Energy and mineral development	How would energy and mineral development, including renewable energy, be managed within GRSG habitat, while recognizing valid existing rights?
3.	Livestock grazing	What measures would the BLM put into place to protect and improve GRSG habitat, while maintaining permitted grazing use?
4.	Vegetation management	How would the BLM conserve, enhance, or restore GRSG habitat, such as sagebrush communities and minimize or prevent the introduction or spread of noxious weeds and invasive species?
5.	Lands and realty	What opportunities exist to adjust public land ownership that would increase management efficiency for GRSG and habitat?
6.	Social, economic, and environmental justice	How could the BLM promote or maintain activities that provide social and economic benefit to local communities, while providing protection for GRSG habitat?
7.	Recreation and travel management	How would motorized, nonmotorized, and mechanized travel be managed to provide access to federal lands and a variety of recreation opportunities, while protecting GRSG habitat?
8.	Fire management	What measure should be undertaken to manage fuels and wildland fires, while protecting GRSG habitat?
9.	Special management areas	What special management areas would the BLM designate to benefit the conservation, enhancement, and restoration of GRSG and habitat?

**Table ES-2**  
**Range-Wide Planning Issues for the Lewistown Field Office**

Issue	Planning Issue Category	Planning Issue
10.	Drought and climate change	How would the BLM incorporate the impacts of a changing climate on GRSG habitat?

### ES.5.1 Issues Specific to Lewistown Field Office

Issues discussed in the comments for the LFO included GRSG habitat, energy and mineral development, livestock grazing, fish and wildlife, social and economic concerns, vegetation management, recreation and travel management, and special management areas. No additional unique comment themes were identified outside of the issues identified in the range-wide analysis (**Table ES-2**).

### ES.6 PLANNING CRITERIA

Planning criteria are the standards, rules, and factors used as the sideboards to resolve issues and develop alternatives. Planning criteria are based on appropriate laws, regulations, BLM Manual sections, and policy directives. Criteria also were based on public participation and coordination with cooperating agencies, other federal agencies, state and local governments, and Indian tribes. Planning criteria are prepared to ensure decision making is tailored to the issues and to ensure that the BLM avoids unnecessary data collection and analysis.

- The BLM will use the USFWS's Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report (USFWS 2013), WAFWA's Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (Connelly et al. 2004), US Geological Society'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 best management practices.
- The approved RMPAs will be consistent with the BLM's National Sage-Grouse Conservation Strategy.
- The approved RMPAs will comply with FLPMA, NEPA, and Council on Environmental Quality (CEQ) regulations at 40 Code of Federal Regulations (CFR), Parts 1500 – 1508; on the Department of the Interior's regulations at 43 CFR, Part 46, and 43 CFR, Part 1600; on the BLM H-1601-I Land Use Planning Handbook, "Appendix C: Program-Specific and Resource-Specific Decision Guidance Requirements" (as amended) for affected resource programs; on

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

- The RMPAs will be limited to making land use planning decisions specific to the conservation of GRSG habitat.
- The BLM will consider allocations and prescriptive standards to conserve GRSG habitat, as well as objectives and management actions to restore, enhance, and improve GRSG habitat.
- The RMPAs will recognize valid existing rights.
- Lands addressed in the RMPAs will be BLM-administered lands (including surface-estate and split-estate lands) in GRSG habitat. Any decisions in the RMPAs/revisions will apply only to BLM-administered lands.
- The BLM will use 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 will strive to ensure that conservation measures are as consistent as possible with other planning jurisdictions within the planning area boundaries.
- The BLM will consider 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 will analyze socioeconomic impacts of the alternatives, using an accepted input-output quantitative model, such as IMPLAN.
- The BLM will endeavor to use current scientific information, research, technologies, and 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 will follow existing land health standards. Guidelines for livestock grazing and other programs will be applicable to all alternatives for BLM-administered lands.
- The BLM will consult with Native American tribes to identify sites, areas, and objects important to their cultural and religious heritage within GRSG habitats.
- The BLM will coordinate with state, local, and tribal governments to ensure that it considers provisions of pertinent plans, seeks to resolve inconsistencies between state, local, and tribal plans, and provides ample opportunities for state, local, and tribal governments to comment on the development of amendments or revisions.

- The BLM will develop vegetation management objectives, including objectives for managing noxious weeds and invasive species, including identifying the desired future condition for specific areas, within GRSG habitat.
- The RMPAs will be based on the principles of adaptive management.
- The RMPAs will be developed using an interdisciplinary approach 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 will be supported by current metadata and will be used to ascertain GRSG habitat extent and quality. Data will be consistent with the principles of the Information Quality Act of 2000.
- State game and fish agencies' GRSG data and expertise will be used to the fullest extent in making management determinations on federal lands.
- Analysis of impacts in the plan amendments will address the resources and resource programs identified in the NTT report (A Report on National Greater Sage-Grouse Conservation Measures; NTT 2011) and alternatives that contain specific management measures for conservation of GRSG habitat.
- Resources and resource programs that do not contain specific management direction for GRSG that may be indirectly affected by proposed management actions will be identified and discussed only to the degree required to fully understand the range of effects of the proposed management actions.

An additional criterion was received in public scoping comments during the scoping period (December 9, 2011, to March 23, 2012) and was added to the list of planning criteria. The comment was that state game and fish agencies have the responsibility and authority to manage wildlife.

## **ES.7 MANAGEMENT ALTERNATIVES**

Alternatives development is the heart of the planning process. Land use planning and NEPA regulations require the BLM to formulate a reasonable range of alternatives. Alternatives development is guided by established planning criteria (as outlined in 43 CFR Part 1610).

The basic goal of alternatives development is to produce feasible, distinct, potential management scenarios that:

- Address the identified major planning issues

- Explore opportunities to enhance management of resources and resource uses
- Resolve conflicts among resources and resource uses
- Meet the purpose of and need for the RMP or RMPA

Between May and September 2012, the planning team met to develop management goals and to identify objectives and actions to address the goals. The various groups and cooperating agencies met numerous times throughout this period to refine their work. Through this process, the planning team developed one no action alternative (A) and three preliminary action alternatives (B, C, and D). The action alternatives were designed to

- Address the 10 planning issues (see **Section 1.6.3**, Issues Identified)
- Fulfill the purpose and need for the RMPA (outlined in **Section 1.2**, Purpose and Need)
- Meet the multiple use mandates of FLPMA

The three resulting action alternatives (Alternatives B, C, and D) offer a range of possible management approaches. Their purpose is to respond to planning issues and concerns identified through public scoping and to maintain or increase GRSG abundance and distribution in the planning area. While the goal is the same across alternatives, each alternative contains a discrete set of objectives, allowable uses, and management actions constituting a separate RMPA. The goal is met to varying degrees, with the potential for different long-range outcomes and conditions. Conservation measures in the alternatives focus on PH and GH areas, depending on the alternative's objective. The PH and GH have been delineated by the MFWP, in coordination with the BLM.

The relative emphasis given to particular resources and resource uses differs as well, including allowable uses, restoration measures, and specific direction pertaining to individual resource programs. When resources or resource uses are mandated by law or are not tied to planning issues, there are typically few or no distinctions between alternatives.

The alternatives are directed toward responding to USFWS-identified issues and threats to GRSG and their habitat. All of the action alternatives were developed to employ resource programs to address the USFWS-identified threats. A complete description of all decisions proposed for each alternative is in **Chapter 2**. Summaries of the alternatives are presented below and maps are included in **Appendix A**.

#### **ES.7.1 Alternative A (No Action)**

Alternative A meets the CEQ requirement that a no-action alternative be considered. This alternative continues current management direction and

prevailing conditions derived from existing planning documents. Goals and objectives for resources and resource uses are based on the Judith Resource Area Resource Management Plan and the Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision, along with associated amendments, activity and implementation level plans. It is also based on other management decision documents; laws, regulations, and BLM policies that supersede RMP decisions would apply.

No PH or GH would be delineated under Alternative A. Goals and objectives for BLM-administered lands and mineral estate would not change. Appropriate and allowable uses and restrictions pertaining to activities such as mineral leasing and development, recreation, construction of utility infrastructure, and livestock grazing would also remain the same. The BLM would not modify existing or establish additional criteria to guide the identification of site-specific use levels for implementation activities.

### **ES.7.2 Elements Common to Action Alternatives B, C, and D**

All action alternatives include two basic components: delineated PH and GH and required design features (RDF).

#### ***Delineate Lands as Priority and General Habitat***

Under Alternatives B, C, and D, PPH and PGH data would be refined for two purposes. First, it would delineate PH and analyze actions within PH to conserve GRSG habitat functionality, or where possible, improve habitat functionality. Second, it would delineate GH and analyze actions within GH that provide for major life history function (e.g., breeding, migration, and winter survival) in order to maintain genetic diversity to sustain GRSG populations. The areas delineated as PH and GH would be the same under each alternative; however, the allowable uses and management actions within PH and GH may vary between alternatives to meet the goal of the RMPA and objectives of the alternative.

#### ***Required Design Features***

RDFs are means, measures, or practices intended to reduce or avoid adverse environmental impacts. This RMPA/EIS proposes a suite of design features that would establish the minimum specifications for certain activities—water developments, mineral development, and fire and fuels management—and would mitigate adverse impacts. These RDFs would provide a greater level of regulatory certainty than through implementation of best management practices.

In general, the RDFs are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed except at the project-specific level, when the project location and design are known. Because of site-specific circumstances, some features may not apply to some projects (e.g., a resource is not present on a given site) or may require slight variations from what is described in the RMPA/EIS (e.g., a larger or smaller protective area). All

variations in design features would require appropriate analysis and disclosure as part of future project authorizations. Additional mitigation measures may be identified and required during individual project development and environmental review. The proposed RDFs are presented in **Appendix C**, Required Design Features and Best Management Practices for Greater Sage-Grouse Habitat for Alternatives B and C, and **Appendix D**, Required Design Features and Best Management Practices for Greater Sage-Grouse Habitat for Alternative D.

### **ES.7.3 Alternative B**

GRSG conservation measures in *A Report on National Greater Sage-Grouse Conservation Measures* (NTT 2011) were used to form BLM management direction under Alternative B. Management actions by the BLM, in concert with other state and federal agencies, and private landowners play a critical role in the future trends of GRSG populations. To ensure that BLM management actions are effective and are based on the best available science, the National Policy Team created a National Technical Team (NTT) in August of 2011. The BLM's objective for chartering this planning strategy was to develop new or revised regulatory mechanisms, through RMPs, to conserve and restore GRSG and its habitat on BLM-administered lands range-wide over the long term. Conservation measures under Alternative B are focused on PH (areas that have the highest conservation value to maintaining or increasing GRSG populations). These conservation measures would include such protections as right-of-way exclusion.

### **ES.7.4 Alternative C**

During scoping for the National Greater Sage-Grouse Planning Strategy, individuals and conservation groups submitted management direction recommendations for protecting and conserving GRSG and habitat at the range-wide level. The recommendations, in conjunction with resource allocation opportunities and internal subregional BLM input, were reviewed to develop BLM management direction for GRSG under Alternative C. Conservation measures under Alternative C are focused on both PH and GH areas (seasonal or year-round habitat outside of PH).

### **ES.7.5 Alternative D (Agency Preferred)**

Alternative D, the agency-preferred alternative, seeks to allocate limited resources among competing human interests and land uses and the conservation of natural resource values. It would do this while sustaining and enhancing ecological integrity across the landscape, including plant, and wildlife habitat. This alternative incorporates local adjustments to *A Report on National Greater Sage-Grouse Conservation Measures* and habitat boundaries. This is to provide a balanced level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses. Conservation measures under Alternative D are focused on both PH and GH.

## ES.8 ENVIRONMENTAL CONSEQUENCES

The purpose of the environmental consequences analysis in this RMPA/EIS is to determine the potential for significant impacts of the federal action on the human environment. CEQ regulations for implementing NEPA state that the human environment is interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 CFR, Part 1508.14). The federal action is the BLM's selection of an RMPA that will provide a consistent framework for managing the GRSG and its habitat on BLM-administered lands. This would be done in concert with its allocation of resources, in accordance with the multiple-use and sustained yield mandates of FLPMA.

Management actions proposed in **Chapter 2** are primarily planning-level decisions and typically would not result in direct on-the-ground changes. However, by planning for uses on BLM-administered surface estate and federal mineral estate during the planning horizon for the Judith Resource Area Resource Management Plan and Headwaters Resource Management Plan, this impact analysis focuses on impacts that could eventually result in on-the-ground changes. Impacts for some resources or resource uses, such as livestock grazing and off-highway vehicle use, could be confined to the BLM-administered surface estate. Other impacts, such as energy and minerals and requirements to protect GRSG from such activity, could apply to all BLM-administered federal mineral estate (including split-estate). Some BLM management actions may affect only certain resources under certain alternatives. This impact analysis in **Chapter 4, Environmental Consequences**, identifies impacts that may enhance or improve a resource as a result of management actions, as well as those impacts that could impair a resource.

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CHAPTER I  
INTRODUCTION



# CHAPTER I

## INTRODUCTION

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### I.1 INTRODUCTION

The Federal Land Policy and Management Act of 1976 (FLPMA) directs the United States 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.

In March 2010, the US Fish and Wildlife Service (USFWS) published its listing decision for the Greater Sage-Grouse (GRSG) as “warranted but precluded” (75 *Federal Register* 13910, March 23, 2010). Inadequacy of regulatory mechanisms was identified as a major threat in the USFWS finding on the petition to list the GRSG under the Endangered Species Act (ESA). The USFWS has identified conservation measures in RMPs as the principal regulatory mechanism for protecting GRSG on BLM-administered lands. Based on the identified threats to the GRSG and the USFWS’s timeline for making a listing decision on this species, the BLM needs to incorporate objectives and adequate conservation measures into RMPs to conserve GRSG and avoid the potential of listing as a threatened or endangered species under the ESA. In response to the USFWS findings, the BLM will evaluate the adequacy of its RMPs and will address, as necessary, amendments and revisions to RMPs throughout the range of the GRSG.

Consistent with its national policy, the BLM is preparing several environmental impact statements (EISs), with associated plan amendments. These documents will address a range of alternatives focused on specific conservation measures across the range of the GRSG. Several on-going RMP revisions will also be addressing specific conservation measures. The plan amendments will be coordinated under two administrative planning regions across the entire range of the GRSG. The Rocky Mountain Region and the Great Basin Region boundaries are drawn roughly to correspond with the threats identified by the USFWS in the 2010 listing decision, along with the Western Association of Fish

and Wildlife Agencies (WAFWA) management zones framework (Stiver et al. 2006). The management zones reflect ecological and biological issues and similarities. In addition, management challenges within management zones are similar, and GRSG and their habitats are likely responding similarly to environmental factors and management actions. The Rocky Mountain Region consists of land use plans in North Dakota, South Dakota, Wyoming, Colorado, and portions of Montana and Utah. The Great Basin Region consists of land use plans in California, Nevada, Oregon, Idaho, and portions of Utah and Montana.

As identified above, this change in direction is the result of the March 2010 publication of the USFWS 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered. In this document, the agency concluded that the GRSG is warranted for listing as a threatened or endangered species. The USFWS reviewed the status and threats to the GRSG in relation to the five listing factors provided in Section 4(a)(1) of the ESA. The USFWS determined that Factor A, “the present or threatened destruction, modification, or curtailment of the habitat or range of the Greater Sage-Grouse,” and Factor D, “the inadequacy of existing regulatory mechanisms,” both posed “a significant threat to the Greater Sage-Grouse now and in the foreseeable future” (75 *Federal Register* 13910, March 23, 2010). This plan amendment, along with the other plans cited above, proposes to address both Listing Factors A and D (above) and proposes to provide consistency in the management of GRSG habitat.

This plan amendment addresses GRSG habitat within the Lewistown Field Office (LFO). This habitat has been preliminarily mapped by the BLM Montana State Office in coordination with Montana Fish, Wildlife, and Parks (MFWP). GRSG habitat falls into one of the two following categories:

- **Preliminary priority habitat (PPH)**—Areas that have been identified as having the highest conservation value to maintaining sustainable GRSG populations. These areas include breeding, late brood-rearing, and winter concentration areas
- **Preliminary general habitat (PGH)**—Areas of seasonal or year-round habitat outside of priority habitat

Through the land use planning process and plan amendment, the BLM will refine PPH and PGH data to (1) delineate priority habitat (PH) and analyze actions within PH areas to conserve GRSG habitat functionality, or where possible, improve habitat functionality; and (2) identify general habitat (GH) areas and analyze actions within GH areas that provide for major life history function (e.g., breeding, migration, or winter survival) in order to maintain genetic diversity needed for sustainable GRSG populations.

Range-wide, approximately 51 percent of sagebrush habitat within GRSG management zones is BLM-administered land; within the LFO, approximately 16

percent of sagebrush habitat is on BLM-administered lands. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations that are anticipated across the species' range. Range-wide, conservation measure, in the form of land use decisions will focus on areas affected by threats. Examples of these threats are wildfire, energy development, disease, and infrastructure development, depending on the threats identified for each subregion within the Rocky Mountain and Great Basin regions. The BLM administers a large portion of GRSG habitat within the affected states, because of this, changes in its management of GRSG habitats is anticipated to have a considerable impact on existing GRSG populations across the range of GRSG.

## **I.2 PURPOSE AND NEED**

The BLM is preparing RMP amendments and revisions with associated EISs for RMPs containing GRSG habitat. This effort responds to the USFWS's March 2010 "warranted, but precluded" ESA listing petition decision. Inadequacy of regulatory mechanisms was identified as a significant threat in the USFWS finding on the petition to list the GRSG. The USFWS identified the principal regulatory mechanism for the BLM as conservation measures embedded in RMPs. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations that are anticipated across the species' range. These plan amendments and revisions (BLM plans being amended or revised across the entire GRSG range) would focus on areas affected by threats to GRSG habitat identified by the USFWS in the March 2010 listing decision. A threats cross-walk table is included in **Chapter 2**, Proposed Action and Alternatives, to show what threats are being addressed in the range of alternatives for this RMPA/EIS.

The purpose for the RMP amendments and revisions is to identify and incorporate appropriate conservation measures to conserve, enhance and/or restore GRSG habitat by reducing, eliminating, or minimizing threats to that habitat.

Because BLM administers a large portion of GRSG habitat within the affected states, changes in BLM management of GRSG habitats are anticipated to have a considerable beneficial impact on present and future GRSG populations and could reduce the need to list the species as threatened or endangered under the ESA.

## **I.3 PROPOSED ACTION**

This proposed Lewistown Field Office Greater Sage-Grouse Resource Management Plan Amendment (RMPA)/EIS provides future management direction to maintain or increase GRSG abundance and distribution by conserving, enhancing, or restoring the sagebrush ecosystem on which populations depend throughout the LFO portion of WAFWA Management Zones (MZ) 1 and 4 (Stiver et al. 2006). MZ 1 includes all of Montana (except the Dillon Field Office), North Dakota, South Dakota, and northeastern

Wyoming. Additionally, a small portion of MZ 4 is within the LFO in Meagher County. The portions of MZs 1 and 4 within the LFO are analyzed as part of this RMPA/EIS.

The planning area is currently managed under the Judith Resource Area Resource Management Plan (BLM 1994) and the Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision (ROD; BLM 1984). There is an existing protest resolution decision affecting lands managed within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PPH and PGH, or PH and GH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS. *(The LFO RMP revision process will begin in 2013, which will address oil and gas leasing for the entire LFO planning area boundary.)*

The Lewistown Field Office Greater Sage-Grouse RMPA/EIS would amend both of these RMPs. Proposed amendments include allowable uses and management actions for select resources and resource uses. Allowable uses indicate which uses are allowed, restricted, or prohibited and may include stipulations. Allowable uses also identify lands where specific uses are excluded to protect resource values. Management actions include management measures that will guide future and day-to-day activities to conserve GRSG and GRSG habitat. In addition, this RMPA would include identifying required design features (RDFs) and best management practices (BMPs). Implementation decisions generally constitute site-specific on-the-ground actions and are not addressed in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

The decisions to be made are (1) to delineate PH and GH and (2) to identify the management actions, restrictions, and constraints that would be placed on allowable uses on BLM-administered lands to conserve, restore, and enhance GRSG habitat.

## **I.4 DESCRIPTION OF THE GREATER SAGE-GROUSE PLANNING AREA**

### **I.4.1 Overview**

The planning area for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS is in Chouteau, Fergus, Judith Basin, Meagher, and Petroleum counties in central Montana. These lands are either private or are administered by the BLM; the US Department of Agriculture (USDA), Forest Service (Forest Service); the USFWS; the US Department of Defense; or the State of Montana (**Table I-1**, Land Ownership within the Planning Area). **Figure I-1**, Project Planning Area, in **Appendix A**, Figures, is a map of the planning area.

**Table I-1  
Land Ownership within the Planning Area**

	Chouteau County		Fergus County		Judith Basin County		Meagher County		Petroleum County		Planning Area Acres <sup>1</sup>	Planning Area		
	PPH Acres	PGH Acres	PPH Acres	PGH Acres	PPH Acres	PGH Acres	PPH Acres	PGH Acres	PPH Acres	PGH Acres		Non-Habitat Acres		
<b>Surface Ownership</b>														
BLM <sup>2</sup>	0	18,696	83,148	55,855	0	3,692	0	439	150,071	33,659	593,995	233,219	112,341	248,435
Other Federal	0	0	113	2	0	0	0	1,626	3,575	89	1,010,816	3,688	1,717	1,005,411
State Lands	0	11,787	54,903	21,234	0	2,129	0	36,031	35,684	12,257	526,504	90,587	83,438	352,479
Private	0	107,728	506,694	275,159	0	25,627	0	265,747	371,477	142,608	5,168,165	878,171	816,869	3,473,125
Water	0	573	0	0	0	0	0	0	2,329	97	12,039	2,329	670	9,040
<b>Total</b>	<b>0</b>	<b>138,784</b>	<b>644,858</b>	<b>352,250</b>	<b>0</b>	<b>31,448</b>	<b>0</b>	<b>303,843</b>	<b>563,136</b>	<b>188,710</b>	<b>7,311,519</b>	<b>1,207,994</b>	<b>1,015,035</b>	<b>5,088,490</b>
<b>Federal Mineral Estate<sup>3</sup></b>														
All Minerals	0	30,202	102,760	80,304	0	6,679	0	11,910	166,428	43,932	820,108	269,189	173,027	367,480
Other	0	4,231	100,074	65,417	0	260	0	4,417	16,430	6,882	293,733	124,635	82,293	99,239
<b>Total</b>	<b>0</b>	<b>34,433</b>	<b>202,834</b>	<b>145,721</b>	<b>0</b>	<b>6,939</b>	<b>0</b>	<b>16,327</b>	<b>182,858</b>	<b>50,814</b>	<b>1,509,263</b>	<b>393,824</b>	<b>255,320</b>	<b>466,719</b>

Source: BLM 2012a

<sup>1</sup>Planning area acres include PPH, PGH, and non-habitat.<sup>2</sup>For the purpose of this planning process, all BLM-administered lands have subsurface minerals.<sup>3</sup>These terms are derived primarily from master title plats and indicate what minerals are reserved by the federal government.

The planning area incorporates the PPH, PGH and additional lands not considered GRSG habitat. Though the planning area includes private lands, decisions are made only for BLM-administered federal surface and federal minerals in this RMPA. Management direction and actions outlined in this EIS apply only to these BLM-administered lands in the planning area and to federal mineral estate under BLM jurisdiction that may lie beneath other surface ownership. Unlike other RMPAs that are part of the National Greater Sage-Grouse Planning Strategy, the Lewistown Field Office Greater Sage-Grouse RMPA/EIS does not address a range of alternatives for Forest Service surface/federal minerals. The Lewis & Clark National Forest is a cooperating agency; however, they have had minimal involvement in the planning process as the planning area does not include any Forest Service land that is considered GRSG habitat.

The current GRSG habitat on BLM-administered lands in the LFO consists of 233,219 acres of PPH (20 percent of all PPH in the planning area) and 112,341 acres of PGH (11 percent of all PGH in the planning area). PPH and PGH were mapped in cooperation with the MFWP. **Table I-1** provides acres of PPH and PGH by landowner, and **Figure I-1 (Appendix A)** includes areas mapped as PPH and PGH.

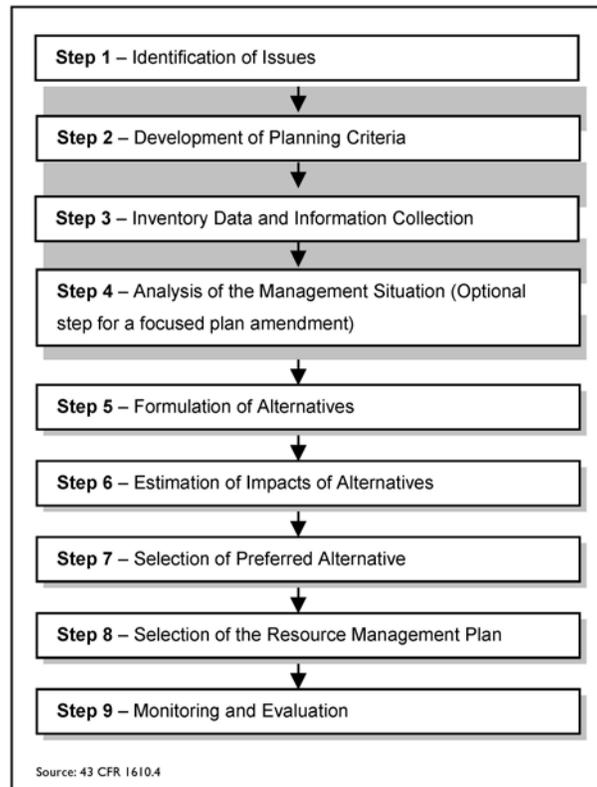
## **I.5 BLM PLANNING PROCESS**

FLPMA requires the BLM to use RMPs as tools by which “present and future use is projected” (43 United States Code [USC], Section 1701 [a][2]). FLPMA’s implementing regulations for planning, 43 Code of Federal Regulations (CFR), Part 1600, state that land use plans are a preliminary step in the overall process of managing BLM-administered lands. The regulations state that the plans are “designed to guide and control future management actions and the development of subsequent, more detailed and limited scope plans for resources and uses” (43 CFR, Part 1601.0-2). Public participation and input are important components of land use planning.

The BLM uses a nine-step planning process (**Diagram I-1**, Nine-Step Planning Process) when developing or revising RMPs, as required by 43 CFR, Part 1600, and planning program guidance in the BLM Handbook H-1601-1, *Land Use Planning Handbook* (BLM 2005a). The planning process is designed to help the BLM identify the uses of BLM-administered lands desired by the public and to consider these uses to the extent they are consistent with the laws established by Congress and the policies of the executive branch of the federal government.

Once an RMP is approved, a plan may be changed through an amendment. An amendment is initiated by the need to consider monitoring and evaluation findings, new data, new or revised policy, a change in circumstances or a proposed action that may result in a change in the scope of resource uses or a change in the terms, conditions, and decisions of the approved plan. If a decision

**Diagram I-1  
Nine-Step Planning Process**



is made to prepare a National Environmental Policy Act (NEPA) document, the amending process would follow the same procedure required for preparing and approving the plan, but the focus would be limited to that portion of the plan being amended (43 CFR, Part 1610.5-5).

The planning process is issue driven and is undertaken to resolve management issues and problems, as well as to take advantage of management opportunities. The BLM uses the public scoping process to identify planning issues to revise or modify an existing plan. The scoping process (see **Section 1.6.1**, The Scoping Process) is also used to introduce the public to preliminary planning criteria, which set the parameters for conducting the planning process.

### **1.5.1 Implementation of Land Use Plans**

When an approved land use plan or land use plan amendment decision document is signed, most of the land use plan decisions in the plan are effective immediately and require no additional planning or NEPA analysis. Upon approval of the land use plan, subsequent implementation decisions are put into effect by developing activity-level or project-specific implementation plans. An activity-level plan typically describes multiple projects in detail that will lead to on-the-ground action. These plans traditionally focused on single resource programs (e.g., habitat management plans, allotment management plans (AMPs), and

RMPs). Implementation decisions are made with the appropriate level of NEPA analysis along with any procedural and regulatory requirements for individual programs.

The BLM develops strategies to facilitate implementation of land use plans. An implementation strategy lists prioritized decisions that will help achieve the desired outcomes of one or more land use plans and can be implemented given existing or anticipated resources. Developing implementation strategies enables the BLM to prioritize the preparation of implementation decisions. Implementation strategies can include such steps as: (1) developing a framework to portray the work; (2) identifying priorities for a given timeframe; (3) developing a budget for a given timeframe; (4) and developing an outreach strategy to support implementation.

### **1.5.2 Monitoring**

The regulations in 43 CFR 1610.4-9 require that land use plans establish intervals and standards for monitoring, based on the sensitivity of the resource decisions involved. Land use plan monitoring is the process of tracking the implementation of land use planning decisions (implementation monitoring) and collecting data/information necessary to evaluate the effectiveness of land use planning decisions (effectiveness monitoring). The level and intensity of monitoring will vary, depending on the sensitivity of the resource or area and the scope of the proposed management activity. See **Section 2.6**, Monitoring for the Greater Sage-Grouse Planning Strategy, and **Appendix B**, Greater Sage-Grouse Draft Monitoring Framework, for more information related to monitoring in Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

## **1.6 SCOPING AND IDENTIFICATION OF ISSUES**

### **1.6.1 The Scoping Process**

Scoping is an early and open process for determining the scope, or range, of issues to be addressed and for identifying the significant issues to consider in the planning process. Scoping is designed to meet the public involvement requirements of FLPMA and NEPA. It identifies the affected public and agency concerns and defines the relevant issues and alternatives that will be examined in detail in the RMPA. A planning issue is defined as a major controversy or dispute regarding management or uses on BLM-administered lands that can be addressed through a range of alternatives.

A 60-day public scoping period was initiated on December 9, 2011, with the publication in the *Federal Register* of a notice of intent to begin planning. The scoping period was extended through a notice of extension published February 10, 2012; the period ended on March 23, 2012. This cooperative process included soliciting input from interested state and local governments, tribal governments, other federal agencies and organizations, and individuals to identify the scope of issues to be addressed in the RMPA and to assist in the

formulation of reasonable alternatives. The scoping process is an excellent method for opening dialogue between the BLM and the public about managing GRSG and its habitats on BLM-administered lands. The process also identifies the concerns of those who have an interest in this subject and in the GRSG habitats. As part of the scoping process, the BLM also requested that the public submit nominations for potential Areas of Critical Environmental Concern (ACECs) for GRSG and their habitat.

Scoping included an open-house meeting in Lewistown, Montana, on January 10, 2012. In addition, news releases were used to notify the public regarding the scoping period and to invite the public to provide written comments. Public comments obtained during the scoping period were used to define the relevant issues that would be addressed by a reasonable range of alternatives in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

The *National Greater Sage-Grouse Planning Strategy Scoping Summary Report* (BLM 2012b) is available at the project website for the national conservation effort at <http://www.blm.gov/wo/st/en/prog/more/sagegrouse.html>. The discussion below provides an overview of the scoping results, both range-wide and specific to eastern Montana.

### **1.6.2 Scoping Comments**

During the public scoping period, the BLM received 272 unique written submissions for the Rocky Mountain Region (which includes eastern Montana) and 585 unique written submissions for the Great Basin Region. Submissions resulted in 7,472 unique comments; in addition, 30,397 form letters were received.

In the Greater Sage-Grouse Scoping Summary Report, the comments that pertain to the LFO are listed in the eastern Montana section. Out of the 7,472 unique comments received, only 67 were specific to eastern Montana.

#### ***Commenter Affiliation***

Individual members of the public submitted 50 percent of the comments specific to eastern Montana; representatives from the commercial sector accounted for eight percent of the commenters and nonprofit or citizen groups represented 33 percent. Local government agencies represented eight percent of commenters; federal and state agencies submitted no comments.

#### ***Number of Comments by Process Category***

Of the 67 comments received specific to eastern Montana, 52 (85 percent) were related to a planning issues that are addressed in the RMPA. These issues are summarized below (**Section 1.6.3, Issues Identified**) and are discussed in Chapter 3, Issue Summary, of the Scoping Summary Report. It should be noted that some comments addressed multiple planning issues. In addition, nine comments (15 percent) were related to issues that will be addressed in the EISs but do not fall within a specific planning issue category. These were general

comments on the BLM planning process, alternatives development, collaboration, and requirements of NEPA and other regulations. The remaining six comments were on issues that are beyond the scope of the EISs (four comments, 67 percent) and issues that will be resolved through national policy or administrative action (two comments, 33 percent).

### I.6.3 Issues Identified

Issues to be addressed in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS were identified by the public and the agencies during the scoping process for the range-wide planning effort. The issues identified in the Scoping Summary Report and other resource and use issues identified in the *BLM Planning Handbook and Manual (H-1610-1)* were considered in developing the alternatives brought forward for analysis. Range-wide issues identified in the Scoping Summary Report that are applicable for the LFO are included in **Table I-2, Range-Wide Planning Issues for the Lewistown Field Office.**

**Table I-2**  
**Range-Wide Planning Issues for the Lewistown Field Office**

<b>Issue</b>	<b>Planning Issue Category</b>	<b>Planning Issue</b>
1.	Greater Sage-Grouse and habitat	How would the BLM use the best available science to designate PPH, PGH, and no-habitat categories and accurately monitor the impact of land uses on GRSG?
2.	Energy and mineral development	How would energy and mineral development, including renewable energy, be managed within GRSG habitat, while recognizing valid existing rights?
3.	Livestock grazing	What measures would the BLM put into place to protect and improve GRSG habitat while maintaining permitted grazing use?
4.	Vegetation management	How would the BLM conserve, enhance, or restore GRSG habitat, such as sagebrush communities, and minimize or prevent the introduction or spread of noxious weeds and invasive species?
5.	Lands and realty	What opportunities exist to adjust public land ownership that would increase management efficiency for GRSG and habitat?
6.	Social, economic, and environmental justice	How could the BLM promote or maintain activities that provide social and economic benefit to local communities, while providing protection for GRSG habitat?
7.	Recreation and travel management	How would motorized, nonmotorized, and mechanized travel be managed to provide access to federal lands and a variety of recreation opportunities, while protecting GRSG habitat?
8.	Fire management	What measure should be undertaken to manage fuels and wildland fires, while protecting GRSG habitat?
9.	Special management areas	What special management areas would the BLM designate to benefit the conservation, enhancement, and restoration of GRSG and habitat?

**Table I-2**  
**Range-Wide Planning Issues for the Lewistown Field Office**

<b>Issue</b>	<b>Planning Issue Category</b>	<b>Planning Issue</b>
10.	Drought/climate change	How would the BLM incorporate the impacts of a changing climate on GRSG habitat?

***Issues Specific to Lewistown Field Office***

Issues discussed in the comments for the LFO included GRSG habitat, energy and mineral development, livestock grazing, fish and wildlife, social and economic concerns, vegetation management, recreation and travel management, and special management areas. No additional unique comment themes were identified outside of the issues identified in the range-wide analysis (**Table I-2**).

**1.6.4 Issues Considered but Not Further Analyzed**

***National Policy or Administrative Action***

Policy or administrative actions are those that the BLM implements because they are standard operating procedure, because federal law requires them, or because they are BLM policy. They are, therefore, issues that are eliminated from detailed analysis in this planning effort. Administrative actions do not require a planning decision to implement.

The following issues were determined to be outside the scope of the range-wide planning effort, including the Lewistown Field Office Greater Sage-Grouse RMPA/EIS:

- **Hunting sage-grouse**—Many commenters questioned why GRSG hunting is allowed if the bird is in need of protection. Hunting is an allowed use on BLM-administered lands and is regulated by MFWP; these comments therefore relate to state-regulated actions and are outside the scope of the RMPA.
- **Predator control**—Many commenters stated that predator control was needed to protect GRSG from predation. The State of Montana possesses primary authority and responsibility for managing wildlife within the state, while the BLM is responsible for managing habitat. Consistent with a memorandum of understanding (MOU) between the BLM and the USDA, Animal and Plant Health Inspection Service-Wildlife Services, the BLM would continue to work with the MFWP and USDA Wildlife Services to meet state wildlife population objectives. Predator control is allowed on BLM-administered lands and is regulated by MFWP; these comments therefore relate to state-regulated actions and are outside the scope of the RMPA. The BLM will continue to work with agencies,

such as MFWP, to address current predation of GRSG. The BLM-administered lands in the planning area will remain open to predator control under state laws.

- **Warranted but precluded decision**—Commenters questioned population levels and the need to incorporate range-wide conservation measures. Others questioned the effectiveness of ESA listing as a method of species conservation. These comments relate to decisions under the purview of the USFWS and are not addressed in this RMPA.
- **Elimination of livestock grazing**—Commenters asked that grazing be limited or completely stopped on all National System of Public Lands administered by the BLM due to detrimental ecosystem effects. Others stated that national grazing policies should be reformed as the requirements are too limiting and impact ranchers' livelihoods. In addition, some commenters state that grazing provides habitat enhancements for certain sensitive species. Decisions about livestock grazing national policies are outside the scope of this RMPA and are not made in this planning effort.

However, for the purposes of this document, the removal of livestock in all PH and GH within the planning area (i.e., no authorized livestock grazing) is considered in Alternative C. This is consistent with Instruction Memorandum (IM) 2012-169, *RMP Alternative Development for Livestock Grazing* (BLM 2012c). Note that this document is specific to PPH and PGH, not an entire planning area. Additionally, IM MT-2012-042, *Guidance to Address Alternative Development in Livestock Grazing Permit Renewals*, directs the BLM in Montana to analyze a no grazing alternative as part of the grazing permit renewal process (BLM 2012d).

- **Renewable energy policies**—Commenters stated concerns about renewable energy development, including economic instability due to government subsidies and risk of wildlife deaths, specifically bats and birds. General policy decisions about renewable energy management on BLM-administered lands will be determined by national policy and are not addressed in this RMPA.

#### ***Range-Wide Issues not Carried Forward in the Lewistown Field Office Amendment***

The following range-wide issues are not being carried forward in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS:

- **Fluid mineral leasing**—As discussed in **Section 1.3**, Proposed Action, an existing protest resolution decision affecting lands managed within the LFO does not allow oil and gas leasing of nominated parcels that would require a special stipulation to

protect important wildlife values, which includes PPH and PGH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. This RMPA is only considering management actions for GRSG and it will not include consideration of oil and gas leasing options for lands with other important wildlife resource values. Therefore, oil and gas leasing will not be addressed in this RMPA/EIS. (*The LFO RMP revision process will begin in 2013, which will address oil and gas leasing for the entire LFO planning area boundary.*)

- **Fish and wildlife**—GRSG will be addressed under the topic of Greater Sage-Grouse, and other relevant Special Status Species will be addressed under the topic Special Status Species – Other Species of Issue. Fish and wildlife management is not a main issue that would drive alternatives design for this RMPA; however, management activities that impact these resources, such as oil and gas and grazing, are addressed in this EIS.
- **Water and soil**—Soil and water management is not a main issue that would drive alternatives design for this RMPA; however, management activities that impact these resources, such as oil and gas and grazing, are addressed in this EIS.
- **Wild horse and burros**—There are no wild horse and burros, or wild horse and burro herd management areas, in the LFO, so this issue is not relevant to this RMPA.

#### **1.6.5 Issues Beyond the Scope of the Plan**

Issues beyond the scope of the RMP planning process are those not related to decisions that would occur as a result of the planning process, such as issues that address the threats to GRSG. They include decisions that are not under the jurisdiction of the BLM or that are beyond its capability to resolve as part of the RMPA. Issues identified in this category are the following:

- New wilderness or Wilderness Study Area (WSA) proposals
- Elimination of grazing, mineral development, and off-highway vehicle (OHV) use on all public lands
- Activities and uses beyond the jurisdiction of the BLM
- Compensation of private landowners for conservation efforts and off-site mitigation
- Changing existing laws, policies, and regulations
- Availability of funding and personnel for managing programs, and for NEPA procedures and costs

***Lands with Wilderness Characteristics***

The purpose and need of the National Greater Sage-Grouse Planning Strategy is limited to making land use planning decisions specific to the conservation of GRSG habitats. No decisions related to the management of lands with wilderness characteristics will be made as part of this planning effort; therefore, management of lands with wilderness characteristics is considered outside the scope of this RMPA process. As part of the original FLPMA Section 603-mandated inventories, inventories were conducted for the LFO beginning in 1979. The intensive inventories published in the early 1980's resulted in the designation of two WSAs that are located outside of this planning area. No other inventories have been completed for lands with wilderness characteristics since then; however, inventories are currently underway as part of the RMP revision process beginning this year.

***National Historic Trails***

The purpose and need of the National Greater Sage-Grouse Planning Strategy is limited to making land use planning decisions specific to the conservation of GRSG habitats. No decisions related to the management of National Scenic/Historic Trails (NSHT) will be made as part of this planning effort; therefore, management of NSHT is considered outside the scope of this RMPA process. The Nez Perce National Historic Trail is the only NSHT within the planning area. The portion of the trail on BLM-administered lands in the planning area consists of three segments of trail in LFO, totaling two miles of trail route, none being a High Potential Route segment. Management of the trail will continue to be consistent with the Forest Service's Nez Perce (Nee-Me-Poo) National Historic Trail Comprehensive Plan (Forest Service 1990) and BLM's Manual direction for administration and management of National Scenic and Historic Trails (6250; BLM 2012e/6280; BLM 2012f). As part of the LFO RMP revision, a trail corridor will be defined to assist in resource identification and management.

**I.7 DEVELOPMENT OF PLANNING CRITERIA**

Planning criteria are based on appropriate laws, regulations, BLM Manual sections, and policy directives. Criteria are also based on public participation and coordination with cooperating agencies, other federal agencies, state and local governments, and Indian tribes. Planning criteria are the standards, rules, and factors used as the parameters 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 avoids unnecessary data collection and analysis.

- The BLM will use the USFWS's *Greater Sage-grouse (Centrocercus urophasianus) Conservation Objectives: Final Report* (USFWS 2013), WAFWA's *Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats* (Connelly et al. 2004), US Geological Society's (USGS) *Summary of Science, Activities, Programs and Policies that Influence the Rangeland Conservation of Greater Sage-Grouse*

(*Centrocercus urophasianus*) (Manier et al 2013), and any other appropriate resources to identify GRSG habitat requirements and BMPs.

- The approved RMPAs will be consistent with the BLM's National Sage-Grouse Conservation Strategy.
- The approved RMPAs will comply with FLPMA, NEPA, and Council on Environmental Quality (CEQ) regulations at 40 CFR Parts 1500-1508, and DOI regulations at 43 CFR Part 46, and 43 CFR Part 1600; the BLM H-1601-1 Land Use Planning Handbook, "Appendix C: Program-Specific and Resource-Specific Decision Guidance Requirements" (as amended) for affected resource programs; the 2008 BLM NEPA Handbook (H-1790-1; BLM 2008a); and all other applicable BLM policies and guidance.
- The RMPAs will be limited to making land use planning decisions specific to the conservation of GRSG habitat.
- The BLM will consider allocations and prescriptive standards to conserve GRSG habitat, as well as objectives and management actions to restore, enhance, and improve GRSG habitat.
- The RMPAs will recognize valid existing rights.
- Lands addressed in the RMPAs will be BLM-administered lands (including surface-estate/split-estate lands) managed by the BLM in GRSG habitats. Any decisions in the RMPAs and revisions will apply only to BLM-administered lands.
- The BLM will use 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 will strive to ensure that conservation measures are as consistent as possible with other planning jurisdictions within the planning area boundaries.
- The BLM will consider 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 will analyze socioeconomic impacts of the alternatives using an accepted input-output quantitative model, such as IMPLAN.
- The BLM will endeavor to use current scientific information, research, and technologies and results of inventory, monitoring, and coordination to determine appropriate local and regional management strategies that will enhance or restore GRSG habitats.

- For BLM-administered lands, all activities and uses within GRSG habitats will follow existing land health standards. Guidelines for livestock grazing and other programs will be applicable to all alternatives for BLM-administered lands.
- The BLM will consult with Native American tribes to identify sites, areas, and objects important to their cultural and religious heritage within GRSG habitats.
- The BLM will coordinate with state, local, and tribal governments to ensure that it considers provisions of pertinent plans; it will seek to resolve inconsistencies between state, local, and tribal plans and will provide ample opportunities for state, local, and tribal governments to comment on the development of amendments or revisions.
- The BLM will develop vegetation management objectives, including objectives for managing noxious weeds and invasive species and identifying the desired future condition for specific areas, within GRSG habitat.
- The RMPAs will be based on the principles of Adaptive Management.
- The RMPAs will be developed using an interdisciplinary approach 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 will be supported by current metadata and will be used to ascertain GRSG habitat extent and quality. Data will be consistent with the principles of the Information Quality Act of 2000.
- State game and fish agencies' GRSG data and expertise will be used to the fullest extent practicable in making management determinations on federal lands.
- Analysis of impacts in the plan amendments will address the resources and resource programs identified in the National Technical Team (NTT) report (A Report on National Greater Sage-Grouse Conservation Measures; NTT 2011) and alternatives; these contain specific management measures for conservation of GRSG habitat.
- Resources and resource programs that do not contain specific management direction for GRSG that may be indirectly affected by proposed management actions will be identified and discussed only to the degree required to fully understand the range of effects of the proposed management actions.

An additional criterion was received in public scoping comments during the scoping period (December 9, 2011, to March 23, 2012) was added to the list of planning criteria. The comment was that state game and fish agencies have the responsibility and authority to manage wildlife.

## **I.8 RELATIONSHIP TO OTHER POLICIES, PLANS, AND PROGRAMS**

Currently, lands within the planning area are managed according to the Judith Resource Area Resource Management Plan (BLM 1994), as amended, and the Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision (BLM 1984), as amended. This RMPA is a necessary step in the overall process of managing BLM-administered lands, specifically to include new policy for conservation of GRSG habitat. As a result, this planning process must recognize the many ongoing programs, plans, and policies that are being implemented in the planning area by other land managers and government agencies. The BLM will seek to be consistent with other management actions whenever possible. Plans that need to be considered during GRSG planning are listed below.

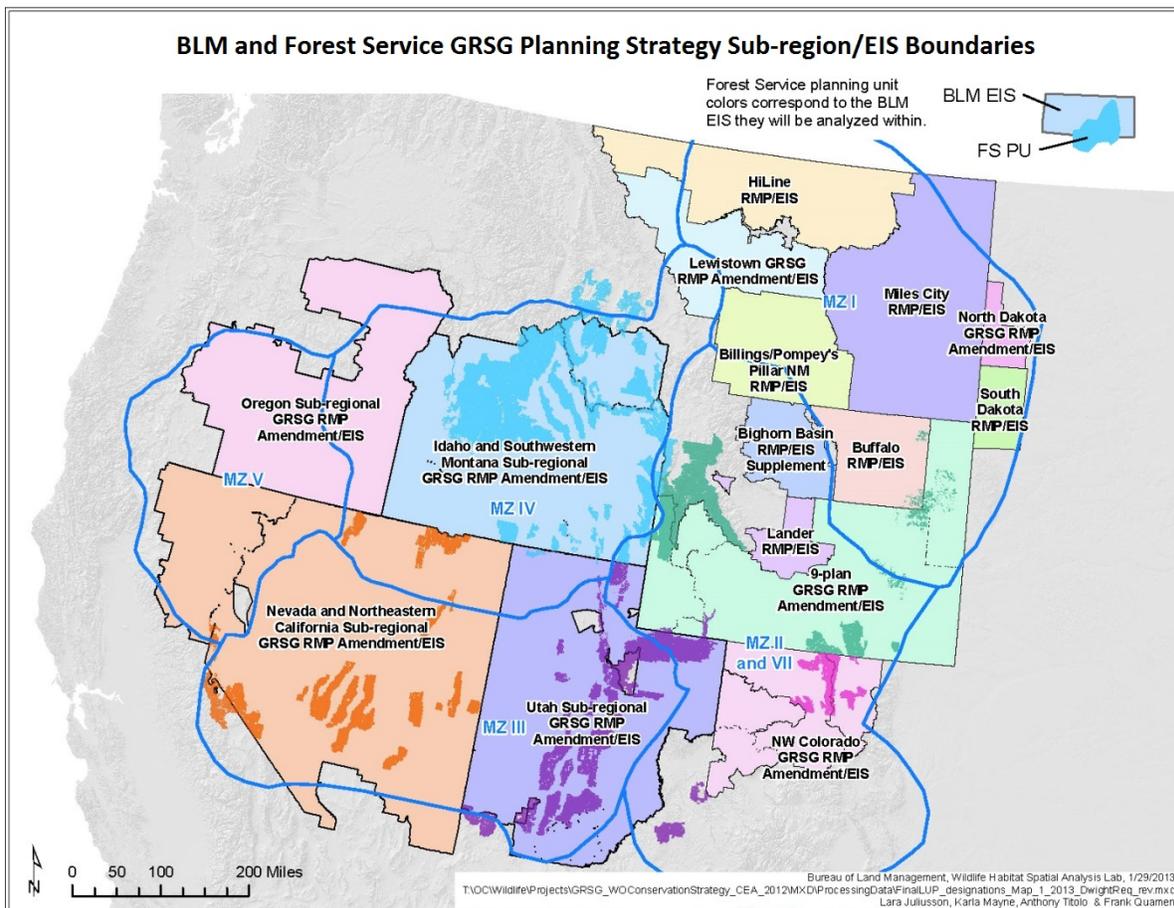
### **I.8.1 National Greater Sage-Grouse Planning Strategy**

On December 9, 2011, a Notice of Availability was published in the *Federal Register* to initiate the GRSG Planning Strategy across nine western states, including Northeast California, Oregon, Nevada, Idaho, Utah, and Southwest Montana in the Great Basin Region and Northwest Colorado, Wyoming, Montana, South Dakota, and North Dakota in the Rocky Mountain Region (see **Diagram I-2**, BLM and Forest Service GRSG Planning Strategy Sub-region/EIS Boundaries). The BLM is the lead agency for this planning effort. On February 10, 2012, the BLM published a Notice of Correction that changed the names of the regions that are coordinating the EISs, extended the scoping period, and added 11 Forest Service land management plans to this process. This Lewistown Field Office Greater Sage-Grouse RMPA/EIS is one of 15 separate EISs that are currently being conducted to analyze and incorporate specific conservation measures across the range of the GRSG, consistent with National BLM policy.

On December 27, 2011, the BLM Washington Office released IM No. 2012-044, which directed all of the planning efforts across the GRSG range to consider all applicable conservation measures when revising or amending its RMPs in GRSG habitat, including the measures developed by the NTT that were presented in their December 2011 document – *A Report on National Greater Sage-Grouse Conservation Measures*. The BLM's IM-2012-044 directs all planning efforts associated with the national strategy to consider and analyze (as appropriate) the conservation measures presented in the NTT Report.

Along with the applicable measures that were outlined in the NTT Report, planning efforts associated with this National GRSG Planning Strategy will also analyze applicable conservation measures that were submitted to the BLM from various state governments and from citizens during the public scoping process.

**Diagram I-2**  
**BLM and Forest Service GRSG Planning Strategy Sub-region/EIS Boundaries**



It is the goal of the BLM to make a final decision on these plans by the end of 2014 so that adequate regulatory mechanisms are integrated into the land use plans before the USFWS makes a listing decision in 2015.

**1.8.2 Instruction Memorandum No. 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures**

This IM provides interim conservation policies and procedures to the BLM field officials to be applied to ongoing and proposed authorizations and activities that affect the GRSG and its habitat (BLM 2012g). This direction ensures that interim conservation policies and procedures are implemented when field offices authorize or carry out activities on BLM-administered land while the BLM develops and decides how to best incorporate long-term conservation measures for GRSG into applicable RMPs. This direction promotes sustainable GRSG populations and conservation of its habitat while not closing any future options in the LFO before the Lewistown Field Office Greater Sage-Grouse RMPA/EIS can be completed.

### **I.8.3 Greater Sage-Grouse (*Centrocercus urophasianus*) Conservation Objectives Final Report**

The USFWS created a Conservation Objectives Team (COT) of state and USFWS representatives to develop range-wide conservation objectives for the GRSG to define the degree to which threats need to be reduced or ameliorated to conserve GRSG so that it is no longer in danger of extinction or likely to become in danger of extinction in the foreseeable future. The Greater Sage-Grouse (*Centrocercus urophasianus*) Conservation Objectives Final Report (released in March 2013) is the outcome of the COT's efforts (USFWS 2013).

This report delineates reasonable objectives, based upon the best scientific and commercial data available at the time of its release, for the conservation and survival of GRSG. The report was prepared to provide additional information for consideration pertinent to future decision making relative to GRSG. The report will also serve as guidance to federal land management agencies, state GRSG teams, and others in focusing efforts to achieve effective conservation for this species.

### **I.8.4 Summary of Science, Activities, Programs and Policies that Influence the Rangewide Conservation of Greater Sage-Grouse (*Centrocercus urophasianus*)**

To augment this planning document at a biologically meaningful scale for GRSG, a Baseline Environmental Report (BER) of GRSG was produced by the USGS for BLM (Manier et. al. 2013). The BER is a science support document that provides information to put planning units and issues into the context of the larger WAFWA Sage-Grouse management zones. The BER examines each threat identified in the USFWS's listing decision published on March 15, 2010. For each threat, the BER summarizes the current, scientific understanding of various impacts to GRSG populations and habitats. When available, the BER also reports patterns, thresholds, indicators, metrics, and measured responses that quantify the impacts of each specific threat.

### **I.8.5 National Level Programmatic EISs and Agreements**

- *Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States* (BLM 1991; common to the Proposed Plan and draft alternatives)
- *Final Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement and Associated Record of Decision* (BLM 2007a)
- *Approved Resource Management Plan Amendments/Record of Decision for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States* (BLM 2009a)
- *Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States* (BLM 2008b)

- *Implementation of a Wind Energy Development Program and Associated Land Use Plan Amendments Record of Decision (BLM 2005b)*
- National-level MOUs

#### **I.8.6 Relevant Plan Amendments**

- *Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas (BLM 2003a)*
- *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management for Montana and the Dakotas Record of Decision (BLM 1997)*

#### **I.8.7 Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota**

In the Montana-Dakotas region, the BLM has limited travel to existing roads and trails since the Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota was signed in 2003 (BLM 2003b). Therefore, travel in the LFO planning area is already managed as limited, and this designation will remain the same among all alternatives in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. The following provides an explanation of the BLM's travel management process and the next steps for travel management once a ROD is signed:

1. Although travel has been limited (e.g., no cross-country travel allowed), additional detailed route inventory information still needs to be collected in order to complete site-specific travel planning once this ROD is signed. This data collection will provide the information needed to fully evaluate the impacts of these routes on other resource allocations, uses and to the public, in addition to the GRSG.
2. Once the inventories are underway and/or completed, the BLM will initiate travel and transportation implementation plans. The plans will undergo a NEPA analysis that includes further public involvement.
3. Through this subsequent NEPA and planning process, the BLM will consider road and trail permanent and seasonal closures, as well as area closures. The decision to close routes or areas (e.g., around leks) to OHV use in the travel and transportation plans would be based on the overall goal of protecting, preserving and enhancing GRSG and their habitats.

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CHAPTER 2  
PROPOSED ACTION AND  
ALTERNATIVES



# CHAPTER 2

## PROPOSED ACTION AND ALTERNATIVES

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### 2.1 INTRODUCTION

This chapter details Alternatives A through D for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. It includes references to maps (**Appendix A**) identifying where actions would be applicable. The proposed alternatives were formulated in response to issues and concerns identified through public scoping. The alternatives are to maintain or increase GRSG abundance and distribution by conserving, enhancing, or restoring the sagebrush ecosystem. Populations of GRSG depend on this ecosystem throughout WAFWA MZs 1 and 4 of the Rocky Mountain Region (Stiver et al. 2006). Decisions in this RMPA pertain to 593,995 acres of BLM-administered land and 639,927 acres of federal subsurface mineral estate, excluding unleased federal fluid mineral estate (refer to **Sections 1.3** and **1.6.4**), in the planning area (shown in **Figure 1-1, Appendix A**). This land is administered by the BLM's LFO.

The No Action Alternative (Alternative A) represents the continuation of current management direction and proposes no new plan or management actions. This alternative is required by CEQ regulations and provides a baseline for comparing the other alternatives (CEQ 1981). The BLM developed the action alternatives (Alternatives B, C, and D) by considering issues and concerns raised during the public scoping period. The BLM also used planning criteria and guidance applicable to managing resources and resource uses relevant to GRSG habitat. Alternatives B, C, and D describe proposed changes to current management, as well as any existing management that would be carried forward. These alternatives provide a range of choices for resolving the planning issues identified in **Chapter 1**.

The BLM recognizes that social, economic, and environmental issues cross land ownership lines, and that extensive cooperation is needed to address issues of mutual concern. To the extent possible, these alternatives were developed using input from public scoping comments and cooperating agencies.

## 2.2 INTRODUCTION TO ALTERNATIVES

Decisions in this RMPA consist of allowable uses and management actions necessary for maintaining or increasing GRSG abundance and distribution on BLM-administered lands. These critical determinations guide future land management actions and subsequent site-specific implementation actions to conserve, enhance, or restore the sagebrush ecosystem in the planning area.

### ***Components of Alternatives***

Goals are broad statements of desired outcomes (RMP-wide and resource- or resource use-specific) and are not quantifiable or measurable. Objectives are specific measurable desired conditions or outcomes intended to meet goals. While the goal for this RMPA is the same across all alternatives, objectives typically vary, resulting in different allowable uses and management actions for some resources and resource uses.

Allowable uses and management actions are designed to achieve objectives. Allowable uses delineate which uses are permitted, restricted, or prohibited and may include restrictions. Allowable uses also identify lands where specific uses are excluded to protect resource values, or where certain lands are open or closed in response to legislative, regulatory, or policy requirements. Management actions are measures that guide day-to-day and future activities. Implementation decisions are site-specific on-the-ground actions and are not addressed in this RMPA.

### ***Purpose of Alternatives Development***

Alternatives development is the heart of the planning process. Land use planning and NEPA regulations require the BLM to formulate a reasonable range of alternatives. Alternatives development is guided by established planning criteria (as outlined in 43 CFR, Part 1610).

The basic goal of alternatives development is to produce distinct potential management scenarios that:

- Address the identified major planning issues
- Explore opportunities to enhance management of resources and resource uses
- Resolve conflicts among resources and resource uses
- Meet the purpose of and need for the RMP or RMPA
- Are feasible

Pursuit of this goal provides the BLM and the public with an appreciation for the diverse ways in which conflicts regarding resources and resource uses might be resolved. It also offers the BLM State Director a reasonable range of alternatives from which to make an informed decision. The components and broad aim of

each alternative considered for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS are discussed below.

## **2.3 ALTERNATIVES DEVELOPMENT PROCESS FOR THE LEWISTOWN FIELD OFFICE GREATER SAGE-GROUSE PLAN AMENDMENT**

The Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning team employed the BLM planning process (outlined in **Section 1.5**) to develop a reasonable range of alternatives for the RMPA. The BLM complied with NEPA and the CEQ implementing regulations at 40 CFR, Part 1500, in developing alternatives for this RMPA/EIS, including seeking public input and analyzing reasonable alternatives. Where necessary to meet the planning criteria, to address issues and comments from cooperating agencies and the public, or to provide a reasonable range of alternatives, the alternatives include management options for the planning area that would modify or amend decisions made in the Judith Resource Area Resource Management Plan (BLM 1994) and the Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision (BLM 1984), as amended. Since this RMPA specifically addresses GRSG conservation, many decisions from the Judith Resource Area Resource Management Plan and the Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision are acceptable and reasonable; in these instances, there is no need to develop alternative management prescriptions.

Public input received during the scoping process was considered to ensure that all issues and concerns would be addressed, as appropriate, in developing the alternatives. The planning team developed planning issues to be addressed in the RMPA. The team based these on broad concerns or controversies related to conditions, trends, needs, and existing and potential uses of planning area lands and resources.

### **2.3.1 Developing a Reasonable Range of Alternatives**

Between May and September 2012, the planning team met to develop management goals and to identify objectives and actions to address the goals. The various groups, along with cooperating agencies, met numerous times throughout this period to refine their work. Through this process, the planning team developed one no action alternative and three preliminary action alternatives. The action alternatives were designed to:

- Address the 10 planning issues (refer to **Section 1.6.3**)
- Fulfill the purpose and need for the RMPA (outlined in **Section 1.2**)
- Meet the multiple use mandates of FLPMA (43 USC, Section 1732).

## **2.4 RESULTING RANGE OF ALTERNATIVES**

The three resulting action alternatives offer a range of possible management approaches for responding to planning issues and concerns. These were identified through public scoping and are intended to maintain or increase

GRSG abundance and distribution in the planning area. While the goal is the same across alternatives, each alternative contains a discrete set of objectives, allowable uses, and management actions, constituting a separate RMPA. The goal is met in varying degrees, with the potential for different long-range outcomes and conditions. Conservation measures in the alternatives focus on PH and GH areas, depending on the alternative’s objective. The PH and GH have been delineated by MFWP in coordination with BLM.

The relative emphasis given to particular resources and resource uses differs as well, including allowable uses, restoration measures, and specific direction pertaining to individual resource programs. When resources or resource uses are mandated by law or are not tied to planning issues, there are typically few or no distinctions between alternatives.

The alternatives are directed toward responding to USFWS-identified issues and threats to GRSG and their habitat. All of the action alternatives use resource programs to address the USFWS-identified threats (USFWS 2013). **Table 2-1**, Management Zone I – Yellowstone Watershed, identifies the threats and the applicable BLM-resource programs in RMPs for addressing the threats to the Yellowstone Watershed population. **Table 2-2**, Management Zone IV – Belt Mountains, identifies the threats and the applicable BLM resource programs in RMPs for addressing the threats to the Belt Mountain GRSG population.

Select differences among the four alternatives are described in **Table 2-3**, Comparative Summary of Alternatives. **Table 2-4**, Description of Alternatives A, B, C, and D, provides a complete description of proposed decisions for each alternative, including the project goal and objectives, allowable uses, and management actions for individual resource programs. Figures in **Appendix A** provide a visual representation of differences between alternatives. In some instances, varying levels of management overlap a single polygon due to management prescriptions from different resource programs.

**Table 2-1  
Management Zone I – Yellowstone Watershed**

**USFWS-Identified Threats to GRSG and Their Habitat and Applicable BLM RMP Resource Programs for Addressing Threats**

<b>USFWS-Identified Threat to GRSG and Their Habitat (Threats not known to be present or unknown are not listed)</b>	<b>Status<sup>1</sup></b>	<b>Applicable BLM RMP Resource Program for Addressing the Threat</b>
Agriculture Conversion	Y	Program: Lands and Realty Decision: Identify lands for acquisition, retention, and disposal

<sup>1</sup>Threats characterized as: Y = threat is present and widespread, L = threat present but localized

**Table 2-1  
Management Zone I – Yellowstone Watershed**

**USFWS-Identified Threats to GRSG and Their Habitat and Applicable BLM RMP Resource Programs for Addressing Threats**

<b>USFWS-Identified Threat to GRSG and Their Habitat (Threats not known to be present or unknown are not listed)</b>	<b>Status<sup>1</sup></b>	<b>Applicable BLM RMP Resource Program for Addressing the Threat</b>
Weeds/Annual Grasses	Y	Program: Vegetation Decisions: Implement weed control, suppression, or eradication; allowable use restrictions; or active management or treatment
Energy	Y	Program: Fluid Minerals Decisions: This amendment will not make any decisions regarding new fluid mineral leases as described in <b>Chapter I, Section 1.3</b> and <b>Section 1.6.4.</b>
Infrastructure	Y	Program: Lands and Realty – Right-of-Ways (ROW) Decisions: Issue ROW grant; identify ROW avoidance or exclusion areas; issue permits and leases to authorize use of lands (for example, agricultural, occupancy, storage) Program: Range Management – Fences Decision: Install or remove fences Program: Comprehensive Trails and Travel Management (CTTM)– Roads Decisions: Identify travel management areas, modes of access and travel, and areas open, limited, or closed to OHVs
Grazing	Y	Program: Range Management Decisions: Identify acres open and closed to grazing; establish animal unit months (AUMs); manage grazing systems; improve ranges; identify season of use and stocking rates Program: Special Status Species Decision: Identify habitat management
Sagebrush Elimination	L	Program: Vegetation Decision: Conduct vegetation treatments
Fire	L	Program: Wildland Fire Management Decisions: Change fire management strategies; identify areas suitable/unsuitable for wildland fire use and priority areas for suppression Program: Wildland Fire Management Decisions: Establish fire management strategies; identify areas suitable and unsuitable for prescribed fire use Program: Vegetation Decision: Conduct vegetation treatments through prescribed fire

**Table 2-1  
Management Zone I – Yellowstone Watershed**

**USFWS-Identified Threats to GRSG and Their Habitat and Applicable BLM RMP Resource Programs for Addressing Threats**

<b>USFWS-Identified Threat to GRSG and Their Habitat (Threats not known to be present or unknown are not listed)</b>	<b>Status<sup>1</sup></b>	<b>Applicable BLM RMP Resource Program for Addressing the Threat</b>
Conifers	L	Program: Vegetation Decision: Conduct vegetation treatments
Recreation	L	Program: Recreation Decision: Issue special recreation permits (SRP) Program: CTTM – Roads Decisions: Identify travel management areas, modes of access and travel, and areas open, limited, or closed to OHVs

Source: USFWS 2013

**Table 2-2  
Management Zone IV – Belt Mountains**

**USFWS-Identified Threats to GRSG and Their Habitat and Applicable BLM RMP Resource Programs for Addressing Threats**

<b>USFWS-Identified Threat to GRSG and Their Habitat (Threats not known to be present or unknown are not listed)</b>	<b>Status<sup>1</sup></b>	<b>Applicable BLM RMP Resource Program for Addressing the Threat</b>
<sup>1</sup> Threats characterized as: Y = threat is present and widespread, L = threat present but localized		
Isolated/Small Size	Y	Program: Lands and Realty Decision: Identify lands for acquisition, retention, and disposal
Agriculture Conversion	Y	Program: Lands and Realty Decision: Identify lands for acquisition, retention, and disposal
Weeds/Annual Grasses	Y	Program: Vegetation Decisions: Implement weed control, suppression, or eradication; allowable use restrictions; or active management or treatment
Grazing	Y	Program: Range Management Decisions: Identify acres open and closed to grazing; establish AUMs; manage grazing systems; improve ranges; identify season of use and stocking rates Program: Special Status Species Decision: Identify habitat management

**Table 2-2  
Management Zone IV – Belt Mountains**

**USFWS-Identified Threats to GRSG and Their Habitat and Applicable BLM RMP Resource Programs for Addressing Threats**

<b>USFWS-Identified Threat to GRSG and Their Habitat (Threats not known to be present or unknown are not listed)</b>	<b>Status<sup>1</sup></b>	<b>Applicable BLM RMP Resource Program for Addressing the Threat</b>
Sagebrush Elimination	L	Program: Vegetation Decision: Conduct vegetation treatments
Fire	L	Program: Wildland Fire Management Decisions: Change fire management strategies; identify areas suitable/unsuitable for wildland fire use and priority areas for suppression
		Program: Wildland Fire Management Decisions: Establish fire management strategies; identify areas suitable and unsuitable for prescribed fire use
		Program: Vegetation Decision: Conduct vegetation treatments through prescribed fire
Energy	Y	Program: Fluid Minerals Decisions: This amendment will not make any decisions regarding new fluid mineral leases as described in <b>Chapter I, Sections I.3 and I.6.4.</b>
Infrastructure	Y	Program: Lands and Realty – ROWs Decisions: Issue ROW grant; identify ROW avoidance or exclusion areas; issue permits and leases to authorize use of lands (for example, agricultural, occupancy, storage)
		Program: Range Management – Fences Decision: Install or remove fences
		Program: CTTM – Roads Decisions: Identify travel management areas, modes of access and travel, and areas open, limited, or closed to OHVs
Conifers	L	Program: Vegetation Decision: Conduct vegetation treatments
Recreation	L	Program: Recreation Decision: Issue SRPs
		Program: CTTM – Roads Decisions: Identify travel management areas, modes of access and travel, and areas open, limited, or closed to OHVs
Urbanization	L	Program: Lands and Realty Decision: Identify retention and disposal areas

Source: USFWS 2013

### 2.4.1 Management Common to All Alternatives

Allowable uses and management actions from the existing RMPs that remain valid and do not require revision have been carried forward to all of the proposed alternatives. Other decisions are common only to the action alternatives.

Although each alternative emphasizes a slightly different mix of resources and resource uses, all four alternatives contain the following common elements:

- Comply with state and federal laws, regulations, policies, and standards, including FLPMA multiple use mandates.
- Implement actions originating from laws, regulations, and policies and conform to day-to-day management, monitoring, and administrative functions not specifically addressed.
- Honor valid existing rights, which include any leases, claims, or other use authorizations established before a new or modified authorization, change in land designation, or new or modified regulation is approved.
- Existing fluid mineral leases are managed through conditions of approval (COAs). The BLM has the discretion to modify surface operations to change or add specific mitigation measures when supported by environmental analysis. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into conditions of approval of the permit, plan of development, and/or other use authorizations. Those types of decisions are outside the scope of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.
- Collaborate with adjacent landowners, federal and state agencies, tribes, communities, other agencies, and other individuals and organizations, as needed, to monitor and implement decisions to achieve desired resource conditions.
- Protect people and property from wildfire.

In addition to the shared elements above, allowable uses and management actions common to all four alternatives are listed in **Table 2-4**. These uses and actions are indicated by a single cell across the table row.

### 2.4.2 Alternative A (No Action)

Alternative A meets the CEQ requirement that a no action alternative be considered. This alternative continues current management direction and prevailing conditions derived from existing planning documents. Goals and objectives for resources and resource uses are based on the Judith Resource Area Resource Management Plan and the Headwaters Resource Management

Plan/Environmental Impact Statement Record of Decision, along with associated amendments, activity and implementation level plans, and other management decision documents. Laws and regulations that supersede RMP decisions would apply.

No PH or GH would be delineated under Alternative A. Goals and objectives for BLM-administered lands and mineral estate would not change. Appropriate and allowable uses and restrictions pertaining to such activities as mineral leasing and development, recreation, construction of utility infrastructure, and livestock grazing would also remain the same. The BLM would not modify existing criteria or establish additional criteria to identify site-specific use levels.

### **2.4.3 Elements Common to Alternatives B, C, and D**

Alternatives B, C, and D include two basic components: delineated PH and GH and RDFs.

#### *Delineate Lands as Priority and General Habitat*

Under Alternatives B, C, and D, PPH and PGH data would be refined to (1) delineate PH and analyze actions within PH to conserve GRSG habitat functionality, or where possible, improve habitat functionality; and (2) delineate GH and analyze actions within GH that provide for major life history function (e.g., breeding, migration, or winter survival). The purpose of this would be to maintain genetic diversity needed for sustainable GRSG populations. The areas delineated as PH and GH would be the same under each alternative; however, the allowable uses and management actions within PH and GH may vary between alternatives to meet the goal of the RMPA and objectives of the alternative.

#### *Required Design Features*

RDFs are means, measures, or practices intended to reduce or avoid adverse environmental impacts. This RMPA/EIS proposes a suite of design features that would establish the minimum specifications for certain activities, such as water developments, certain mineral development, and fire and fuels management, to mitigate adverse impacts. These RDFs would provide a greater level of regulatory certainty than through implementing BMPs.

In general, the RDFs are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed except at the project-specific level, when the project location and design are known. Because of site-specific circumstances, some features may not apply to some projects (e.g., a resource is not present on a given site) or may require slight variations from what is described in the RMPA/EIS (e.g., a larger or smaller protective area). All variations in RDFs would require appropriate analysis and disclosure as part of future project authorizations. Additional mitigation measures may be identified and required during individual project development and environmental review. The proposed RDFs are presented in **Appendix C**, Required Design Features

and Best Management Practices for Greater Sage-Grouse Habitat for Alternatives B and C, and **Appendix D**, Required Design Features and Best Management Practices for Greater Sage-Grouse Habitat for Alternative D.

#### **2.4.4 Alternative B**

GRSG conservation measures in *A Report on National Greater Sage-Grouse Conservation Measures* (NTT 2011) to form BLM management direction under Alternative B. Management actions by the BLM, in concert with other state and federal agencies and private landowners, play a critical role in the future trends of GRSG populations. To ensure BLM management actions are effective and based on the best available science, the National Policy Team created a National Technical Team in August 2011. The BLM's objective for chartering this planning strategy was to develop new or revised regulatory mechanisms, through RMPs, to conserve and restore the GRSG and its habitat on BLM-administered lands. Conservation measures under Alternative B are focused on PH (areas that have the highest conservation value to maintaining or increasing GRSG populations).

**Table 2-3**, summarizes select proposed decisions, and **Table 2-4**, includes details of all proposed decisions. **Appendix C** provides RDFs and BMPs for surface-disturbing activities. Key components of Alternative B are discussed below.

**Travel and transportation management**—Alternative B would limit motorized travel to existing roads, primitive roads, and trails at a minimum until travel management planning is complete and routes are either designated or closed. Under Alternative B, route construction in PH would be limited to realignments of existing designated routes, except to access valid existing rights; this would require additional mitigation for disturbances greater than three percent for that area. Alternative B would emphasize restoration of nondesignated roads, primitive roads, and trails in PH.

**Lands and realty**—PH would be designated as ROW exclusion area for new land use authorizations (approximately 233,219 acres), and GH would be designated as ROW avoidance areas for new land use authorizations (approximately 112,341 acres). Lands within PH would be recommended for mineral withdrawal proposals, and other withdrawal proposals in PH would need to be consistent with GRSG conservation measures.

**Range management**—Grazing would be allowed on all lands identified as suitable (approximately 337,165 acres). Alternative B would consider retiring permitted grazing use on allotments in PH when the current permittee is willing. Within PH, GRSG habitat objectives and management considerations would be incorporated into all BLM grazing allotments through AMPs or permit renewals. The BLM would prioritize completion of land health assessments in PH and implement actions to modify grazing management to meet GRSG habitat requirements. Alternative B would focus forage treatments and restrictions to range improvements in PH.

**Energy and mineral development**—Existing leases in PH would be subject to conservation measures through RMP implementation decisions and on completion of the environmental record of review. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into COAs of the permit, plan of development, and/or other use authorizations.

Surface coal mining would be considered unsuitable (approximately 385,693 acres), and no subsurface coal mining disturbances and facilities would be allowed in PH. All PH (approximately 279,097 acres) would be closed to salable minerals and nonenergy leasable minerals, and would be recommended for withdrawal for locatable minerals.

**Fire and fuels management**—In PH, the BLM would design and implement fuels treatments and suppression, with an emphasis on protecting sagebrush ecosystems. Sagebrush canopy cover would not be reduced less than 15 percent, unless a fuels management objective were to require additional reduction in sagebrush cover to meet strategic protection of PH and conserve habitat quality for the species. Under Alternative B, fuels management projects in PH would be designed to reduce wildfire threats in the greatest area.

**Habitat restoration/vegetation management**—The BLM would prioritize implementing restoration projects. Decisions would be based on environmental variables that would improve chances for project success in areas most likely to benefit GRSG. The BLM would make meeting habitat restoration objectives within PH areas the highest restoration priority.

**Special designations**—GRSG habitat would not be designated as an ACEC. GRSG PH and GH areas would be protected and managed consistent with the identified management actions and constraints in this alternative.

#### 2.4.5 **Alternative C**

During scoping for the National Greater Sage-Grouse Planning Strategy, individuals and conservation groups submitted management direction recommendations for protecting and conserving GRSG and habitat at the range-wide level. The recommendations, in conjunction with resource allocation opportunities and internal subregional BLM input, were reviewed in order to develop BLM management direction for GRSG under Alternative C. Conservation measures under Alternative C are focused on both PH and GH (seasonal or year-round habitat outside of PH).

**Table 2-3** summarizes select proposed decisions, and **Table 2-4** includes details of all proposed decisions. **Appendix C** provides RDFs and BMPs for surface-disturbing activities. Key components of Alternative C are discussed below.

**Travel and transportation management**—Similar to Alternative B, Alternative C would limit motorized travel in PH to existing roads, primitive roads, and trails, at a minimum. Alternative C would have the most restrictive requirements for constructing routes to existing valid rights, requiring a four-mile buffer from leks. Under Alternative C, route construction in PH and GH would be limited to realignments of existing designated routes. Like Alternative B, this alternative would also emphasize restoration of nondesignated roads, primitive roads, and trails in PH. Alternative C would have the most restrictions on travel and transportation.

**Lands and realty**—PH and GH would be designated as ROW exclusion areas (approximately 345,560 acres). Lands within PH would be recommended for mineral withdrawal proposals, and other withdrawal proposals in PH and GH would need to be consistent with effective GRSG conservation measures. Alternative C would have the most restrictions on ROW development and withdrawals.

**Range management**—Alternative C would remove livestock grazing from all allotments in PH and GH.

**Energy and mineral development**—Existing leases in PH and GH habitat would be subject to conservation measures as COAs at the project and well permitting stages, and through RMP implementation decisions on completion of the environmental record of review. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document and incorporated, as appropriate, into COAs of the permit, plan of development, and/or other use authorizations.

Management of coal, salable minerals, nonenergy leasable minerals, and locatable minerals would be similar to that under Alternative B. Alternative C would have the most restrictions on energy and mineral development.

**Fire and fuels management**—This is similar to management under Alternative B; however, all management would apply to both PH and GH.

**Habitat restoration/vegetation management**—The BLM would prioritize implementing restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit GRSG. The BLM would make meeting habitat restoration objectives within PH and GH the highest restoration priority.

**Special designations**—All PH areas for GRSG with at least 4,000 acres of contiguous BLM surface ownership would be designated as an ACEC to protect GRSG habitat (96,246 acres; see **Appendix E**, Area of Critical Environmental Concern Evaluation of Relevance and Importance Criteria). Management actions for the ACEC would be consistent with the management actions/constraints identified in Alternative C to protect GRSG habitat.

#### 2.4.6 Alternative D (Agency Preferred)

Alternative D, the agency-preferred alternative, seeks to allocate limited resources among competing human interests, land uses, and the conservation of natural resource values. At the same time, it would sustain and enhance ecological integrity across the landscape, including plant, and wildlife habitat. This alternative incorporates local adjustments to *A Report on National Greater Sage-Grouse Conservation Measures* (NTT 2011) and habitat boundaries to provide a balanced level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses. Conservation measures under Alternative D are focused on both PH and GH.

**Table 2-3** summarizes select proposed decisions, and **Table 2-4** includes details of all proposed decisions. **Appendix D** provides RDFs and BMPs for surface-disturbing activities. Key components of Alternative D are discussed below.

**Travel and transportation management**—Similar to Alternative A, Alternative D would limit motorized travel in the planning area to existing roads, primitive roads, and trails. Similar to Alternative B, route construction in PH would be limited to realignments of existing designated routes. However, construction of access roads to existing rights would be less restrictive and would be evaluated on a case-by-case basis. Similar to Alternative B, Alternative D would emphasize restoration of nondesignated roads, primitive roads, and trails in PH, following completion of travel management plans.

**Lands and realty**—PH would be designated as ROW avoidance areas (approximately 233,219 acres; wind energy authorizations would be avoided from PH and GH areas). GH would be open to non-wind ROW development and evaluated on a case-by-case basis. Similar to Alternative B, nonmineral withdrawal proposal in PH would need to be consistent with GRSG conservation measures.

**Range management**—Similar to Alternative B, grazing would be allowed on all lands identified as suitable (approximately 337,165 acres). Within PH, GRSG habitat objectives and management considerations would be incorporated into all BLM grazing allotments through watershed planning and permit renewal process. Similar to Alternative B, the BLM would prioritize completion of land health assessments in PH. Like Alternative B, Alternative D would focus forage treatments and restrictions on range improvements in PH.

In PH, land health evaluations and determinations would be conducted that include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. State objectives would be used for fine-scale analysis, unless local objectives are developed at the field office level, in partnership with MFWP and USFWS. The objectives would be used during the land health evaluation and determination process and specifically linked to LFO Standard #5, the

biodiversity standard (see **Appendix F**, Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management for Montana and the Dakotas). Future management actions would be developed if land health determinations indicate that an allotment is not meeting standards (that have incorporated the GRSG habitat objectives) due to current livestock grazing.

**Energy and mineral development**—Existing leases in the planning area would be subject to conservation measures through implementation decisions and on completion of the environmental record of review. Operating constraints would also be applied to existing leases as COAs. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into COAs of the permit, plan of development, and/or other use authorizations.

The planning area would be available for coal exploration, subject to environmental review and mitigation measures. On a case-by-case basis, unsuitability criteria for coal would be applied and a plan amendment would be prepared. Proposed locatable minerals actions would be analyzed in Plan of Operations and appropriate mitigation would be applied. Permits for nonenergy leasable minerals and salable minerals would be considered on a case-by-case basis, and appropriate mitigation measures would be required.

**Fire and fuels management**—In suitable GRSG habitat, the BLM would design and implement fuels treatment and suppression with an emphasis on protecting sagebrush ecosystems. Sagebrush canopy would not be reduced to less than 15 percent, unless a fuels management objective were to require additional reduction in sagebrush cover to meet strategic protection of PH and conserve habitat quality for the species. Similar to Alternative B, fuels management projects in PH would be designed to reduce wildfire threats in the greatest area.

**Habitat restoration/vegetation management**— The BLM would make meeting GRSG habitat restoration objectives in PH and GH a high priority, while also considering other species.

**Special designations**—GRSG habitat would not be designated as an ACEC. It would be protected and managed consistent with the identified management actions and constraints under this alternative.

## 2.5 REGIONAL MITIGATION STRATEGY

Mitigation strategies, which take into account the mitigation hierarchy (avoid, minimize, restore, offset), are an important tool for ensuring the BLM meets their GRSG resource objectives while continuing to honor our multiple-use mission. The BLM priority is to mitigate impacts to an acceptable level onsite, to the extent practical, through avoidance (not taking a certain action or parts of an action), minimization (limiting the degree or magnitude of the action and its

implementation), rectification (repairing, rehabilitating, or restoring the affected environment), or reduction of impacts over time (preservation and maintenance operations during the life of the action). While mitigating impacts for proposed projects to an acceptable level onsite is typically analyzed and determined through site-specific, implementation-level NEPA documents and their commensurate decision documents, the analysis and mitigation for project level activities would be tiered to the analysis and mitigation proposed throughout each of the action alternatives in this RMPA. **Appendix G**, Regional Mitigation Strategy, provides the approach to the regional mitigation strategy.

## 2.6 MONITORING FOR THE GREATER SAGE-GROUSE PLANNING STRATEGY

The BLM's planning regulations, specifically 43 CFR 1610.4-9, require that land use plans establish intervals and standards for monitoring based on the sensitivity of the resource decisions. Land use plan monitoring is the process of tracking the implementation of land use plan decisions (implementation monitoring) and collecting the data/information necessary to evaluate the effectiveness of land use plan decisions (effectiveness monitoring). These types of monitoring are also described in the criteria found in the USFWS's Policy for Evaluation of Conservation Efforts When Making Listing Decisions (50 CFR Volume 68, No. 60). One of the Policy for Evaluation of Conservation Efforts When Making Listing Decisions criteria evaluates whether provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.

A guiding principle in the BLM National Sage-grouse Conservation Strategy (DOI 2004) is that "the Bureau is committed to sage-grouse and sagebrush conservation and will continue to adjust and adapt our National Sage-grouse Strategy as new information, science, and monitoring results evaluate effectiveness over time." In keeping with the WAFWA Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and the Greater Sage-grouse Conservation Objectives: Final Report (USFWS 2013), the BLM would monitor implementation and effectiveness of conservation measures in Alternatives B, C, and D in GRSG habitats.

On March 5, 2010, USFWS' *12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered* were posted as a Federal Register notice (75 *Federal Register* 13910-14014, March 23, 2010). This notice stated:

...the information collected by BLM could not be used to make broad generalizations about the status of rangelands and management actions. There was a lack of consistency across the range in how questions were interpreted and answered for the data call, which limited our ability to use the results to understand habitat conditions for sage-grouse on BLM lands.

Standardization of monitoring methods and implementation of a defensible monitoring approach (within and across jurisdictions) would help resolve this situation. The BLM and other conservation partners use the resulting information to guide implementation of conservation activities.

Monitoring strategies for GRSG habitat and populations must be collaborative, as habitat occurs across jurisdictional boundaries (52 percent on BLM-administered lands, 31 percent on private lands, eight percent on National Forest System lands, five percent on state lands, four percent on tribal and other federal lands; 75 *Federal Register* 13910, March 23, 2010), and state fish and wildlife agencies have primary responsibility for population level wildlife management, including population monitoring. Therefore, population efforts would continue to be conducted in partnership with state fish and wildlife agencies. The monitoring framework includes methods, data standards, and intervals of monitoring at broad- and mid-scales; consistent indicators to measure and metric descriptions for each of the scales (see Habitat Assessment Framework and Assessment, Inventory, and Monitoring core indicators); analysis and reporting methods; and the incorporation of monitoring results into adaptive management. The need for fine-scale and site-specific habitat monitoring may vary by area depending on existing conditions, habitat variability, threats, and land health. Indicators at the fine- and site-scales would be consistent with the Habitat Assessment Framework; however, the values for the indicators could be adjusted for regional conditions. The major components of the monitoring framework are in **Appendix B**.

More specifically, the framework discusses how the BLM would monitor and track implementation and effectiveness of planning decisions (e.g., tracking of waivers, modifications, and site-level actions). The BLM would monitor the effectiveness of RMP decisions in meeting management and conservation objectives. Effectiveness monitoring would include monitoring disturbance in habitats, as well as landscape habitat attributes. To monitor habitats, the BLM would measure and track attributes of PH and GH at the broad-scale, and attributes of habitat availability, patch size, connectivity, linkage/connectivity habitat, edge effect, and anthropogenic disturbances at the mid-scale. Disturbance monitoring would measure and track changes in the amount of sagebrush in the landscape and changes in the anthropogenic footprint, including change energy development density. The framework also includes methodology for analysis and reporting for field offices, states, and BLM districts, including geospatial and tabular data for disturbance mapping (e.g., geospatial footprint of new permitted disturbances) and management actions effectiveness.

The monitoring data would provide the indicator estimates for adaptive management. The BLM would adjust management decisions through an adaptive management process.

## 2.7 ADAPTIVE MANAGEMENT

Adaptive management is a decision process that promotes flexible resource management decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps with adjusting resource management directions as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. On February 1, 2008, the DOI published its Adaptive Management Implementation Policy (522 DM 1). The adaptive management strategy presented within this EIS complies with this policy.

In relation to the BLM's National Greater Sage-grouse Planning Strategy, adaptive management will help identify if GRSG conservation measures presented in Alternatives B, C, and D in this EIS contain the needed level of certainty for effectiveness. If principles of adaptive management are incorporated into the conservation measures in the plan (to ameliorate threats to a species), then there is a greater likelihood that a conservation measure or plan will be effective in reducing threats to that species. The following provides the BLM adaptive management strategy for this RMPA.

### 2.7.1 Adaptive Management and Monitoring

This Draft EIS contains a monitoring framework plan (**Appendix B**) which includes an effectiveness monitoring component. The agencies intend to use the data collected from the effectiveness monitoring to identify any changes in habitat conditions related to the goals and objectives of the plan and other range-wide conservation strategies (DOI 2004; Stiver et al. 2006; USFWS 2013). When available from WAFWA and/or state wildlife agencies, information about population trends will be considered with effectiveness monitoring data (taking into consideration the lag effect response of populations to habitat changes [Garton et al. 2011]). The information collected through the Monitoring Framework Plan outlined in **Appendix B** will be used by the BLM to determine when adaptive management hard and soft triggers (discussed below) are met.

### 2.7.2 Adaptive Management Plan

The BLM will develop an adaptive management plan to provide certainty that unintended negative impacts on GRSG will be addressed before consequences become severe or irreversible and to provide regulatory certainty to the USFWS that appropriate action will be taken by the BLM. This adaptive management plan will:

- identify science based soft and hard adaptive management triggers applicable to each population or subpopulation within the planning area,
- address how the multiple-scale data from the Monitoring Framework Plan (**Appendix B**) will be used to gauge when adaptive management triggers are met, and
- charter an adaptive management working group to assist with responding to soft adaptive management triggers.

### ***Adaptive Management Triggers***

Adaptive management triggers are essential for identifying when potential management changes are needed in order to continue meeting GRSG conservation objectives. The BLM will use a continuum of trigger points (soft and hard triggers), which will enhance BLM's ability to effectively manage GRSG habitat. The soft and hard triggers that will be delineated in the adaptive management plan will (at a minimum):

- be based upon the best available science,
- tied to the populations/demographics,
- take into account the importance of various seasonal habitat types, and
- not be limited to a single time "window".

Soft triggers indicate when the BLM will consider adjustments to resource/resource use management. An adaptive management working group will help identify the causal factors as to what prompted the soft adaptive management trigger. The group will also provide recommendations to the appropriate BLM authorizing official (decision maker) regarding the applicable management response to address this trigger (e.g., effective mitigation, restoration, reclamation, and in some instances, a land use plan amendment or revision). When organizing the adaptive management working group, the BLM will invite participation from BLM, USFWS, local governments, cooperating agencies, and MFWP.

Hard triggers indicate when the BLM will take immediate action to stop the continued deviation from conservation objectives. These actions could include one or more of the following (which may require subsequent NEPA):

- Temporary closures (as directed under BLM IM No. 2013-035),
- Immediate implementation of interim management policies and procedures through the BLM directives system, and
- Initiation of a new RMP amendment to consider changes to the existing RMP decisions.

## **2.8 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS**

The following alternatives were considered but were not carried forward for detailed analysis because (1) they would not fulfill requirements of FLPMA or other existing laws or regulations, (2) they did not meet the purpose and need, (3) they were already part of an existing plan, policy, or administrative function, or (4) they did not fall within the limits of the planning criteria. FLPMA requires the BLM to manage BLM-administered lands and resources in accordance with the principles of multiple use and sustained yield. This includes recognizing the nation's needs for domestic sources of minerals, food, timber, and fiber. Moreover, the BLM is required by law to recognize existing valid rights on BLM-administered lands and to manage BLM-administered lands in accordance with existing laws. These include the General Mining Law of 1872 and the Mining and Minerals Policy Act of 1970.

### **2.8.1 National Technical Team Conservation Measures Not Applicable to Lewistown Field Office**

No management actions from *A Report on National Greater Sage-Grouse Conservation Measures* (NTT 2011) concerning wild horse and burros were carried forward. This is because there are no wild horse or burro herds managed by the LFO.

### **2.8.2 Elimination of Livestock Grazing from BLM Lands**

An alternative that proposes to make the entire planning area unavailable for livestock grazing would not meet the purpose and need of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS. NEPA requires that agencies study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. No issues or conflicts have been identified during this land use planning effort that require the complete elimination of livestock grazing within the planning area for their resolution (BLM Washington Office IM 2012-169) (BLM 2012c). Livestock removal and use adjustment where appropriate have been incorporated in this planning effort. Because the BLM has considerable discretion through its grazing regulations to determine and adjust stocking levels, seasons-of-use, and grazing management activities, and to allocate forage to uses of the BLM-administered lands in RMPs, the analysis of an alternative to entirely eliminate grazing is not needed.

In accordance with the BLM's H-1601-1 Land Use Planning Handbook and BLM Washington Office IM No. 2012-169, the BLM considered a range of alternatives with respect to both areas that were available or unavailable for livestock grazing and the amount of forage allocated to livestock on a planning area-wide basis. An alternative eliminating livestock grazing in all allotments in PH and GH was developed. On allotments outside of PH and GH, no multiple-use conflicts or issues were identified that would affect GRS habitat conditions or management. The range of alternatives considered includes a meaningful

reduction in livestock grazing, both through a reduction in areas available to livestock grazing and forage allocation.

The majority of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area is located in the northwestern portion of the Great Plains Ecoregion (EPA 2010a) and the rangelands in the planning area are classified as mixed-grass prairie. The rangelands of the Great Plains have a long evolutionary history of grazing and grazing is accepted by grassland ecologists as a keystone process of the grassland ecosystem (Fuhlendorf and Engle 2001; Milchunas, et al. 1988; Knapp et al. 1999). There is also agreement among many scientists and natural resource managers that some level of grazing disturbance is necessary to assure the ecological integrity of the mixed-grass prairie ecosystem (Parks Canada 2002).

Current resource conditions on BLM-administered land, including range vegetation, watershed, and wildlife habitat, as reflected in land health assessments, do not warrant prohibition of livestock grazing throughout the entire planning area. Following initial surveyed forage allocations, land health evaluations, inventories, and monitoring data (vegetative and levels of use) have been the basis for increasing or decreasing permitted use. Through this process, the planning area has changed the grazing allocations on allotments to ensure that the healthy ecological systems are provided for future generations.

## **2.9 CONSIDERATIONS FOR SELECTING A PREFERRED ALTERNATIVE**

The proposed alternatives offer a range of discrete strategies for the following:

- Resolving deficiencies in existing management
- Exploring opportunities for enhanced management
- Addressing issues identified through internal assessment and public scoping related to maintaining or increasing GRSg abundance and distribution on BLM-administered lands

Comments submitted by other government agencies, public organizations, state and tribal entities, and interested individuals were given careful consideration. Public scoping enabled the BLM to identify and shape important issues pertaining to GRSg habitat, energy development, livestock grazing, West Nile virus, potential ACECs, BLM-administered land access, and other program areas. Cooperating agencies reviewed and provided comments at critical intervals during the alternatives development process.

NEPA regulations developed by the CEQ require the BLM to identify a preferred alternative in the RMPA/EIS. Formulated by the planning team, the preferred alternative represents those goals, objectives, and actions determined to be most effective at resolving planning issues and balancing resource use at this stage of the process. While collaboration is critical in developing and

evaluating alternatives, the final designation of a preferred alternative remains the exclusive responsibility of the BLM.

The identification of a preferred alternative does not constitute a commitment or decision in principle, and there is no requirement to select the preferred alternative or any of the separate individual alternatives as they are presented in the Draft EIS within the ROD. The BLM has the discretion to select any of the alternatives as the agency's preferred alternative and can modify the preferred alternative between the Draft EIS and the Final EIS, as long as the actions presented in the proposed alternative within the Proposed RMPA/Final EIS are analyzed somewhere within the spectrum of alternatives analyzed in the EIS.

### **2.9.1 Recommendations and Resulting Actions**

The Alternative D (Agency-Preferred Alternative) indicates the agency's preliminary preference. The Preferred Alternative does not represent a final BLM decision and may change between publication of the Draft and Final RMPA/EIS based on comments received on the Draft RMPA/EIS, new information, or change in BLM policies or priorities. The BLM selected the Preferred Alternative based on the following criteria:

1. Satisfy statutory requirements
2. Reflect the best combination of decisions to achieve the BLM goals and policies
3. Represent the best solution to the purpose and need
4. Provide the best approach to addressing key planning issues
5. Consider cooperating agencies and BLM specialists' recommendations

## **2.10 SUMMARY COMPARISON OF ALTERNATIVES**

This section summarizes and compares Alternatives A through D considered in the EIS. Combined with the appendices and maps; **Table 2-3** provides the differences among the alternatives, relative to what they establish and where they occur. The table represents a summary of differences with the most potential to affect resources among the alternatives.

Decisions made by this RMPA/EIS are anticipated to be subsequently implemented. Restrictions on resource uses (e.g., ROW exclusion area) made through this RMPA apply for the life of the RMP being amended. Actions taken or authorized by the BLM during RMP implementation would comply with RDFs and BMPs (**Appendix C** for Alternatives B and C, and **Appendix D** for Alternative D), as appropriate.

**Table 2-3  
Comparative Summary of Alternatives**

<b>Resources/Resource Uses</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
Planning Area – BLM Surface (no PH or GH delineation) (acres)	248,435	248,435	248,435	248,435
<b>GRSG Habitat Areas (acres)</b>				
PH – All ownerships	0	1,207,994	1,207,994	1,207,994
PH – BLM	0	233,219	233,219	233,219
GH – All ownerships	0	1,015,035	1,015,035	1,015,035
GH – BLM	0	112,341	112,341	112,341
<b>Livestock Grazing</b>				
Open for all classes of livestock grazing (acres)	570,112	337,165	0	337,165
<i>Open for all classes of livestock grazing in PH</i>	n/a	230,716	0	230,716
<i>Open for all classes of livestock grazing in GH</i>	n/a	106,449	0	106,449
<i>Open for all classes of livestock grazing in non-habitat</i>	248,435	248,435	248,435	248,435
Closed to livestock grazing (acres)	6,781	0	337,165	0
<i>Closed for all classes of livestock grazing in PH</i>	n/a	0	230,716	0
<i>Closed for all classes of livestock grazing in GH</i>	n/a	0	106,449	0
Available AUMs	103,806	69,408	0	69,408
<i>Available AUMs in PH</i>	n/a	49,948	0	49,948
<i>Available AUMs in GH</i>	n/a	19,460	0	19,460
<i>Available AUMs in non-habitat</i>	34,398	34,398	34,398	34,398
<b>Comprehensive Travel and Transportation Management</b>				
Limited to existing routes for motorized and mechanized travel (acres)	345,560	345,560	345,560	345,560
<b>Lands and Realty (acres)</b>				
Right-of-way (ROW) exclusion areas	0	233,219	345,560	0
<i>ROW exclusion areas in PH</i>	n/a	233,219	233,219	0
<i>ROW exclusion areas in GH</i>	n/a	0	112,341	0

**Table 2-3  
Comparative Summary of Alternatives**

<b>Resources/Resource Uses</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
ROW avoidance areas	9,708	112,341	0	240,464
<i>ROW avoidance areas in PH</i>	n/a	0	0	233,219
<i>ROW avoidance areas in GH</i>	n/a	112,341	0	7,245
Recommended for withdrawal	0	233,219	345,560	0
<b>Coal<sup>1</sup></b>				
<b>Unsuitable for surface mining (acres)</b>	0	385,693	639,927	0
<i>Unsuitable in PH</i>	n/a	385,693	385,693	0
<i>Unsuitable in GH</i>	n/a	0	254,234	0
<b>Fluid Mineral Leasing</b>				
<b>Existing fluid mineral leases (acres)</b>				
BLM surface/federal minerals	55,880	55,880	55,880	55,880
Private, state, or other surface/federal minerals	33,881	33,881	33,881	33,881
<b>Locatable Minerals, Salables and Non-Energy Solid Leasable Minerals</b>				
<b>BLM Surface/Federal Minerals (acres)</b>				
Withdrawn from Locatable Mineral Entry	2,538	2,538	2,538	2,538
<i>Withdrawn from Locatable Mineral Entry in PH</i>	n/a	101	101	101
<i>Withdrawn from Locatable Mineral Entry in GH</i>	n/a	2,437	2,437	2,437
Recommend for withdrawal from locatable mineral entry	0	233,219	345,560	0
<i>Recommend for withdrawal from locatable mineral entry in PH</i>		233,219	233,219	0
<i>Recommend for withdrawal from locatable mineral entry in GH</i>		0	112,341	0

<sup>1</sup> Coal development is not addressed in the Judith Resource Area Resource Management Plan Record of Decision (BLM 1994) because: there has been no federal coal mining in the last 70 years, there are no existing federal coal leases in the planning area, and no expression of interest for leasing or exchange have been identified; therefore, no acreage calculations will be created for the amendment.

**Table 2-3  
Comparative Summary of Alternatives**

<b>Resources/Resource Uses</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
Closed to nonenergy leasable mineral exploration or development and saleable mineral disposal	0	233,219	345,560	0
<i>Closed to nonenergy leasable mineral exploration or development and saleable mineral disposal in PH</i>		233,219	233,219	0
<i>Closed to nonenergy leasable mineral exploration or development and saleable mineral disposal in GH</i>		0	112,341	0
<b>Private, State, or Other Surface/Federal Minerals</b>				
Withdrawn from Locatable Mineral Entry (acres)	0	0	0	0
<i>Withdrawn from Locatable Mineral Entry in PH</i>		0	0	0
<i>Withdrawn from Locatable Mineral Entry in GH</i>		0	0	0
Recommend for withdrawal from locatable mineral entry (acres)	0	45,879	108,410	0
<i>Recommend for withdrawal from locatable mineral entry in PH</i>		45,879	45,879	0
<i>Recommend for withdrawal from locatable mineral entry in GH</i>		0	62,531	0
Closed to nonenergy leasable mineral exploration or development and saleable mineral disposal (acres)	0	45,879	108,410	0
<i>Closed to nonenergy leasable mineral exploration or development and saleable mineral disposal in PH</i>		45,879	45,879	0
<i>Closed to nonenergy leasable mineral exploration or development and saleable mineral disposal in GH</i>		0	62,531	0
<b>Areas of Critical Environmental Concern</b>				
ACEC to protect GRSG (acres)	0	0	96,246	0
<i>ACEC to protect GRSG in PH</i>	n/a	0	96,246	0
<i>ACEC to protect GRSG in GH</i>	n/a	0	0	0

### 2.10.1 How to Read Table 2-4

The following describes how **Table 2-4** is written and formatted to show the land use plan decisions proposed for each alternative.

In accordance with Appendix C (as amended) of the BLM *Land Use Planning Handbook* (H-1601-1), land use plan and plan amendment decisions are broad-scale decisions that guide future land management actions and subsequent site-specific implementation decisions (BLM 2005a). Land use plan decisions fall into two categories, which establish the base structure for **Table 2-4**: desired outcomes (goals and objectives) and allowable uses and actions to achieve outcomes.

- Goals are broad statements of desired outcomes that usually are not quantifiable.
- Objectives identify specific desired outcomes for resources. They may be quantifiable and measurable and may have established timeframes for achievement, as appropriate.
- Allowable uses identify uses, or allocations, that are allowable, restricted, or prohibited on BLM-administered lands and mineral estate.
- Actions identify measures or criteria to achieve desired objectives, including actions to maintain, restore, or improve land health.

The alternatives direction/management actions in **Table 2-4** are organized by resource programs identified in the NTT report (*A Report on National Greater Sage-Grouse Conservation Measures*; NTT 2011). In general, only those resources and resource uses that have been identified as planning issues have notable differences between the alternatives in **Table 2-4**. Actions that are applicable to all alternatives are shown in one cell across a row. These particular objectives and actions would be implemented regardless of which alternative is ultimately selected. Actions that are applicable to more than one but not all alternatives are indicated by either combining cells for the same alternatives or by denoting those objectives or actions as the “same as Alternative B,” for example.

Data from geographic information systems (GIS) have been used in developing acreage calculations and for generating many of the figures. Calculations in this EIS are rounded and are dependent upon the quality and availability of data. Data were collected from a variety of sources, including the BLM, collaborative partners, stakeholders, and cooperating agencies. Given the scale of the analysis, the compatibility constraints between datasets, and lack of data for some resources, all calculations are approximate and serve for comparison and analytic purposes only. Likewise, the figures are provided for illustrative purposes and subject to the limitations discussed above. The BLM may receive additional GIS data; therefore, the acreages may be recalculated and revised at a later date.

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**Table 2-4  
Description of Alternatives A, B, C, and D**

<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
<b>GOAL: 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.</b>			
No similar objective.	Objective: <ul style="list-style-type: none"> <li>Protect PH from anthropogenic (human-caused) disturbances that would reduce distribution or abundance of GRSG <ul style="list-style-type: none"> <li>Manage or restore priority areas so that at least 70% of the land cover provides adequate sagebrush habitat to meet GRSG needs</li> <li>Manage PH so that discrete anthropogenic disturbances cover less than 3% of the total GRSG habitat</li> </ul> </li> </ul>	Objective: <ul style="list-style-type: none"> <li>Protect PH and GH from anthropogenic disturbances that would reduce distribution or abundance of GRSG</li> </ul>	Objective: <ul style="list-style-type: none"> <li>Protect PH from anthropogenic disturbances that would reduce distribution or abundance of GRSG</li> </ul>
Habitat Delineation: No similar delineation.	Habitat Delineation: Delineate PH to encompass the 75% breeding bird density map: 233,219 BLM surface acres (19% of total PH acres). See <b>Figure I-1 (Appendix A)</b> .	Habitat Delineation: Same as Alternative B.	Habitat Delineation: Same as Alternative B.
Habitat Delineation: No similar delineation.	Habitat Delineation: Delineate GH to encompass the remainder of the habitat presented in the 100% breeding bird density map: 112,341 BLM surface acres (11% of total GH acres). See <b>Figure I-1 (Appendix A)</b> .	Habitat Delineation: Same as Alternative B.	Habitat Delineation: Same as Alternative B.
<b>ALTERNATIVES DIRECTION</b>			
<b>Travel and Transportation Management</b>			
Action: BLM-administered lands are designated limited yearlong for motorized wheeled vehicles (motorized wheeled cross-country travel is restricted to existing roads and trails) (BLM 2003b).	Action: In PH, limit motorized 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.	Action: Same as Alternative B, except applies to both PH and GH.	Action: Same as Alternative A; in addition, implement a CTTM plan to designate roads and trails (when travel management plan is complete). Administrative off-road use for BLM personnel and BLM authorized activities would be allowed. BLM-implemented CTTM would not apply to private or other state or federal lands within the LFO.
No similar action.	No similar action.	Action: Prohibit new road construction within 4 miles of active GRSG leks, and avoid new road construction in PH and GH.	Action: On completion of site-specific projects, roads used for commercial or administrative access on BLM-administered lands would be reclaimed, unless the route would provide specific benefits for public access, would minimize impacts on the resources, and would be considered on a case-by-case basis.  Action: The BLM may close or restore unauthorized, user created roads and trails to prevent resource damage, including impacts on GRSG.
Action: The BLM would minimize or prevent road and trail development on crucial big game and upland bird habitat areas (BLM 1994).  Action: BLM regulations (43 CFR, Parts 8341.2 and 8364.1) allow for area, road, or trail closures where off-road vehicles are causing or would cause considerable adverse effects on wildlife and its habitat (BLM 2003b).	Action: In PH, travel management should evaluate the need for permanent or seasonal road or area closures.	Action: Same as Alternative B, except applies to both PH and GH.	Action: During route designation and travel planning in PH, travel management would evaluate the need for permanent or seasonal road or area closures where vehicle use is causing or would cause considerable adverse effects on habitat.
Action: Through site-specific planning, the BLM would designate roads and trails for motorized use. Roads and trails would be inventoried, mapped, and analyzed to the degree necessary to evaluate and designate the roads and trails as open, seasonally open, or closed (BLM 2003b).	Action: In PH, complete activity level travel plans within 5 years of the ROD. During activity level planning, and where appropriate, designate routes in PH with current administrative/agency purpose or need for administrative access only.	Action: Same as Alternative B except applies to both PH and GH.	Action: Same as Alternative A.  All CTTM planning should be completed within 5 years of the signing of the ROD for the RMP. The CTTM planning would be conducted using an interdisciplinary team approach to address all resource uses, including administrative, recreation, commercial, and associated modes of travel (motorized, mechanized, and nonmotorized types; BLM – <i>Travel and Transportation Handbook [H-8342]</i> ).

**Table 2-4  
Description of Alternatives A, B, C, and D**

<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
No similar action.	Action: In PH, limit route construction to realignments of existing designated routes if that realignment has a minimal impact on GRSG habitat, if it eliminates the need to construct a new road, or if it is necessary for motorist safety.	Action: In PH and GH, limit route construction to realignments of existing designated routes if that realignment would have a minimal impact on GRSG habitat, if it would eliminate the need to construct a new road, or if it is necessary for motorist safety. Mitigate any impacts with methods that have been demonstrated to be effective to offset the loss of GRSG habitat.	Action: In PH, during site-specific travel and transportation management planning, limit route construction to realignment of existing routes if that realignment has a minimal impact on GRSG habitat, if it eliminates the need to construct a new road, or if it is necessary for motorist safety.
No similar action.	Action: In PH, use existing roads, or realignments, as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road to the absolute minimum standard necessary and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then evaluate and implement additional effective mitigation to offset the resulting loss of GRSG habitat (see Objectives).	Action: Same as Alternative B, using a 4-mile buffer from leks to determine road route.	Action: In PH, during site-specific travel and transportation management planning, use existing roads or realignments, as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road to the absolute minimum standard necessary.
No similar action.	Action: In PH, allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on GRSG habitat, if it is necessary for motorist safety, or if it eliminates the need to construct a new road.	Action: In PH and GH, allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless it is necessary for motorist safety, or eliminates the need to construct a new road. Any impacts shall be mitigated with methods that have been demonstrated to be effective to offset the loss of GRSG habitat.	Action: In PH, during site-specific travel and transportation management planning, the upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity may be allowed when there are minimal impacts on GRSG and GRSG habitat, if it is necessary for motorist safety, or if it eliminates the need to construct a new road. All upgrades to existing routes would be evaluated on a case-by-case basis and would be subject to valid existing rights (e.g., existing ROWs or easements).
No similar action.	Action: In PH, restore roads, primitive roads, and trails not designated in travel management plans. This also includes primitive routes/roads that were not designated in WSAs that have been selected for protection in previous RMPs.	Action: Same as Alternative B, except applies to both PH and GH.	Action: Same as Alternative B, when travel plans are complete (these will not be complete prior to this RMPA decision).
No similar action.	Action: When reseeding roads, primitive roads, and trails in PH, use appropriate seed mixes and consider the use of transplanted sagebrush.	Action: When reseeding closed roads, primitive roads, and trails in PH and GH, use appropriate native seed mixes and require the use of transplanted sagebrush.	Action: Same as Alternative B.
<b>Recreation</b>			
No similar action.	Action: Allow SRPs only in PH that have neutral or beneficial effects on PH.	No similar action.	Action: SRPs in PH may be allowed if they are neutral or beneficial for GRSG habitat.
<b>Lands and Realty</b>			
<b>Rights-of-Way</b>			
<p>Action: ROWs outside of avoidance areas and WSAs would be considered on a case-by-case basis, with appropriate stipulations from BLM Handbook H-2801-1 incorporated into the ROW grant (BLM 1994, page 27).</p> <p>Action: Public land within identified exclusion areas would not be available for utility and transportation corridor development (BLM 1984, page 15).</p> <p>Action: There are no ROW exclusion areas within the Judith Resource Area Resource Management Plan for GRSG. There are two ROW avoidance areas in the decision area (30,193 acres) (Acid Shale Pine Forest ACEC and Judith River Canyon). See <b>Figure 2-1</b>, Rights-of-Way Avoidance Areas - Alternative A (<b>Appendix A</b>).</p>	<p>Action: Make PH exclusion areas for new ROWs (233,219 acres). Consider the following exceptions:</p> <ul style="list-style-type: none"> <li>• Within designated ROW corridors encumbered by existing ROW authorizations: new ROWs may be collocated only if the entire footprint of the proposed project (including construction and staging) can be completed within the existing disturbance associated with the authorized ROWs.</li> <li>• Subject to valid existing rights, where new ROWs associated with valid existing rights are required, collocate new ROWs within existing ROWs or where it best minimizes GRSG impacts. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new</li> </ul>	<p>Action: PH and GH areas shall be exclusion areas for new ROW (345,560 acres). Consider the following exceptions:</p> <ul style="list-style-type: none"> <li>• Within designated ROW corridors encumbered by existing ROW authorizations, new ROWs may be collocated only if the entire footprint of the proposed project (including construction and staging) can be completed within the existing disturbance associated with the authorized ROWs.</li> <li>• Subject to valid existing rights, where new ROWs associated with valid existing rights are required, collocate new ROWs within existing ROWs or where it best minimizes GRSG impacts. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new</li> </ul>	<p>Action: PH would be managed as ROW avoidance areas (233,219 acres).</p> <ul style="list-style-type: none"> <li>• Where new ROWs are required, collocate new ROWs within existing ROWs or where it best minimizes impacts on GRSG and GRSG habitat.</li> </ul> <p>Action: PH and GH would be managed as a wind energy ROW avoidance area (345,560 acres). See <b>Figure 2-4</b>, Rights-of-Way Avoidance Areas - Alternative D (<b>Appendix A</b>).</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	road to the absolute minimum standard necessary and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then evaluate and implement additional effective mitigation on a case-by-case basis to offset the resulting loss of GRSG habitat. See <b>Figure 2-2</b> , Rights-of-Way Avoidance and Exclusion Areas - Alternative B ( <b>Appendix A</b> ).	road to the absolute minimum standard necessary and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then make additional mitigation that has been demonstrated to be effective to offset the resulting loss of GRSG habitat. See <b>Figure 2-3</b> , Rights-of-Way Exclusion Areas - Alternative C ( <b>Appendix A</b> ).	
No similar action.	Action: Make GH avoidance areas for new ROWs (112,341 acres). See <b>Figure 2-2 (Appendix A)</b> .	Action: PH and GH areas should be exclusion areas for new ROW authorizations (345,560 acres). Consider the exceptions listed above. See <b>Figure 2-3 (Appendix A)</b> .	Action: ROWs would be allowed in GH, with appropriate mitigation and conservation measures identified within the terms of the authorization to minimize surface-disturbing and disruptive activities.  Action: GH would be managed as a wind energy ROW avoidance area (112,341 acres). See <b>Figure 2-5</b> , Rights-of-Way Wind Energy Avoidance Areas - Alternative D ( <b>Appendix A</b> ).
No similar action.	Action: In PH, evaluate and take advantage of opportunities to remove, bury, or modify existing power lines within PH.	Action: Same as Alternative B, except applies to both PH and GH.	Action: When addressing ROW authorizations in PH identify and evaluate opportunities to remove, bury, or modify power lines within PH. Financial and technical feasibility would be evaluated during the environmental analysis process.
Action: Current FLMPA ROWs have a stipulation that when the use has been discontinued or abandoned, the site must be reclaimed and restored by the grant holder (43 CFR, Part 2807.19).	Action: In PH, where existing leases or ROWs have had some level of development (such as roads, fences, or wells) and are no longer in use, reclaim the site by removing these features and restoring the habitat.	Action: Same as Alternative B, except applies to both PH and GH.	Action: Current FLPMA ROWs have a stipulation that when the use has been discontinued or abandoned, the site must be reclaimed and restored by the grant holder (43 CFR, Part 2807.19).  Action: As pre-FLPMA nonrenewable authorizations expire, grantees would be required to reclaim sites by removing authorized features and restoring habitat.
Action: Currently have policy to collocate ROWs, when possible.	Action: Where new ROWs are necessary in GH, collocate new ROWs within existing ROWs, where possible.	No similar action.	Action: Same as Alternative B.
No similar action.	No similar action.	Action: ROWs would be amended to require features that enhance GRSG habitat security in PH and GH.  Action: Existing corridors in ACECs may be accessed for maintenance.	No similar action.
Action: Leases/permits (other than cabin site leasing) would be considered on a case-by-case basis (BLM 1994, page 30).	No similar action.	No similar action.	Actions: Leases and permits (other than for cabin site leasing), which may be for agricultural, occupancy, and film production, would be considered on a case-by-case basis; however, PH would be ROW avoidance areas. Leases and permits would be allowed in GH with appropriate mitigation and conservation measures identified within the terms of the authorization to minimize surface-disturbing and disruptive activities.
Action: The holder of a ROW shall be responsible for weed control on disturbed areas within the limits of the ROW. The holder shall be responsible for invasive weed control for the life of the ROW. ROW holder is responsible for weed control and monitoring for 3 years after reclamation has been completed. The holder would be responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods.	No similar action.	No similar action.	Action: Same as Alternative A.
<b>Land Tenure Adjustment</b>			
Action: Land tenure adjustments in Judith Resource Area planning area would be subject to disposal/acquisition criteria identified (BLM 1994).	Action: Retain public ownership of PH. Consider exceptions where: <ul style="list-style-type: none"> <li>• There is mixed ownership, and land exchanges would</li> </ul>	Action: Same as Alternative B, without exceptions for disposal to consolidate ownership that would be beneficial to GRSG (and applies to PH and GH).	Action: PH would be retained in public ownership, except when opportunities for land exchange would provide a greater benefit to GRSG habitat.

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>Action: Land tenure adjustments in the Headwaters planning area would be subject to disposal/acquisition criteria identified (BLM 1984, page 20).</p> <p>Action: Retain important wildlife habitat (one of the three main criteria for land tenure adjustments outlined in the Judith Resource Area Resource Management Plan) (BLM 1994).</p> <p>Action: Headwaters Resource Management Plan land ownership adjustment criteria include nesting/breeding habitat for game animals (BLM 1984, page 20).</p>	<p>allow for additional or more contiguous federal ownership patterns within PH.</p> <ul style="list-style-type: none"> <li>Under PH with minority federal ownership, include an additional, effective mitigation agreement for any disposal of federal land. As a final preservation measure, consideration should be given to pursuing a permanent conservation easement.</li> </ul>		
<p>Action: Land exchanges, sales or other methods of acquisition (BLM 1994).</p> <p>Action: There are no BLM-administered lands identified for disposal by sale within the planning area (BLM 1994, page 30).</p> <p>Action: Sale is the preferred method of disposal when exchange is not feasible (BLM 1984, page 21).</p>	<p>Action: Where suitable conservation actions cannot be achieved in PH, seek to acquire state and private lands with intact subsurface mineral estate by donation, purchase, or exchange in order to best conserve, enhance, or restore GRSG habitat.</p>	<p>Action: The BLM would strive to acquire important private lands in ACECs. Acquisition would be prioritized over easements.</p>	<p>Action: When offered, PH would be a priority in consideration of land acquisitions (refer to <b>Appendix H</b>, Land Pattern Review and Land Adjustment). Consider GRSG for all land tenure actions.</p>
<b>Recommend Land Withdrawals</b>			
<p>Action: There are current withdrawals from minerals on BLM surface (2,862 acres).</p>	<p>Action: Recommend lands within PH for mineral withdrawal (279,097 acres).</p>	<p>Action: Same as Alternative B, except applies to PH and GH (453,969 acres).</p>	<p>Action: Same as Alternative A.</p>
<p>No similar action.</p>	<p>Action: In PH, do not recommend withdrawal proposals 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.)</p>	<p>Action: In PH and GH, do not approve withdrawal proposals 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 that have been demonstrated to be effective.)</p>	<p>Action: Same as Alternative B.</p>
<b>Range Management</b>			
<p>Action: Livestock grazing would continue to be managed through development and monitoring of AMPs or similar grazing plans and supervision of grazing use. AMPs would be developed and maintained to achieve multiple-use objectives, in accordance with the Missouri Breaks Grazing Environmental Impact Statement as modified by the proposed Judith Resource Area Resource Management Plan/Final Environmental Impact Statement. Methods and guidelines from these EISs would be followed to maintain or improve ecological condition, to enhance vegetation production, to maintain and enhance wildlife habitat, to protect watersheds, to reduce bare ground to the target soil vegetation cover by soil subgroups, and to minimize livestock/recreation conflicts. AMPs would implement some form of grazing method (for example, rest rotation, deferred rotation, seasonal, or other methods). Livestock grazing management methods would be implemented prior to land treatments (BLM 1984 and 1994). See <b>Figure 2-6</b>, Grazing</p>	<p>Action: Within PH, incorporate GRSG habitat objectives and management considerations into all BLM grazing allotments through AMPs or permit renewals. See <b>Figure 2-7</b>, Areas Opened and Closed Grazing Allotments Alternatives B and D (<b>Appendix A</b>).</p>	<p>Action: Same as Alternative B, except applies to both PH and GH. See <b>Figure 2-8</b>, Areas Opened and Closed Grazing Allotments Alternative C (<b>Appendix A</b>).</p>	<p>Action: GRSG habitat objectives would be considered when evaluating an allotment's conformance with land health standards prior to renewing a grazing authorization.</p> <p>Action: In PH, conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. <b>Appendix B</b> addresses mid-scale monitoring. State objectives would be used for fine scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS. See <b>Figure 2-7 (Appendix A)</b>.</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>Allotments Alternative A (<b>Appendix A</b>).</p> <p>Action: Livestock grazing would be allowed on all areas not specifically closed to grazing (570,112 acres would be open to grazing and 103,806 AUMS available). See <b>Figure 2-6 (Appendix A)</b>.</p>	<p>Action: Livestock grazing would be allowed on all areas not specifically closed to grazing (570,112 acres would be open to grazing and 103,806 AUMS available). See <b>Figure 2-7 (Appendix A)</b>.</p>	<p>Action: Livestock grazing would be removed on all grazing allotments within PH and GH (337,165 acres and 69,408 AUMs; 232,947 acres would remain open to grazing and there would be 34,398 AUMs available). See <b>Figure 2-8 (Appendix A)</b>.</p>	<p>Action: Same as Alternative B.</p>
<p>No similar action.</p> <p><i>NOTE: This is currently being done on an allotment-specific basis over watershed areas.</i></p>	<p>Action: In PH, cooperate on integrated ranch planning within GRSG habitat so operations with deeded/BLM allotments can be planned as single units.</p>	<p>No similar action.</p>	<p>Action: In PH, cooperate with ranchers and other agencies on integrated ranch planning so operations with intermingled land ownerships within BLM allotments can be planned as single units.</p>
<p>Action: Areas with Category I allotments are the highest priority for processing authorizations, managing uses, and monitoring achievement of land health standards (BLM IM 2009-018, Process for Setting Priorities for Issuing Grazing Permits and Leases).</p>	<p>Action: Prioritize completion of land health assessments and processing grazing permits within PH. Focus this process on allotments that have the best opportunities for conserving, enhancing or restoring habitat for GRSG. Utilize BLM ecological site descriptions to conduct land health assessments to determine if standards of range-land health are being met.</p>	<p>No similar action.</p>	<p>Action: Land health assessments and grazing permit renewals would be completed as they expire within watershed areas. Watershed areas in PH that contain expired or expiring grazing authorizations would be prioritized for renewal.</p> <p>Action: Allotments that have the best opportunities for conserving, enhancing, or restoring habitat for GRSG would receive high priority for monitoring, evaluation, and management.</p> <p>Ecological site descriptions, riparian proper functioning condition (PFC) protocols, water quality data, and various types of appropriate vegetative, riparian, habitat, and any other applicable data would continue to be used as the basis in allotment evaluations to determine conformance to Standards for Land Health and Guidelines for Livestock Grazing Management.</p>
<p>Action: Site-specific ground cover objectives would be incorporated to supplement and support range condition objectives. Ground cover objectives would be consistent with the site potential by soil series or ecological site. Grazing management methods, water developments, land treatments and other practices would be designed to meet ground cover objectives. Monitoring and evaluation methods would be applied and management practices would be modified as needed to ensure these objectives are met (BLM 1994).</p>	<p>Action: In PH, conduct land health assessments that include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. If local/state seasonal habitat objectives are not available, use GRSG habitat recommendations from Connelly et al. (2000) and Hagen et al. (2007).</p>	<p>No similar action.</p>	<p>Action: In PH, conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. <b>Appendix B</b> addresses mid-scale monitoring. State objectives would be used for fine scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS.</p>
<b>Implementing Management Actions after Land Health Evaluations</b>			
<p>Action: Allotments in predominantly fair ecological condition or with fair condition areas due to poor livestock distribution would have grazing methods applied to periodically defer grazing during critical growth periods (BLM 1994).</p>	<p>No similar action.</p>	<p>No similar action.</p>	<p>Action: In PH, conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to livestock grazing. <b>Appendix B</b> addresses mid-scale monitoring. State objectives would be used for fine scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS.</p>
<p>Action: Grazing systems would be implemented. The type of system to be implemented would be based on consideration of the following factors (BLM 1984):</p> <ul style="list-style-type: none"> <li>• Allotment specific management objectives</li> <li>• Resource characteristics, including vegetation potential and water availability</li> </ul>	<p>Action: In the NEPA document prepared for the permit renewal, develop specific objectives to conserve, enhance, or restore PH, based on ecological site descriptions 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</p>	<p>No similar action.</p>	<p>Action: Conserve, enhance, or restore PH based on ecological site descriptions (including wetlands and riparian areas). If an effective grazing system that meets GRSG habitat objectives is not already in place, analyze at least one allotment-specific alternative within the watershed planning/permit renewal process that conserves, restores, or enhances PH.</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
<ul style="list-style-type: none"> <li>Operator needs</li> <li>Implementation costs</li> </ul>	alternative that conserves, restores, or enhances GRSG habitat in the NEPA document prepared for the permit renewal.		
Action: Methods and guidelines from EISs would be followed to maintain or improve ecological condition, to enhance vegetation production, to maintain and enhance wildlife habitat, to protect watersheds, to reduce bare ground to the target soil vegetation cover by soil subgroups, and to minimize livestock/recreation conflicts (BLM 1984 and 1994).	Action: In PH, manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve GRSG seasonal habitat objectives.	Action: In PH and GH, manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve GRSG habitat objectives.	Action: In PH, manage for vegetation composition and structure consistent with ecological site potential within the reference state to achieve GRSG seasonal habitat objectives. Natural ecological processes that impede localized site potential and that create a mosaic of habitat successional patterns would continue to occur.
<p>Action: Livestock use adjustments would be most often made by changing one or more of the following: the kind or class of livestock grazing on an allotment, the season of use, the stocking rate, or the pattern of grazing. Monitoring would be used to measure the changes brought about by new livestock management practices and to evaluate the effectiveness of management changes in meeting stated objectives. Primarily, this would occur on "I" category allotments, which would include priority GRSG habitat (BLM 1984).</p> <p>Action: Allotments in predominantly fair ecological condition or with fair condition areas due to poor livestock distribution would have grazing methods applied to periodically defer grazing during critical growth periods (BLM 1994).</p>	<p>Action: In PH, implement management actions (grazing decisions, AMP/conservation plan development, or other agreements) to modify grazing management to meet seasonal GRSG habitat requirements. Consider singly or in combination changes in the following:</p> <ul style="list-style-type: none"> <li>Season or timing of use</li> <li>Numbers of livestock (includes temporary non-use or livestock removal)</li> <li>Distribution of livestock use</li> <li>Intensity of use</li> <li>Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas, and goats)</li> </ul>	No similar action.	<p>Action: In PH, implement management actions within or outside of the watershed planning/permit renewal process to modify grazing management and to meet seasonal GRSG habitat objectives where allotment evaluations indicate land health assessments are not being met due to current livestock grazing management. Consider singly, or in combination, changes in:</p> <ul style="list-style-type: none"> <li>Season or timing of use</li> <li>Numbers of livestock (includes temporary non-use or livestock removal)</li> <li>Distribution of livestock use</li> <li>Intensity of use</li> <li>Type of livestock</li> </ul>
Action: Efforts to manage public rangeland under drought conditions would be directed first to allotments with resource concerns such as "I" category allotments. Specific allotments in the "M" and "C" categories could also be considered high priority when resource values or conditions so require. Regardless of the category assigned to an allotment, operators should be aware of the procedures and flexibilities available for dealing with drought condition ( <b>Appendix I</b> , Drought Policy).	Action: During droughts, prioritize evaluating effects of the drought in PH relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought, ensure that post-drought management allows for vegetation recovery that meets GRSG needs in PH.	No similar action.	Action: During drought periods, prioritize evaluating effects of the drought in PH, relative to their needs for food and cover. Drought management would continue to be in accordance with the Montana/Dakotas drought policy ( <b>Appendix I</b> ). Since there is a lag in vegetation recovery following drought, post-drought management would be implemented to allow for vegetation recovery that meets GRSG needs in PH. In accordance with BLM grazing regulation 43 CFR, Part 4130.3-3, consultation, cooperation, and coordination with owners or lessees having lands or managing resources within the area, the affected cooperative state grazing district, and interested public would be completed prior to adjusting post-drought livestock management. Implementation of adjustments would be initiated through documented agreement or by decision of the authorized officer.
Action: Allotments in predominantly fair ecological condition or with fair condition areas due to poor livestock distribution would have grazing methods applied to periodically defer grazing during critical growth periods (BLM 1994).	No similar action.	No similar action.	Action: In PH, conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. <b>Appendix B</b> addresses mid-scale monitoring. State objectives would be used for fine scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS.
<b>Riparian Areas and Wet Meadows</b>			
Action: Riparian habitat condition would be improved from unsatisfactory to satisfactory on approximately 26 miles of stream bank (BLM 1994).	Action: Manage riparian areas and wet meadows for PFC within PH. Within PH and GH, manage wet meadows to maintain a component of perennial forbs with diverse species	Action: Manage riparian areas and wet meadows for PFC within PH and GH. Within PH and GH, manage wet meadows to maintain a component of perennial forbs, with diverse	Action: Riparian-wetland areas would be managed for PFC within the LFO. Within PH and GH, manage wet meadows to maintain a component of perennial forbs with diverse species richness relative to

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>Action: The first objective will be to improve or maintain riparian-wetland areas to PFC (BLM 1994).</p> <p>Action: Riparian and wetland areas are in PFC (Lewistown Standard #2, BLM 1997).</p>	<p>richness relative to site potential (e.g., reference state) to facilitate brood rearing. Also conserve or enhance these wet meadow complexes to maintain or increase amount of edge and cover within that edge to minimize elevated mortality during the late brood-rearing period.</p>	<p>species richness and productivity relative to site potential (e.g., reference state), to facilitate brood rearing. At least 6 inches of stubble height must remain on all riparian/meadow area herbaceous species at all times. Also conserve or enhance these wet meadow complexes to maintain or increase the amount of edge and cover within that edge to minimize elevated deaths during the late brood-rearing period.</p>	<p>site potential (e.g., reference state) to facilitate brood rearing. Also conserve or enhance these wet meadow complexes.</p>
<p>Action: The second objective would be to achieve or maintain the desired plant community to provide wildlife habitat, to increase waterfowl habitat by 30%, to improve watershed conditions, and to comply with the nonpoint source water pollution section of the Clean Water Act (BLM 1994).</p>	<p>Action: In PH, where riparian areas and wet meadows meet PFC, strive to attain reference state vegetation relative to the ecological site description.</p> <p>For example, within PH, reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Use fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by GRSG in the summer.</p>	<p>Action: Same as Alternative B, except applies to PH and GH.</p>	<p>Action: Riparian-wetland areas currently achieving PFC would be managed for desired future condition and the desired plant community, based on ecological site potential. Other values to be considered include important wildlife habitat, water quality impaired streams, fisheries, riparian woodland forest, and habitat for currently listed threatened, endangered, and sensitive species.</p> <p>Action: Riparian-wetland areas with altered potential (i.e., those riparian-wetland areas that are incapable of reaching potential because of causes that are outside of the control of the BLM) would be managed for their capability.</p> <p>Action: Human-made water developments, such as reservoirs and stock ponds, can develop riparian-wetland characteristics. Those that have the capability to support important wildlife values (such as GRSG habitats and fisheries) would be managed for such to the extent practical, with greater consideration given to the purpose of the development. When constructing or modifying water developments in PH, use RDFs (<b>Appendix D</b>) to mitigate potential impacts from West Nile virus.</p>
<p>Action: Riparian habitat needs would be taken into consideration in developing livestock grazing systems and pasture designs. Some of the techniques that can be used to lessen impacts are changing class of stock from cow/calf pairs to herded sheep or yearlings; either eliminating hot season grazing or scheduling hot season grazing for only one year out of every 3; locating salt away from riparian zones; laying out pasture fences so that each pasture has as much riparian habitat as possible; locating fences so that they do not confine or concentrate livestock near the riparian zone; developing alternative sources of water to lessen the grazing pressure on the riparian habitat; and as a last resort, excluding livestock completely from riparian habitat by protective fencing (BLM 1984).</p> <p>Action: Grazing methods to be implemented include 1) hot season grazing deferment, 2) creation of separate riparian pastures, 3) changes in kind and class of livestock, 4) time control grazing, and 5) other range management practices, such as development of off-site water, salting, development of shade sources, herding, insect control, or early use pastures. A) All spring developments would be fenced if needed to protect associated riparian vegetation; B) salt and</p>	<p>No similar action.</p>	<p>No similar action.</p>	<p>Action: Within PH, reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Use fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by GRSG in summer. Hot season use of riparian and wet meadow complexes may be authorized where consistent with overall GRSG habitat objectives and where use is currently resulting in vegetative conditions that are in conformance with land health standards.</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
mineral blocks and supplemental feeding would only be allowed at least 0.25 mile or farther from riparian-wetland areas, where possible; C) water developments would be built away from stream riparian-wetland areas where possible; D) study exclosures would be put in place on key areas and areas representative of common riparian-wetland types and types about which there are questions, to compare management progress, to demonstrate the values of proper management, and to confirm potential and recovery rates (BLM 1994).			
No similar action.	Action: Authorize new water development for diversion from spring or seep source only when PH would benefit from the development. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve GRSG habitat.	Action: Authorize no new water developments for diversion from spring or seep sources within PH and GH.	Action: In PH, management emphasis would be placed on riparian and wetland potential associated with springs and seeps. Water from other sources would be prioritized to develop grazing management infrastructure. New water development for diversion from spring or seeps would be authorized only when no other sources are available and where such considerations would be neutral or beneficial to GRSG.  Action: Human-made water developments, such as reservoirs and stock ponds, can develop riparian-wetland characteristics. Those that have the capability to support important wildlife values (such as GRSG habitats and fisheries) would be managed for such to the extent practical, with greater consideration given to the purpose of the development. When constructing or modifying water developments in PH, use RDFs ( <b>Appendix D</b> ) to mitigate potential impacts from West Nile virus.
No similar action.	Action: Analyze springs, seeps, and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within PH. Make modifications where necessary, considering impacts on other water uses when such considerations are neutral or beneficial to GRSG.	Action: Analyze springs, seeps, and associated water developments to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within PH and GH. Make modifications where necessary, including dismantling water developments.	Action: Analyze springs, seeps, and associated pipelines during the allotment evaluation and watershed planning process to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within PH. Make modifications, where necessary, in accordance with Montana water law, considering impacts on other water uses, when such considerations are neutral or beneficial to GRSG.
<b>Treatments to Increase Forage for Livestock/Wild Ungulates (Hoofed Animals)</b>			
No similar objective.	No similar objective.	Objective: Develop and implement methods for prioritizing and restoring sagebrush steppe invaded by nonnative plants.	Objective: Develop and implement (as budgets and workloads allow) methods for prioritizing and restoring sagebrush steppe invaded by nonnative plants.
No similar action.	Action: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to PH 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 PH, then no restoration would be necessary. Assess the compatibility of these seedings for GRSG habitat or as a component of a grazing system during the land health assessments.	Action: Evaluate the role of existing seedings that are composed of primarily introduced perennial grasses in and adjacent to PH and GH to determine if they should be restored to sagebrush or habitat of higher quality for GRSG. If these seedings provide value in conserving or enhancing GRSG habitats, then no restoration would be necessary. Assess the compatibility of these seedings for GRSG habitat during the land health assessments.	Action: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to PH to determine if they should be restored to sagebrush or habitat of higher quality for GRSG. If these seedings are part of a grazing management plan that is providing value in conserving or enhancing native rangelands in PH and other priority wildlife habitats, then no restoration would be necessary. Assess the compatibility of these seedings for GRSG habitat or as a component of a grazing system during land health assessments.
Action: Integrated vegetation management would be used to control, suppress, and eradicate, where possible, noxious and invasive species, in accordance with BLM Handbook H-1740-2.			
Action: Noxious weed control on affected grazing allotments would be implemented through Weed Control Cooperative Range Improvement Project Agreements.	No similar action.	No similar action.	Action: Noxious weed control on affected grazing allotments would be implemented through Weed Control Cooperative Range Improvement Project Agreements.

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<b>Structural Range Improvements and Livestock Management Tools</b>			
Action: Range improvements generally would be designed to achieve both wildlife and range objectives. Existing fences may be modified and new fences would be built so as to allow wildlife passage (BLM 1984).	Action: In PH, 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 cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including movable 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.	No similar action.	Action: In PH, site and design any new structural range improvements and location of supplements (salt or protein blocks) to conserve, enhance, or restore said habitat through an improved grazing management system relative to GRSG habitat objectives. Structural range improvements, in this context, include cattle guards, fences, exclosures, corrals, or other livestock handling structures; pipelines, troughs, storage tanks (including movable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels, and spring developments.  Action: Potential for invasive species establishment or increase following construction would be considered in the project planning process and monitored and treated post-construction. Projects would be designed to the extent practical to reduce or eliminate the establishment of new two-track roads and trails that may be created during construction and maintenance.
No similar action.	Action: When developing or modifying water developments in PH, use applicable RDFs ( <b>Appendix C</b> ) to mitigate potential impacts from West Nile virus.	Action: Same as Alternative B, except applies to both PH and GH ( <b>Appendix C</b> ).	Action: Same as Alternative B ( <b>Appendix D</b> ).
No similar action.	Action: In PH, evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance, or restore GRSG habitat. <ul style="list-style-type: none"> <li>To reduce outright GRSG strikes and deaths, remove, modify, or mark fences in high risk areas within PH, based on proximity to lek, lek size, and topography.</li> <li>In PH, monitor for and treat invasive species associated with existing range improvements.</li> </ul>	Action: In PH and GH, evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance, or restore GRSG habitat. <ul style="list-style-type: none"> <li>Remove, modify, or mark fences in areas of moderate or high risk of GRSG strikes within GRSG habitat, based on proximity to lek, lek size, and topography (Christiansen 2009; Stevens 2011).</li> <li>In PH, monitor for and treat invasive species associated with existing range improvements.</li> </ul>	Action: During the allotment evaluation and watershed planning process (typically every 10 years), examine existing structural range improvements and location of supplements (salt or protein blocks) to ensure they conserve, enhance or restore PH. <ul style="list-style-type: none"> <li>Identify and mark fences in high risk areas within PH, based on proximity to lek, lek size, and topography. During the allotment evaluation and watershed planning process, examine existing structural range improvements to ensure they conserve, enhance, or restore PH.</li> <li>In PH and GH, monitor for and treat invasive species associated with existing range improvements.</li> </ul>
Action: A minimum rest period from livestock grazing of 2 growing seasons would be required after any major vegetative disturbance. More rest may be required, depending on the situation. Major disturbances are defined as mechanical manipulation of the range, such as chiseling and seeding. Requirements for rest following fire (wild or prescribed) would depend on a variety of factors including the type of fuel, time of burn, accessibility of the burned area to livestock, and climatic factors post-burn. Specific timing and the type of rest would be determined at the site specific environmental assessment phase (BLM 1994).	No similar action.	No similar action.	Action: In PH and GH, site-specific requirements for resting or deferring areas from livestock grazing following fire would depend on a variety of factors, including resource objectives, the type of fuel, time and intensity of burn, accessibility of the burned area to livestock and post-burn climactic factors.
<b>Retirement of Grazing Privileges</b>			
No similar action.	Action: Maintain retirement of permitted grazing uses as an option in PH when the current permittee is willing to retire grazing on all or part of an allotment. Analyze the adverse impacts of no livestock use on wildfire and invasive species threats (Crawford et al. 2004) in evaluating retirement proposals.	Action: Same as Alternative B, except applies to both PH and GH.	Action: In PH, when a current grazing permittee/lessee is willing to relinquish grazing preference on all or part of an allotment, the associated authorized use would become vacated from the base property.  Where allotments are not meeting standards for rangeland health due to current livestock, reductions of authorized use, temporary closures of allotments and modifications of terms and conditions would be

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>implemented as appropriate. If upon reevaluation of land health standards it is determined that they are still not met, consider making grazing preference unavailable through the land use planning process. Any unavailability of grazing preference, in full or in part would be documented through the land use planning process after consultation, cooperation and coordination with owners or lessees having lands or managing resources within the allotment area, the affected cooperative state grazing district and interested public. Analyze the adverse impacts of no livestock use on wildfire, invasive species threats and socio-economics in evaluating retirement proposals.</p>			
<p><b>Fluid Minerals</b> <b>Leased Federal Fluid Mineral Estate</b></p>			
<p>No similar action.</p>	<p>Action: Allow geophysical exploration within PH to obtain exploratory information for areas outside of and adjacent to PH areas. Allow only geophysical operations by helicopter-portable drilling methods and in accordance with seasonal timing restrictions and other restrictions that may apply.</p>	<p>Action: Allow geophysical exploration within PH and GH areas to obtain exploratory information for areas outside of and adjacent to GRSG habitat areas. Allow only geophysical operations by helicopter-portable drilling methods and in accordance with seasonal timing restrictions or other restrictions that may apply. Geophysical exploration would be subject to seasonal restrictions that preclude activities in breeding, nesting, brood rearing, and winter habitats during GRSG season of use.</p> <p>Action: No new geophysical exploration permits would be issued.</p>	<p>Action: Same as Alternative B.</p>
<p>No similar action in the RMP. Standard stipulations (see <b>Appendix J</b>, Oil and Gas Lease Stipulations) would apply existing leases.</p> <p>Follow standards and guidelines found in <i>Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development</i> (The Gold Book 2007).</p> <p>NOTE: COA means a site-specific requirement included in an approved application for permit to drill (APD) or Sundry Notice that may limit or amend the specific actions proposed by the operator. COAs minimize, mitigate, or prevent impacts on BLM-administered lands or other resources. BMPs may be incorporated as a COA (Source – Onshore Oil and Gas Order Number 1, II. Definitions).</p>	<p>Action: In PH, apply the following 9 conservation measures through RMP implementation decisions (e.g., approval of an APD and Sundry Notice) and on completion of the environmental record of review (43 CFR, Part 3162.5), including appropriate documentation of compliance with NEPA. In this process evaluate, among other things:</p> <ul style="list-style-type: none"> <li>• Whether the conservation measure is “reasonable” (43 CFR, Part 3101.1-2) with the valid existing rights and</li> <li>• Whether the action is in conformance with the approved RMP</li> </ul> <p>Provide the following 9 conservation measures as terms and conditions of the approved RMP:</p> <p>1) Do not allow new surface occupancy on federal leases within PH; this includes winter concentration areas during any time of the year. Consider an exception:</p> <ul style="list-style-type: none"> <li>- If the lease is entirely within PH, apply a 4-mile no surface occupancy (NSO) stipulation around the lek and limit permitted disturbances to one per section, with no more than 3% surface disturbance in that section.</li> <li>- If the entire lease is within the 4-mile lek perimeter, limit permitted disturbances to one per section, with no more than 3% surface disturbances in that section. Require any development to be placed at the most</li> </ul>	<p>Action: In PH and GH, apply the following conservation measures as COAs at the project and well permitting stages, and through RMP implementation decisions and on completion of the environmental record of review (43 CFR, Part 3162.5), including appropriate documentation of compliance with NEPA. In this process evaluate, among other things:</p> <ul style="list-style-type: none"> <li>• Whether the conservation measure is “reasonable” (43 CFR, Part 3101.1-2) with the valid existing rights and</li> <li>• Whether the action is in conformance with the approved RMP</li> </ul> <p>Provide the following 9 conservation measures as terms and conditions of the approved RMP:</p> <p>1) Do not allow new surface occupancy on federal leases within PH and GH; this includes winter concentration areas during any time of the year. Consider an exception:</p> <ul style="list-style-type: none"> <li>- If the lease is entirely within PH, apply a 4-mile NSO around the lek and limit permitted disturbances to one per section, with no more than 3% surface disturbance in that section.</li> <li>- If the entire lease is within the 4-mile lek perimeter, limit permitted disturbances to one per section, with no more than 3% surface disturbances in that section. Require any development to be placed at</li> </ul>	<p>Action: During implementation level review and decisions, (e.g., approval of an APD or Sundry Notice) and on 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:</p> <ul style="list-style-type: none"> <li>• Whether the conservation measure is reasonable (43 CFR, Part 3101.1-2) with the valid existing rights and</li> <li>• Whether the action is in conformance with the approved RMP</li> </ul> <p>The following operating constraints would be applied to existing leases as COAs in PH and GH.</p> <p>Exceptions may be granted by the authorized officer if an environmental review demonstrates that effects could be mitigated to an acceptable level, if habitat for the species is not present in the area, or if portions of the area can be occupied without affecting GRSG. Exceptions may also be granted where the short-term effects on GRSG within PH and GH 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.</p> <p>1) Surface-disturbing/disruptive activities would avoid or minimize disturbance to GRSG or their habitat. Except as identified above or during emergency situations, activities would not compromise</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
	<p>distal part of the lease from the lek, or, depending on topography and other habitat aspects, in an area that is less demonstrably harmful to GRSG.</p> <ol style="list-style-type: none"> <li>2) Apply a seasonal restriction on exploratory drilling that prohibits surface-disturbing activities during the nesting and early brood-rearing season in all PH during this period.</li> <li>3) The BLM would closely examine the applicability of categorical exclusions in PH. If extraordinary circumstances review is applicable, the BLM should determine whether those circumstances exist.</li> <li>4) Complete master development plans in lieu of application for APD-by-APD processing for all but wildcat wells.</li> <li>5) When permitting APDs on existing leases that are not yet developed, the proposed surface disturbance cannot exceed 3% for that area. Consider an exception if:               <ul style="list-style-type: none"> <li>- Additional, effective mitigation is demonstrated to offset the resulting loss of GRSG (see Objectives).                   <ol style="list-style-type: none"> <li>a. When necessary, conduct additional effective mitigation in PH or, less preferably, in GH (depending on the area-specific ability to increase GRSG populations).</li> <li>b. Conduct additional effective mitigation first within the same population area where the impact is realized; if not possible, conduct mitigation within the same management zone as the impact, in accordance with 2006 WAFWA Strategy (page 2-17).</li> </ol> </li> </ul> </li> <li>6) Require unitization when deemed necessary for proper development and operation of an area (with strong oversight and monitoring) to minimize adverse impacts on GRSG according to the Federal Lease Form, 3100-11, Sections 4 and 6.</li> <li>7) Identify areas where acquisitions (including subsurface mineral rights) or conservation easements would benefit GRSG habitat.</li> <li>8) For future actions, require a full reclamation bond specific to the site, in accordance with 43 CFR, Parts 3104.2, 3104.3, and 3104.5. Ensure that bonds are sufficient for costs relative to reclamation that would result in full restoration of the lands to their condition prior to disturbance. Base the reclamation costs on the assumption that contractors for the BLM would perform the work.</li> <li>9) Make applicable RDFs (<b>Appendix C</b>) mandatory as COAs within PH. RDFs provided in <b>Appendix C</b> would be site-specific restrictions applied to permits to drill as COAs after the completion of site-specific NEPA analysis. Standard stipulations (see <b>Appendix J</b>) would apply existing leases.</li> </ol>	<p>the most distal part of the lease from the lek or, depending on topography and other habitat aspects, in an area that is less demonstrably harmful to GRSG.</p> <ol style="list-style-type: none"> <li>2) Apply a seasonal restriction on exploratory drilling that prohibits surface-disturbing activities during the nesting and brood-rearing season in all PH during this period. This seasonal restriction shall also apply to related activities that are disruptive to GRSG, including vehicle traffic and other human presence.</li> <li>3) The BLM should closely examine the applicability of categorical exclusions in PH. If extraordinary circumstances review is applicable, the BLM should determine whether those circumstances exist.</li> <li>4) Complete master development plans in lieu of APD-by-APD processing for all but wildcat wells.</li> <li>5) When permitting APDs on existing leases that are not yet developed, the proposed surface disturbance cannot exceed 3% per section for that area. Consider an exception if:               <ul style="list-style-type: none"> <li>- Additional, effective mitigation is demonstrated to offset the resulting loss of GRSG (see Objectives).                   <ol style="list-style-type: none"> <li>a. When necessary, conduct additional effective mitigation in PH or, less preferably, GH (depending on the area-specific ability to increase GRSG populations)</li> <li>b. Conduct additional effective mitigation first within the same population area where the impact is realized, and, if not possible, then conduct mitigation within the same management zone as the impact, in accordance with 2006 WAFWA Strategy, page 2-17.</li> </ol> </li> </ul> </li> <li>6) Require unitization when deemed necessary for proper development and operation of an area (with strong oversight and monitoring) to minimize adverse impacts on GRSG, according to the Federal Lease Form, 3100-11, Sections 4 and 6.</li> <li>7) Identify areas where acquisitions (including subsurface mineral rights) or conservation easements would benefit GRSG habitat.</li> <li>8) For future actions, require a full reclamation bond specific to the site, in accordance with 43 CFR, Parts 3104.2, 3104.3, and 3104.5. Ensure bonds are sufficient for costs relative to reclamation that would result in full restoration of the lands to their condition prior to disturbance. Base the reclamation costs on the assumption that contractors for the BLM would perform the work.</li> <li>9) Make applicable RDFs (<b>Appendix C</b>) mandatory as COAs within PH and GH. RDFs provided in <b>Appendix C</b> would be site-specific restrictions applied to permits</li> </ol>	<p>the functionality of the habitat.</p> <ol style="list-style-type: none"> <li>2) Continuous noise (related to long-term operations or activities) would be no greater than 32 decibels at the perimeter of the lek and important seasonal habitats.</li> <li>3) Temporary noise (related to, for example, installation, maintenance, one-time use, and emergency operations) exceeding 32 decibels at the perimeter of a lek or surface disturbing/disruptive activities may be allowed, but only from 9 a.m. to 6 p.m., between March 15 and June 30.</li> <li>4) Manage water developments to reduce the spread of West Nile virus within GRSG habitat areas.</li> <li>5) Site or minimize linear ROW to reduce disturbance to sagebrush habitats.</li> <li>6) Maximize placement of new utility developments (such as power lines and pipelines) and transportation routes in existing utility or transportation corridors.</li> <li>7) Power lines would be buried, eliminated, designed, or sited in a manner that does not impact GRSG.</li> <li>8) Placement of other high profile structures, exceeding 10 feet in height, would be eliminated, designed, or sited in a manner that does not impact GRSG.</li> <li>9) Production facilities must be remotely monitored, and all permit applications must contain a plan to reduce the frequency of vehicle use.</li> <li>10) Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, top-soiling, and revegetating cut and fill slopes.</li> <li>11) Restore disturbed areas at final reclamation to pre-disturbance conditions or desired plant community.</li> <li>12) Permanent (longer than two months) structures that create movement must be designed or sited to minimize impacts on GRSG.</li> <li>13) Consider using off-site mitigation within the same PH (e.g., creating sagebrush habitat, improving brood rearing habitat, or purchasing conservation easements) with proponent dollars to offset habitat losses (Washington Office-IM 2008-204).</li> <li>14) Consider creating 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 within the same PH based on the estimated cost of habitat treatments or other mitigation needed to maintain the functions of impacted habitats. Off-site mitigation should be considered only 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.</li> <li>15) Make applicable RDFs (<b>Appendix D</b>) mandatory as COAs within PH and GH. RDFs provided in <b>Appendix D</b> would be site-specific restrictions applied to permits to drill as COAs after the completion of site-specific NEPA analysis. Standard stipulations</li> </ol>

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
		to drill as COAs after the completion of site-specific NEPA analysis. Standard stipulations (see <b>Appendix J</b> ) would apply existing leases.	(see <b>Appendix J</b> ) would apply existing leases.
<b>Solid Minerals</b>			
<b>Coal - There is no coal potential in the planning area.</b>			
<p>Action: Surface occupancy generally would be prohibited within public road corridors, ROWs, floodplains, and key wildlife areas (BLM 1984).</p> <p>Action: The planning area would be available for coal exploration licenses. See <b>Figure 2-9</b>, Solid Leasable and Salable Minerals – Alternative A (<b>Appendix A</b>). Before exploration licenses and licenses to mine are approved, a project-specific environmental review document would be prepared to assess impacts and develop mitigation measures.</p> <p>Action: Prior to issuing coal leases, unsuitability criteria would apply and a plan amendment will be prepared (BLM 1994).</p>	<p>Action: <i>Surface mines</i>: In PH, find unsuitable all coal surface mining under the criteria set forth in 43 CFR, Part 3461.5 (385,693 acres). See <b>Figure 2-10</b>, Solid Leasable and Salable Minerals – Alternative B (<b>Appendix A</b>).</p>	<p>Action: <i>Surface mines</i>: In PH and GH, find unsuitable all coal surface mining under the criteria set forth in 43 CFR, Part 3461.5 (639,927 acres). See <b>Figure 2-11</b>, Solid Leasable and Salable Minerals – Alternative C (<b>Appendix A</b>).</p>	<p>Action: The planning area would be available for coal exploration licenses. See <b>Figure 2-12</b>, Solid Leasable and Salable Minerals – Alternative D (<b>Appendix A</b>). Before exploration licenses and licenses to mine are approved, a project-specific environmental review document would be prepared to assess impacts and to develop mitigation measures through the BMPs set forth in <b>Appendix D</b>.</p> <p>Action: On a case-by-case basis, unsuitability criteria would be applied, in accordance with 43 CFR, Part 3461.5, and a plan amendment would be prepared.</p>
No similar action.	Action: <i>Subsurface mines</i> —Grant no new mining leases unless all surface disturbances (appurtenant facilities) are placed outside of the PH.	Action: Same as Alternative B, except applies to both PH and GH.	No similar action.
No existing coal leases.	<p>Action: For coal mining operations on existing leases:</p> <p><i>Subsurface mining</i>—In PH, place any new appurtenant facilities outside of PH. Where new appurtenant facilities associated with the existing lease cannot be located outside the PH, collocate new facilities within existing disturbed areas. If this is not possible, then build any new appurtenant facilities to the absolute minimum standard necessary.</p>	Action: Same as Alternative B, except applies to both PH and GH.	No similar action.
No similar action.	<p>Action: In GH, 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.</p> <p>Action: Use additional effective mitigation to offset impacts, as appropriate (determined by local options/needs).</p>	No similar action.	No similar action.
<b>Locatable Minerals</b>			
<p>Action: Analyze proposed action in Plan of Operations and apply mitigating measures needed to prevent unnecessary or undue degradation (BLM 1994)<sup>1</sup>.</p> <p>Action: Before the BLM approves a Plan of Operations on existing mining claims in areas withdrawn, it would conduct</p>	<p>Action: In PH, recommend withdrawal from mineral entry based on risk to the GRSG and its habitat from conflicting locatable mineral potential and development (279,097 acres).</p> <ul style="list-style-type: none"> <li>• Make any existing mining claims within the withdrawal area subject to validity exams or buy out. In Plan of Operations required prior to any proposed surface-</li> </ul>	<p>Action: Same as Alternative B, except applies to both PH and GH (453,969 acres). BMPS needed to prevent unnecessary or undue degradation would be applied (<b>Appendix C</b>).</p> <p>See <b>Figure 2-15</b>, Withdrawals and Recommend for Withdrawal - Alternative C (<b>Appendix A</b>).</p>	<p>Action: Same as Alternative A. See <b>Figure 2-16</b>, Withdrawals and Recommend for Withdrawal - Alternative D (<b>Appendix A</b>).</p> <p>Action: Locatable minerals exploration and development under the mining laws are not authorized under the discretion of the field manager but are reviewed (Notice and Plan of Operations) and</p>

<sup>1</sup> Unnecessary or undue degradation means conditions, activities, or practices that (43 CFR 3809.5): (1) Fail to comply with one or more of the following: the performance standards in Section 3809.420, the terms and conditions of an approved Plan of Operations, operations described in a complete notice, and other federal and state laws related to environmental protection and protection of cultural resources; (2) Are not “reasonably incident” to prospecting, mining, or processing operations as defined in Section 3715. 0-5 of this chapter; or (3) Fail to attain a stated level of protection or reclamation required by specific laws in areas such as the California Desert Conservation Area, Wild and Scenic Rivers, BLM-administered portions of the National Wilderness System, and BLM-administered National Monuments and National Conservation Areas.

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>validity examinations. If the claims did not contain a discovery, within the meaning of the mining laws, the claims would be declared null and void and the Plan of Operations would be denied. The BLM would consider purchasing valid claims where activities threaten the resource values protected by the withdrawal (BLM 1994).</p> <p>Action: Analyze proposed action in Plan of Operations and apply mitigating measures needed to prevent unnecessary or undue degradation (BLM 1994).</p> <p>Action: Screen Notices for impacts that constitute unnecessary or undue degradation (BLM 1994).</p> <p>See <b>Figure 2-13</b>, Withdrawals and Recommend for Withdrawal - Alternative A (<b>Appendix A</b>).</p>	<p>disturbing activities, include the following:</p> <ul style="list-style-type: none"> <li>o Additional, effective mitigation in perpetuity for conservation (in accordance with existing policy, Washington Office IM 2008-204). Example: purchase private land and mineral rights or severed subsurface mineral rights within the priority area and deed to the US Government).</li> <li>o Consider seasonal restrictions if deemed effective.</li> <li>o BMPS needed to prevent unnecessary or undue degradation would be applied (<b>Appendix C</b>).</li> </ul> <p>See <b>Figure 2-14</b>, Withdrawals and Recommend for Withdrawal - Alternative B (<b>Appendix A</b>).</p>		<p>approved (Plan of Operations) to prevent unnecessary or undue degradation. Proposed actions under Plan of Operations would be analyzed on a case-by-case basis in coordination with Montana Department of Environmental Quality (MTDEQ), and BMPs (<b>Appendix D</b>) would be suggested prevent unnecessary or undue degradation to GRSG habitat.</p> <p>Action: At a minimum, annual compliance inspections would be conducted on each active Notice or Plan of Operations.</p>
<b>Nonenergy Leasable Minerals</b>			
<p>No similar action.</p> <p><i>NOTE: Application of current BMP.</i></p>	<p>Action: Close PH to nonenergy leasable mineral leasing. This includes not permitting any new leases to expand an existing mine (279,097 acres).</p>	<p>Action: Same as Alternative B, except applies to both PH and GH (453,969 acres).</p>	<p>No similar action.</p>
<p>Action: Prospecting permits would be issued after appropriate environmental review to assess impacts and develop mitigating measures (BLM 1994).</p>	<p>Action: For existing nonenergy leasable mineral leases in PH, in addition to the solid minerals RDFs (<b>Appendix C</b>), follow the same RDFs applied to fluid minerals (<b>Appendix C</b>), when wells are used for solution mining.</p>	<p>Action: Same as Alternative B, except applies to both PH and GH.</p>	<p>Action: In PH, prospecting permits may be issued after appropriate environmental review to assess impacts and to develop RDFs set forth in <b>Appendix D</b>. Prospecting permits are considered on a case-by-case basis and are issued at the discretion of the Montana BLM State Office. If activity under the permit application cannot be mitigated to prevent unnecessary or undue degradation to GRSG habitat, the field manager would not recommend issuing the permit.</p>
<b>Salable Minerals</b>			
<p>Action: 2,437 acres within PGH and 101 acres within PPH are closed to salable minerals disposal. See <b>Figure 2-9 (Appendix A)</b>.</p>	<p>Action: Close PH to salable minerals disposal (279,097 acres). See <b>Figure 2-10 (Appendix A)</b>.</p>	<p>Action: Close PH and GH to salable minerals disposal (453,969 acres). See <b>Figure 2-11 (Appendix A)</b>.</p>	<p>Action: Same as Alternative A. See <b>Figure 2-9 (Appendix A)</b>.</p>
<p>Action: The BLM would issue sales contracts for salable minerals where disposal is deemed to be in the public interest (<b>Figure 2-9, Appendix A</b>), while providing for reclamation of mined lands and preventing unnecessary or undue impact on nonmineral resources. Salable minerals permits are considered on a case-by-case basis and are issued at the discretion of the area manager (BLM 1994).</p>	<p>Action: No similar action.</p>	<p>Action: No similar action.</p>	<p>Action: In PH, the BLM would issue permits for salable minerals where disposal is deemed to be in the public interest (<b>Figure 2-9, Appendix A</b>), while providing for reclamation of mined lands and preventing unnecessary or undue degradation (<b>Appendix D</b>). Salable mineral permits are considered on a case-by-case basis and are issued at the discretion of the field manager. If activity under the permit application cannot be mitigated to prevent unnecessary or undue degradation to GRSG habitat, the permit would not be issued.</p>
<p>Action: The BLM would issue sales contracts for salable minerals where disposal is deemed to be in the public interest, while providing for reclamation of mined lands and preventing unnecessary or undue impact on nonmineral resources (BLM 1994).</p>	<p>Action: In PH, restore salable mineral pits no longer in use to meet GRSG habitat conservation objectives.</p>	<p>Action: Same as Alternative B, except applies to both PH and GH.</p>	<p>Action: Same as Alternative B.</p>
<b>Mineral Split Estate</b>			
<p>The BLM manages 700 million acres of subsurface mineral estate nationwide, including approximately 58 million acres where the surface is privately owned. In many cases, the surface rights and mineral rights were severed under the terms of the nation's homesteading laws. These and other federal laws, regulations, and BLM policy directives, some</p>	<p>Action: Where the federal government owns the surface, and the mineral estate is not in federal ownership in PH, apply appropriate fluid mineral RDFs (<b>Appendix C</b>) to surface development.</p>	<p>Action: Same as Alternative B, except applies to both PH and GH.</p>	<p>Action: Where the federal government owns the surface, and the mineral estate is not in federal ownership in PH, apply appropriate fluid mineral RDFs (<b>Appendix D</b>) to surface development.</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>noted below, give managers the authority and direction for administering the development of federal oil and natural gas resources beneath privately owned surface.</p> <p><b>Planning and Leasing</b></p> <ul style="list-style-type: none"> <li>• Must involve the public when preparing land use plans and amendments</li> <li>• Must notify the public when oil and gas lease sales have been scheduled</li> </ul> <p><b>Permitting</b></p> <ul style="list-style-type: none"> <li>• Encourages the lessee/operator to contact the surface owner as early as possible when operations are contemplated</li> <li>• Requires the lessee/operator to certify that a good faith effort has been made to negotiate a surface use agreement with the surface owner</li> </ul> <p><b>Drilling and Production</b></p> <ul style="list-style-type: none"> <li>• Conducts compliance inspections, consults with surface owner as appropriate, and takes enforcement action when necessary to ensure permit compliance</li> </ul> <p><b>Surface Reclamation</b></p> <ul style="list-style-type: none"> <li>• Must carefully consider the surface owner's views on reclamation requirements and seek concurrence that final reclamation is satisfactory</li> </ul>			
No similar action.	Action: Where the federal government owns the mineral estate in PH, and the surface is not in federal ownership, apply the same conservation measures applied on BLM-administered lands.	Action: Same as Alternative B, except applies to both PH and GH.	Action: Where the federal government owns the mineral estate in PH and the surface is not in federal ownership, apply the same conservation measures applied on BLM-administered lands when federal action (mineral exploration or development) occurs. See appropriate mineral section for more information.
<b>Fire and Fuels Management</b>			
<b>Fuels Management</b>			
<p>Objective: Prescribed burning would continue to be used in support of resource management objectives (BLM 1984).</p> <p>Objective: Prescribed fire may be used to meet resource objectives, such as restoring fire-adapted grass and shrublands, or increasing variation of age classes in shrublands. Treatments would be designed to achieve mosaic patterns, which would also reduce the potential of entire stands being destroyed by wildland fire. Most sagebrush treatments would be on mountain big sagebrush or silver sagebrush (BLM 2003a).</p>	Objective: Within the analysis area, prescribed burning and various mechanical vegetation treatments may continue to be used to meet or support resource management objectives, given that special consideration for the protection and maintenance of sagebrush ecosystems is incorporated into the design and implementation of treatments.		
Action: Land treatments would be designed to maintain sagebrush levels within the desired canopy cover range 15 to 50% and to increase the amounts of succulent forbs. Controlled burning in conifer and sagebrush types would be done on an individual basis to improve wildlife habitat (BLM	Action: In PH, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems. <ul style="list-style-type: none"> <li>○ Do not reduce sagebrush canopy cover to less than 15% unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection</li> </ul>	Action: In PH and GH, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems. <ul style="list-style-type: none"> <li>○ Do not reduce sagebrush canopy cover to less than 15%, unless a fuels management objective requires</li> </ul>	Action: In PH and GH, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems. <ul style="list-style-type: none"> <li>○ Do not reduce sagebrush canopy cover to less than 15%, unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of PH and conserve</li> </ul>

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
<p>1994).</p> <p>Action: Prescribed burning would be administered on an individual basis in grassland, sagebrush, and conifer types to improve wildlife habitat and vegetation production (BLM 1994).</p> <p>Action: Burning would be done on a limited basis to improve wildlife and livestock forage in dense pine-juniper stands throughout the Missouri Breaks and to improve vegetation productivity on other upland sites, including sagebrush (BLM 1994).</p> <p>Action: Mechanical treatments and prescribed fire would primarily be used to remove encroaching conifers or open the canopy on dense, stagnant, and even-aged stands of sagebrush that are at risk of destruction by wildland fire. In shrublands where mechanical treatments and prescribed fire are used against conifer encroachment, the density and canopy of shrub stands would be reduced in treated areas. The duration of the reduction would depend on whether the shrubs sprout after fire and post-fire management actions, such as reseeding (BLM 2003a).</p> <p>Action: Chemical weed treatments would be applied where other fuels treatments would create conditions favorable for noxious weeds or other undesirable invasive species to expand. For example, weeds are often present in areas of conifer encroachment. When the canopy is opened by mechanical treatments or prescribed burns, the conditions are favorable for the weeds or invasive species to expand. Nearly all of the weed treatments would be applied either before or after the area is treated with prescribed fire or mechanical methods (BLM 2003a).</p> <p>Action: A minimum rest period from livestock grazing of 2 growing seasons would be required after any major vegetative disturbance. More rest may be required, depending on the situation. Major disturbances are defined as mechanical manipulation of the range, such as chiseling and seeding. Requirements for rest following wild or prescribed fire would depend on a variety of factors, including the type of fuel, time of burn, accessibility of the burned area to livestock, and climatic factors post-burn. Specific timing and the type of rest would be determined at the site-specific environmental assessment phase (BLM 1994).</p>	<p>of PH 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.</p> <ul style="list-style-type: none"> <li>o Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in PH.</li> <li>o Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and would maintain winter range habitat quality.</li> <li>o Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species). However, if as a last resort and after all other treatment opportunities have been explored and site-specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory.</li> <li>o Monitor and control invasive vegetation post-treatment.</li> <li>o Rest treated areas from grazing for two full growing seasons, unless vegetation recovery dictates otherwise.</li> <li>o 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, nonnative seeds may be used as long as they meet GRSG habitat objective.</li> <li>o Design post fuels management projects to ensure long-term persistence of seeded or pretreatment 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.</li> </ul>	<p>additional reduction in sagebrush cover to meet strategic protection of PH and GH and conserve habitat quality for the species.</p> <ul style="list-style-type: none"> <li>o Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in the NEPA process.</li> <li>o Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present.</li> <li>o Allow no fuels treatments in known winter range, unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and would maintain winter range habitat quality.</li> <li>o Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species). However, if as a last resort and after all other treatment opportunities have been explored and if site-specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered. This would be for stands where cheatgrass is a very minor component in the understory.</li> <li>o Design post fuels management projects to ensure long-term persistence of seeded or pretreatment native plants, including sagebrush. 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.</li> </ul>	<p>habitat quality for the species. Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in the NEPA process.</p> <p>1) Sites should not be burned unless:</p> <ul style="list-style-type: none"> <li>a) Biological and physical limitations of the site and impact on GRSG are identified and determined to be neutral or beneficial to PH, including moisture regimes, soil texture, seed sources, and sagebrush recovery time,</li> <li>b) Management objectives for the site, including those for wildlife, are clearly defined,</li> <li>c) Potential for weed invasion and successional trends are well understood, and</li> <li>d) Capability exists to manage the post-burn site properly, including a funded monitoring schedule, to achieve a healthy sagebrush community. Manage grazing, weeds, reseeding, or other activities that potentially influence the outcome of rehabilitation or treatment in a manner that achieves the desired condition of the burned site.</li> </ul> <ul style="list-style-type: none"> <li>o Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in PH.</li> <li>o Allow no fuels treatments in known GRSG winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and would maintain winter range habitat quality.</li> <li>o Monitor and control invasive vegetation post-treatment.</li> <li>o Requirements for resting or deferring areas from livestock grazing following fire would depend on a variety of factors, including resource objectives, the type of fuel, time and intensity of burn, accessibility of the burned area to livestock, and post-burn climatic factors.</li> </ul>
<p>No similar action.</p>	<p>Action: Design fuels management projects in PH to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design.</p>	<p>No similar action.</p>	<p>Action: Same as Alternative B.</p>

**Table 2-4  
Description of Alternatives A, B, C, and D**

<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
No similar action.	Action: During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels, and implement grazing management that would accomplish this objective. Consult with ecologists to minimize impacts on native perennial grasses.	No similar action.	Action: During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels and implement grazing management that would accomplish this Consult with an interdisciplinary team of resource specialists, as appropriate, to minimize impacts on native perennial grasses.
No similar action.	No similar action.	Action: Any vegetation treatment plan must include pretreatment data on wildlife and habitat condition, must establish nongrazing exclosures, and must include long-term monitoring where treated areas are monitored for at least three years before grazing returns. Continue monitoring for five years after livestock are returned to the area and compare to treated ungrazed exclosures, as well as untreated areas.	No similar action.
No similar action.	Action: In PH, follow RDFs ( <b>Appendix C</b> ).	Action: Same as Alternative B, except applies to both PH and GH. Follow RDFs in <b>Appendix C</b> .	Action: Follow the most current RDFs for fire and fuels ( <b>Appendix D</b> ).
<b>Fire Operations</b>			
Action: Intensive suppression would be applied to areas with high resource values, structures, improvements, oil and gas developments, commercial forest values, sagebrush and juniper areas, fire sensitive woody riparian areas (soil subgroups 6 and 17) and cultural values that require aggressive suppression (BLM 2003a).	Action: In PH, prioritize suppression, after life and property, to conserve the habitat. See <b>Appendix K</b> , GRSG Wildland Fire and Invasive Species Assessment, which would be completed to help further refine fire management actions once this plan is completed.	Action: Same as Alternative B, except applies to both PH and GH. See <b>Appendix K</b> , which would be completed to help further refine fire management actions once this plan is completed.	Action: Same as Alternative B. See <b>Appendix K</b> , which would be completed to help further refine fire management actions once this plan is completed.
Action: Intensive suppression would be applied to areas with high resource values, structures, improvements, oil and gas developments, commercial forest values, sagebrush and juniper areas, fire sensitive woody riparian areas (soil subgroups 6 and 17), and cultural values that require aggressive suppression (BLM 2003a).	Action: In GH, prioritize suppression where wildfires threaten PH.	No similar action.	Action: Same as Alternative B.
No similar action.	Action: In PH, follow RDFs ( <b>Appendix C</b> ).	Action: Same as Alternative B, except applies to both PH and GH. Follow RDFs in <b>Appendix C</b> .	Action: Follow the most current RDFs for fire and fuels ( <b>Appendix D</b> ).
<b>Emergency Stabilization and Rehabilitation</b>			
No similar action.	Action: In PH, prioritize native seed allocation for use in GRSG habitat in years when preferred native seed is in short supply. This may require reallocating native seed from emergency stabilization and rehabilitation (ES&R) projects outside of PH 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, nonnative seeds may be used, as long as they meet GRSG habitat conservation objectives. Reestablishing appropriate sagebrush species/subspecies and important understory plants, relative to site potential, should be the highest priority for rehabilitation.	Action: Same as Alternative B, except applies to both PH and GH.	Action: Same as Alternative B.
No similar action.	Action: In PH, 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 to achieve and maintain the desired condition of ES&R projects to benefit GRSG.	Action: Same as Alternative B, except applies to both PH and GH.	Action: In PH, design post ES&R management to ensure long term persistence of seeded or pre-burn native plants. This could include changes in current resource management to achieve and maintain the desired condition of the restoration effort that benefits GRSG. Modifications to livestock grazing would be made in accordance with BLM grazing regulation 43 CFR 4130.3-3 and after consultation, cooperation and coordination with owners or lessees having lands or managing resources within the affected allotment(s), affected

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
			cooperative state grazing districts and the interested public. Temporary or long-term adjustments in post-restoration livestock use would be implemented by documented agreement or by the decision of the authorized officer.
No similar action.	Action: In PH, consider potential changes in climate when proposing restoration seeding of native plants. Consider collection from the warmer component of the species' current range when selecting native seed.	Action: Same as Alternative B, except applies to PH and GH.	Action: Same as Alternative B.  Action: Develop an appropriate seed mix for the location, based on current climatic data as well as soils/ecological site descriptions.
No similar action.	No similar action.	Action: Post-fire recovery must include establishing adequately sized exclosures (free of livestock grazing) that can be used to assess recovery.	Action: Appropriate pre and post treatment monitoring would be established to document impacts and success of the treatments.
No similar action.	No similar action.	Action: Livestock grazing should be excluded from burned areas until woody and herbaceous plants achieve GRSG habitat objectives.	Action: Requirements for resting or deferring areas from livestock grazing following fire would depend on a variety of factors including resource objectives, the type of fuel, time and intensity of burn, accessibility of the burned area to livestock, and post-burn climatic factors. Compliance with land health standards would be considered when implementing post-fire grazing management.
No similar action.	No similar action.	Action: Where burned GRSG habitat cannot be fenced from other unburned habitat, the entire area (e.g., allotment/pasture) should be closed to grazing until recovered.	Action: Requirements for resting or deferring areas from livestock grazing following fire would depend on a variety of factors, including resource objectives, the type of fuel, time, and intensity of burn, accessibility of the burned area to livestock, and post-burn climatic factors. Compliance with land health standards would be considered when implementing post fire grazing management.
<b>Habitat Restoration and Vegetation Management</b>			
Objective: Grazing methods, land treatments, and other improvements would be designed and monitored to accomplish objectives. The BLM would continue to cooperate with MFWP to determine wildlife habitat needs.	Objective: Within the analysis area, vegetation treatments may continue to be used to meet or support resource management objectives, given special consideration for the protection and maintenance of sagebrush ecosystems is incorporated into the design and implementation of treatments. The BLM would continue to cooperate with the MFWP to determine wildlife habitat needs.		
No similar action.	Action: In PH, prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit GRSG.  Action: Prioritize restoration in seasonal habitats that are thought to be limiting GRSG distribution or abundance.	Action: In PH and GH, prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit GRSG.  Action: Prioritize restoration in seasonal habitats that are thought to be limiting GRSG distribution and abundance and where factors causing degradation have already been addressed (e.g., changes in livestock management).	Action: In PH, prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit GRSG.  Action: In PH and GH, prioritize restoration in seasonal habitats that are thought to be limiting GRSG distribution or abundance.  Action: In PH and GH, consideration for other threatened, endangered, or sensitive species would be evaluated in addition to GRSG when prioritizing restoration projects.
No similar action.	Action: Include GRSG habitat parameters, as defined by Connelly et al. (2000) and Hagen et al. (2007) or, if available, state GRSG conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within PH the highest restoration priority.	Action: Include GRSG habitat objectives in habitat restoration projects. Make meeting these objectives within PH and GH the highest restoration priority.	Action: Manage for suitable GRSG habitat for restoration projects within PH.
Action: Surface-disturbing activities greater than 0.25 acre would require the initiating party to rehabilitate the disturbance. Native species in the site's natural plant community would normally be seeded to revegetate all surface disturbances. Some reclamation may involve introduced species if these species are necessary to stabilize the site. Revegetation species would be determined during the site-specific environmental assessment phase (BLM 1994, page 11).	Action: In PH, 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, nonnative seeds may be used as long as they support GRSG habitat objectives.	Action: Same as Alternative B, except applies to PH and GH.	Action: In PH, require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Nonnative species would be considered when determined to be necessary for emergency stabilization and where required to facilitate natural succession of desired native vegetative communities.

**Table 2-4  
Description of Alternatives A, B, C, and D**

Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
No similar action.	Action: In PH, design post restoration management to ensure long-term persistence. This could include changes in livestock grazing management and travel management to achieve and maintain the desired condition of the restoration that benefits GRSG.	Action: Same as Alternative B, except applies to PH and GH.	Action: In PH, design post restoration management to ensure long-term persistence. This could include changes in current resource management to achieve and maintain the desired condition of the restoration that benefits GRSG. Modifications to livestock grazing would be made in accordance with BLM grazing regulation 43 CFR Part 4130.3-3, and after consultation, cooperation, and coordination with owners or lessees having lands or managing resources within the affected allotment(s), affected cooperative state grazing districts and the interested public. Temporary or long-term adjustments in post-restoration livestock use would be implemented by documented agreement or by the decision of the authorized officer.
No similar action.	Action: In PH, consider potential changes in climate when proposing restoration seeding of native plants. Consider collection from the warmer component of the species' current range when selecting native seed.	Action: Same as Alternative B, except applies to PH and GH.	Action: Same as Alternative B.  Action: Choose appropriate seed mix for the location.
Action: The BLM would manage for succulent vegetation, including a variety of forbs, and would maintain big and silver sage on GRSG wintering and nesting areas with a canopy coverage (line intercept) of 15 to 50% and an effective height of 12 inches (BLM 1994).	Action: In PH, restore native or desirable plants and create landscape patterns that most benefit GRSG.	Action: In PH and GH, exotic seedings would be rehabilitated, interseeded, and restored to recover sagebrush in areas to expand occupied habitats.	Action: In PH, restore native (or desirable) plants and create landscape patterns that most benefit GRSG. Consideration for other threatened, endangered, or sensitive species would be evaluated, in addition to GRSG, when creating landscape habitat patterns.
No similar action.	Action: Make reestablishment of sagebrush cover and desirable understory plants (relative to ecological site potential) the highest priority for restoration in PH.	No similar action.	Action: Make reestablishment of suitable GRSG habitat a high priority for restoration. Other restoration efforts within the field office may take precedence over sagebrush habitat projects, based on future threatened and endangered species listing decisions, funding sources and requirements, access to sites, landowner, and other agency cooperation, potential project success, as well as others. Decisions regarding restoration of habitats within the field office would remain at the discretion of the authorized officer.
No similar action.	Action: In PH, in 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: Same as Alternative B, except applies to PH and GH.	Action: In PH of increased fire frequency, where sagebrush seed is required for GRSG habitat restoration, consider establishing seed harvest areas that are managed for seed production that receive a priority for protection from outside disturbances.
<b>Areas of Critical Environmental Concern</b>			
No similar action.	No similar action.	Action: As described in <b>Appendix E</b> , PH areas for GRSG with at least 4,000 acres of contiguous BLM surface ownership would be designated as ACECs, totaling 96,246 acres. See <b>Figure 2-17</b> , Area of Critical Environmental Concern – Alternative C, in <b>Appendix A</b> ).	No similar action.
Action: BLM would continue to manage 2,463 acres as the Acid Shale-Pine Forest ACEC to protect its unique pine forest and shale landscape.  Management actions are as follows: <ul style="list-style-type: none"> <li>• Limit motorized travel to existing routes and trails</li> <li>• Manage as ROW avoidance area</li> <li>• Prohibit timber harvest</li> <li>• Close to fluid minerals leasing</li> </ul>	Action: BLM would continue to manage 2,463 acres as the Acid Shale-Pine Forest ACEC to protect its unique pine forest and shale landscape.  Action: In addition to those management actions listed in Alternative A, management actions would include conservation measures consistent with the identified management actions and constraints identified for PH under this alternative.	Action: Same as Alternative B.	Action: Same as Alternative B.

BLM 1984: *Headwaters Resource Management Plan/Environmental Impact Statement Record of Decision*

BLM 1994: *Judith Resource Area Resource Management Plan*

BLM 2003a: *Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas*

BLM 2003b: *Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota*

**2.11 COMPARISON OF ALLEVIATED THREATS TO GRSG IN LEWISTOWN FIELD OFFICE BY ALTERNATIVE**

**Table 2-5**, Summary of Impacts on GRSG, presents a comparison summary of impacts to GRSG from management actions proposed for the four management alternatives. **Section 4.2**, Greater Sage-Grouse, in **Chapter 4** provides a more detailed impact analysis.

**Table 2-5  
Summary of Impacts on GRSG<sup>1</sup>**

Resource/Resource Use <sup>2</sup>	Alternatives A – D
<b>Summary of Impacts to GRSG from Oil and Gas Development</b>	<p>Alternatives B, C, and D would apply RDFs (<b>Appendix C</b> for Alternatives B and C, and <b>Appendix D</b> for Alternative D) as COAs where appropriate and necessary to drilling permits for currently leased federal minerals. Standard lease stipulations would apply to the existing leases. No new leases would be issued in PPH and PGH or PH and GH under any alternative, based on an existing RMP protest resolution, which requires deferring nominated lease parcels if a special stipulation is required to protect important wildlife values. These conditions and limitations would provide the regulatory mechanisms needed (identified in the COT report [USFWS 2013]) to stop population decline and habitat loss. They would do this by eliminating activities known to negatively impact GRSG and their habitats, and by reducing the threat of habitat loss, degradation and fragmentation.</p>
<b>Summary of Impacts on GRSG from Infrastructure</b>	<p>Overall, Alternative A would have the least protections for GRSG and GRSG habitat from development of infrastructure. Alternative B would have more restrictions on route construction and upgrades, as well as ROWs, than Alternatives A and D, but fewer than Alternative C (some actions under Alternative D are the same as under Alternative B; see <b>Table 2-4</b>).</p> <p>Alternatives B and C exclude PH from new ROWs. This responds directly to the need identified in the COT report (USFWS 2013) to stop population decline and habitat loss by eliminating activities known to negatively impact GRSG and their habitats. Beneficial impacts are from the reduction in the threat of habitat loss, degradation, and fragmentation on BLM-administered lands. Potential adverse indirect effects in GRSG habitat could increase if these activities were excluded from BLM-administered lands because they would still occur on private land without BLM RDFs or BMP guidance. Ownership patterns in LFO (highly fragmented, with public land comprising approximately 17% of the planning area) could substantially increase the length of infrastructure required to enclose BLM ROW exclusion areas. Alternative D would designate PH and GH as ROW avoidance areas because most PH and GH within the planning area are on private lands. The</p>

<sup>1</sup> For a full disclosure of impacts to GRSG, refer to **Section 4.2** in **Chapter 4**.

<sup>2</sup> Resources/Resource Uses identified as threats to the LFO Populations of GRSG in the COT Report are identified with an asterisk\*

**Table 2-5  
Summary of Impacts on GRSG<sup>1</sup>**

<b>Resource/Resource Use<sup>2</sup></b>	<b>Alternatives A – D</b>
	<p>potential to concentrate infrastructure development where appropriate, and to use RDFs and BMPs, would increase direct beneficial effects from infrastructure on GRSG on BLM-administered lands; however, it would substantially reduce indirect adverse effects on a much greater area of adjacent land not administered by the BLM. The benefits of maintaining or improving habitat on most of the PH would exceed the costs on BLM-administered lands and would be more likely to perpetuate a viable GRSG population. Reducing impacts on more of the existing habitat within the planning area is a reason for the ROW avoidance areas rather than ROW exclusion areas in PH and GH under Alternative D. Each action alternative would require collocating new ROWs with existing ROWs in GH. Alternative D would require this of new ROWs in PH also because new ROWs are not excluded in PH.</p> <p>The action alternatives are in agreement with the following conservation objectives/options identified in the COT report specific to infrastructure:</p> <ol style="list-style-type: none"> <li>1. Avoid developing infrastructure within Priority Area for Conservation (PAC) (objective).</li> <li>2. Avoid constructing these features in GRSG habitat, both within and outside of PACs (option).</li> <li>3. Remove transmission lines and roads that are duplicative or are not functional (option).</li> <li>4. Construct transmission line towers to severely reduce or eliminate nesting and perching by avian predators, most notably ravens, thereby reducing human subsidies to those species (option).</li> </ol>
<p><b>Summary of Impacts on GRSG from Agriculture/Urbanization</b></p>	<p>Although agriculture and urbanization have been identified as threats within the LFO planning area, including both the Yellowstone Watershed (Conversion) and Belt Mountain (Urbanization) populations, the BLM has no direct management authority over those types of activities. Under Alternatives B and D, the BLM would take advantage of opportunities to consolidate GRSG habitat through land exchange if the action would benefit GRSG. Alternative C would allow for no disposal of PH or GH, regardless of benefits to GRSG. The LFO may have limited indirect abilities to influence these threats through maintaining appropriate authorized uses (grazing, ROWs, recreation, energy development) of BLM-administered lands that allow for the maintenance of habitat objectives. One specific example is to maintain appropriate levels of livestock grazing, which should discourage the conversion of identified GRSG habitat on private land to improved (nonnative) pasture or cropland.</p> <p>Regarding the following conservation objectives/options identified in the COT report specific to infrastructure:</p>

**Table 2-5  
Summary of Impacts on GRSG<sup>1</sup>**

Resource/Resource Use <sup>2</sup>	Alternatives A – D
	<ul style="list-style-type: none"> <li>• Limit urban and exurban development in GRSG habitat and maintain intact native sagebrush plant communities (objective). Acquire and manage GRSG habitat to maintain intact ecosystems (option).</li> </ul> <p>Alternative D meets the objectives best because of its flexibility. Alternative B meets the objectives but its focus on ROW exclusion areas could lead to greater impacts on non-BLM-administered lands. Alternative C is in agreement with the first objective, but the consequences of its limitations on grazing, including increased fencing and reduced weed control, would not maintain intact GRSG habitat.</p>
<b>Summary of Impacts on GRSG from Grazing</b>	<p>GRSG habitat considerations within livestock grazing allotments would be similar across Alternatives B, C and D. Range improvement restrictions are the same under Alternatives B and D. Under Alternative C (no grazing), the need for increased fencing on BLM-administered land in order to prevent livestock trespass would result in indirect impacts on GRSG, including increased fragmentation, increased potential for wildfire from fine fuel buildup, increased collisions with fences, and increased raptor predation. Additionally, under Alternative C the BLM would lose the current or potential treatment of existing or new infestations of noxious weeds because these weeds are currently treated through agreements with permittees to spray, under the terms and conditions of grazing permits or leases. Under Alternative A, grazing would be managed to achieve the standards of rangeland health, which would address GRSG habitat requirements under most scenarios. However, the potential for project infrastructure up to 0.25 mile of leks under Alternative A could cause fragmentation, raptor perches, and inappropriate fence locations and designs. Alternatives B and D, would also manage grazing to achieve the standards of rangeland health. These alternatives also put specific focus on GRSG habitat requirements in PH to preclude adverse impacts from livestock and project infrastructure. Because Alternative C closes PH and GH to grazing, fine fuels would increase and weed control would be reduced. In addition, actions taken on private land to compensate for loss of public grazing might affect GRSG habitat and could be substantial (for example, miles of fencing would likely be constructed to hold livestock on private lands).</p>
<b>Summary of Impacts on GRSG from Invasive Species</b>	<p>Due to climate conditions, invasive weeds do not currently threaten the planning area on a large scale. Under all alternatives, the spread of weeds would be managed using integrated vegetation management as resources allow. Under Alternative C, grazing would be eliminated in GRSG habitat, which would remove the lessee agreements on weed control and limit resources for addressing invasive weeds.</p>
<b>Summary of Impacts on GRSG from Wildfire and Fuels Treatment</b>	<p>Alternative A manages wildfire effectively but Alternatives B, C and D would provide additional protection to sagebrush habitat during fire management. Under all alternatives, anticipated threats from wildfire remain constant (estimated 2,000 acres burned over a decade).</p>

**Table 2-5  
Summary of Impacts on GRSG<sup>1</sup>**

Resource/Resource Use <sup>2</sup>	Alternatives A – D
<b>Summary of Impacts on GRSG from Solid Mineral Development</b>	Alternatives B and C would be more protective of GRSG and habitat than Alternatives A and D, although Alternative D, in the case of reclamation of salable mineral pits, requires the same action as Alternative B. Effective mitigation for existing mining claims and salable mineral sites is similar across Alternatives B, C and D. Alternative D provides a greater number of BMPs to be considered as necessary and appropriate to mitigate impacts.

**2.12 SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES**

**Table 2-6**, Summary of Environmental Consequences of Alternatives A, B, C, and D, presents a comparison summary of impacts from management actions proposed for the four management alternatives. **Chapter 4** provides a more detailed impact analysis.

**Table 2-6  
Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

Line #	Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
1.	<b>GREATER SAGE-GROUSE</b>			
2.	See <b>Table 2-5</b> for summary of impacts on GRSG.			
3.	<b>LANDS AND REALTY</b>			
4.	No impacts, decision area would remain open to ROWs.	233,219 acres (PH) managed as ROW exclusion area and 112,341 acres managed as ROW avoidance area would prohibit or restrict new ROW authorizations. Could extend processing time for renewals of existing ROW authorizations	345,560 acres (PH and GH) managed as ROW exclusion area. In addition, prohibiting new road construction within 4 miles of active leks would limit development to 21% of the decision area. Exclusion areas could potentially shift	233,219 (PH) acres managed as ROW avoidance area would result in increased application processing time and costs due to the potential need to relocate facilities or due to greater design, mitigation, and siting requirements.

<sup>1</sup> For a full discussion of impacts for any of the resources, refer to the appropriate section in **Chapter 4**.

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		and make siting of new linear or block ROWs more difficult. Exclusion areas could potentially shift development onto private land.	development onto private land.	
<b>5.</b>	<b>VEGETATION (INCLUDING NOXIOUS WEEDS; RIPARIAN AND WETLANDS)</b>			
6.	ROW development would continue to impact vegetation.	ROW exclusion areas in PH (233,219 acres) would preclude loss or alteration of vegetation, and spread of invasive weeds in these areas from development. ROW avoidance areas in GH (112,341 acres) would likely reduce these types of disturbances to vegetation in these areas. Potential indirect impacts on vegetation from developing on private lands.	ROW exclusion areas in PH and GH (345,560 acres) would preclude loss or alteration of vegetation, and spread of invasive weeds from development in these areas. Indirect impacts on vegetation on private lands similar to Alternative B.	ROW avoidance areas in PH (233,219 acres) would reduce, but not eliminate loss or alteration of vegetation, and spread of invasive weeds from development in these areas.
7.	Grazing practices may have negative, neutral, or positive effects on vegetation; land health assessments and other management evaluations would be intended to identify areas of concern to maintain or improve rangeland health, which would improve vegetation condition.	Incorporating GRSG habitat objectives and management considerations into livestock grazing management would reduce, but would not eliminate, impacts from grazing on vegetation communities.	Grazing would be eliminated in PH and GH (reducing available AUMs). Livestock use of riparian zones would be limited to maintain PFC and benefit wildlife habitat. The reduction in grazing AUMs could ultimately reduce rangeland health by facilitating spread of weeds and fuel buildup.	Grazing management would be similar to Alternative B, with increased collaboration with stakeholders, guidance for prioritization of efforts, and increased tools available to improve flexibility in management.
8.	Development of existing fluid	RDFs required as COAs on	RDFs required as COAs on	Reduction of impacts from

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**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	mineral leases would continue to cause impacts on vegetation, including removal or degradation of vegetation and potential spread of invasive species.	existing fluid mineral leases in PH would reduce the impacts on vegetation compared to Alternative A.	existing fluid mineral leases in PH and GH would reduce the impacts on vegetation compared to Alternative A.	applying RDFs similar to Alternative B.
<b>9.</b>	<b>WILDLAND FIRE MANAGEMENT AND ECOLOGY</b>			
10.	Few restrictions on fire and fuels management would have the fewest impacts on fire. Due to the flexibility in management of prescribed and wildland fires, fire suppression costs are likely to be lower compared with all action alternatives	Restrictions in PH (233,219 acres) could impact ability to efficiently manage fuels and could increase costs of vegetation management and fire suppression.	Impacts from seasonal closures and restrictions would be similar to Alternative B but would apply to both GH and PH (345,560 acres). The limitations would be more restrictive under this alternative, resulting in the greatest impacts on the fire and fuels management program.	Impacts would be similar to those described in Alternative C, with restrictions on fuels treatment options in both PH and GH (345,560 acres). Fire suppression actions and related impacts would be the same as described under Alternative C.
11.	Lack of restrictions on resource uses such as mineral development, ROW development, and recreation could mean greater risk of human-induced ignition which could result in an increased need for fire management.	Limitations on resource uses such as recreation, mineral development, and ROW authorizations in PH would decrease the chance of human ignition and consequently decrease wildfire risk.	Limitations on resource uses such as recreation, mineral development, and ROW authorizations would occur, but would include PH and GH; therefore, the risk of human caused ignition would be decreased in both of these areas.	Impacts from recreation, mineral development, and ROW authorizations would be similar to Alternative B.

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
<b>12.</b>	<b>FLUID MINERALS</b>			
13.	Existing oil and gas leases would continue to be developed according to their lease terms. COAs could be applied on a case-by-case basis.	All existing leases on federal oil and gas estate in PH (233,219 acres) would be subject to RDFs and conservation measures applied as COAs. These COAs would place additional limits on siting, design, and operations of fluid mineral development.	Similar to Alternative B except that COAs would be applied to existing leases in PH and GH (345,560 acres).	Similar to Alternative C, COAs would be applied to existing leases in PH and GH (345,560 acres), except with greater flexibility for site-specific modifications.
<b>14.</b>	<b>SOLID LEASABLE MINERALS</b>			
15.	Constraints and closures would cover the smallest area of any alternative; approximately 2,538 acres (less than 1%) of the federal solid mineral estate would remain closed to solid minerals, precluding future leasing in these areas.	All PH (279,097 acres, or 61% of the solid minerals decision area) would be closed to nonenergy solid mineral leasing. RDFs on existing nonenergy solid mineral leases in PH would place limitations on road design, construction, and use; restrict operations to minimize surface disturbance; limit construction; maximize reclamation efforts to meet GRS habitat needs; and place other standards and restrictions on solid mineral operations.	Impacts would be similar to Alternative B except that more acres (453,969 acres, or 100% of the solid minerals decision area) would be closed to nonenergy solid mineral leasing, and more acres with existing leases would be subject to the mandatory application of the solid mineral RDFs.	Management of solid leasable minerals would be similar to Alternative A, except that new prospecting permits would be subject to the RDFs.
<b>16.</b>	<b>SOLID MINERALS (LOCATABLE MINERALS)</b>			
17.	Approximately 2,538 acres (less than 1% of the total federal solid	BLM would recommend to withdrawal an additional	BLM would recommend to withdrawal an additional	Applying BMPs and conservation measures to any

**Table 2-6  
Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

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	mineral estate for locatable minerals) would remain withdrawn to the location of mining claims.	279,097 acres. However, there is no known locatable mineral potential in GRSG habitat, so no effect on locatable minerals is anticipated.  Application of BMPs to any Notice or Plan of Operations would impact locatable mineral development by increasing its costs if it resulted in the application of additional requirements.	453,969 acres. However, there is no known locatable mineral potential in GRSG habitat, so no effect on locatable minerals is anticipated.  Applying BMPs and conservation measures to any Notice or Plan of Operations would result in the same impacts as those described under Alternative B.	Notice or Plan of Operations would result in the same impacts as those described under Alternative B.
<b>18.</b>	<b>SOLID MINERALS (SALABLE MINERALS)</b>			
19.	Constraints and closures would cover the smallest area of any alternative (2,538 acres closed to the disposition of saleable minerals and 0 acres managed as ROW exclusion area), resulting in the fewest restrictions on the disposition of salable minerals.	Construction of new roads in ROW exclusion and avoidance areas would likely decrease, thereby decreasing demand for salable minerals needed for construction and maintenance.  Approximately 279,097 acres of federal mineral estate in PH (61% of the solid minerals decision area) would be closed to salable mineral disposal.  Solid mineral RDFs would apply to existing salable mineral operations in PH and would place limitations on road design, construction, and use; restrict	Because all PH and GH would be closed to salable minerals disposal, the ROW exclusion areas would not impact the salable minerals program.  Approximately 453,969 acres of federal mineral estate in PH and GH (100% of the solid minerals decision area) would be closed to salable mineral disposal, the most of any alternative.  Similar to Alternative B, RDFs would be applied to salable mineral operations in PH and GH. Because more acres would be within PH and GH under	Construction of new roads in ROW areas would likely decrease, thereby decreasing demand for salable minerals needed for construction and maintenance.  No additional lands would be closed to the disposition of salable minerals or managed as ROW exclusion area.  Impacts from RDFs placed on solid minerals would be the same as Alternative B.

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		operations to minimize surface disturbance; limit construction; maximize reclamation efforts to meet GRSG habitat needs; and place other standards and restrictions on solid mineral operations.	Alternative C, the impacts of applying these RDFs would increase.	
<b>20.</b>	<b>COMPREHENSIVE TRAVEL AND TRANSPORTATION MANAGEMENT</b>			
21.	Existing travel opportunities for motorized travel would be maintained and there would be no impact on travel management.	Impacts on travel would be slightly greater than Alternative A because future enhancements to the route network would be limited.	Prohibiting new road construction within 4 miles of active GRSG leks would result in the closure of 274,435 acres (79% of the decision area) to new road construction. This action, along with limitations on route enhancements in PH and GH, would result in site-specific loss of access and diminished route network quality.	Impacts on travel under Alternative D would be similar to Alternative B. During route designation and travel planning, management would minimize impacts on travel and transportation management.
<b>22.</b>	<b>RECREATION</b>			
23.	The planning area would be closed to cross-country motorized travel; therefore, limiting recreational OHV use to existing routes.	Impacts from CTTM would be slightly greater than Alternative A because future enhancements to the route network and impact motorized travel would be limited.	Limitations on new road construction within 4 miles of active leks, along with limitations on route enhancements in PH and GH, would limit opportunities for increased recreational access.	Impacts from CTTM would be similar to Alternative B.
24.	BLM would continue to manage for dispersed recreation	Impacts from recreation management would be similar	There would be no impacts from recreation management.	Impacts would be similar to Alternative B.

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	activities. The BLM would continue to issue SRPs on a case-by-case basis.	to Alternative A, with the exception that in PH (233,219 acres) the BLM would only allow SRPs that have a neutral or beneficial effect on PH. This could result in a reduction in the number or type of recreation opportunities in PH permitted through SRPs.		
25.	Potential impacts on recreation during construction and operation of facilities in ROWs.	A long-term reduction in the amount of acres dedicated to ROWs and above-ground linear features would improve recreation opportunities.	Managing areas as ROW exclusion in PH and GH (345,560 acres), with the exception of 843 acres of unitized areas, would protect recreational opportunities in those areas and protect the desired settings in the Judith Valley Special Recreation Management Area (SRMA) and II Extensive Recreation Management Areas (ERMAs).	Designation of PH (233,219 acres) as a ROW avoidance area would benefit recreation activities in undeveloped settings. Limitations on ROW development would also preserve the existing recreation settings in each of the II ERMAs in PH.
26.	Impacts on recreation users from mineral development would include activities and disturbance related to exploration, development, and operations.	Restrictions such as timing limitations on fluid mineral development in PH (233,219 acres) and closure of all PH areas to salable mineral disposal would decrease the potential for oil and gas development	Impacts from mineral development would be similar to Alternative B, but would apply to both PH and GH (345,560 acres).	Impacts from minerals development would be similar to Alternative B.

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**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		conflicting with recreation users.		
<b>27.</b>	<b>RANGE MANAGEMENT</b>			
28.	<p>Lands would be maintained and restored to maintain healthy ecological conditions, and efforts to manage BLM-administered rangeland would be directed first to allotments not meeting rangeland health standards due to current livestock grazing.</p> <p>In general, Alternative A also has the fewest surface use restrictions that would limit range improvements and livestock management. As a result, permittees/lessees would have the greatest flexibility for management. Adjustments to grazing system, class of livestock and other lease/permit conditions would be made upon renewal of the grazing authorization as required by site specific conditions; therefore, impacts would occur at this point.</p>	<p>Additional conservation measures specific to GRSG habitat would be incorporated consistent with management and constraints.</p> <p>Completion of land health assessments during renewal of grazing permits/leases would be prioritized within PH. As a result, impacts on range management would be most likely to occur in these areas.</p> <p>Structural range improvements would be allowed in PH but costs and time to construct these structures may be increased due to GRSG conservation measure requirements; full utilization of permitted AUMs may be impacted.</p>	<p>All PH and GH would be closed to grazing, resulting in a total closure of 337,165 acres and a reduction of 69,408 AUMs of forage available for grazing. Closure of the areas to grazing has the potential to result in economic impacts on lessees/permittees. Closures would also impact the effectiveness of current seasonal grazing rotations or other management strategies that utilize both BLM-administered and private lands.</p>	<p>Impacts on grazing systems would be similar to those described in Alternative B.</p> <p>Similar to Alternative B, the BLM would prioritize completion of land health assessments in PH.</p>
29.	There is some potential for	Potential for disturbance or	Impacts on livestock grazing	Potential for disturbance or

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<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	disturbance or conflicts with livestock grazing from other resource uses, including recreational activities, ROW development (limited disturbance in 9,708 acres of ROW avoidance area) and mineral development (45,012 acres open to grazing and fluid mineral development).	conflicts with livestock grazing from other resource uses would be reduced in this alternative as compared to Alternative A, including recreational activities, fire, ROW development (limited disturbance in 106,508 acres of ROW avoidance areas and 230,501 of ROW exclusion areas) and mineral development (29,778 acres of existing fluid mineral development leases are open to livestock grazing in PH, 33% less than Alternative A).	from various resources and resource uses would be limited due to the closure of PH and GH to grazing. Impacts on grazing in areas outside of PH and GH could be increased should grazing or development increase in intensity in these areas.	conflicts with livestock grazing from other resource uses would be similar to Alternative B, including recreational activities, fire, ROW development (240,087 acres would be proposed as a ROW avoidance area within area open to livestock grazing in PH or GH) and the same as Alternative B for mineral development.
<b>30.</b>	<b>AREAS OF CRITICAL ENVIRONMENTAL CONCERN</b>			
31.	Impacts on values of the existing Acid Shale-Pine Forest ACEC would continue from authorized land uses, including grazing, recreation, and motorized use. Managing the ACEC as ROW avoidance area would protect the relevant and important values.	Impacts would be the same as Alternative A.	Management for the Acid Shale-Pine Forest ACEC would continue to be tailored to protect the relevant and important values for which the ACEC was originally designated.  Establishing a GRSG ACEC would provide restrictions on authorized land uses within the new ACEC.	Impacts would be the same as Alternative B.
<b>32.</b>	<b>AIR QUALITY</b>			
33.	No changes to visibility and human health would occur.	Fires would be less likely to occur, resulting in fewer	Impacts from fire and fuels management would be the same	Impacts would be similar to those described under

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		impacts on air resources, including visibility and human health, compared with Alternative A.	as described under Alternative B, except restrictions on both resource use and fuels treatment options would be applied to PH and GH.	Alternative B. Placing an emphasis on improving habitat may reduce the risk of significant wildfires, resulting in fewer impacts on air resources, including visibility and human health.
34.	No changes to criteria air pollutant or hazardous air pollutant emissions would occur.	Closing areas with 279,097 acres of solid mineral potential to development would have the potential to result in fewer impacts on air resources, including visibility and human health.	Closing 453,969 acres to salable material disposal and nonenergy solid mineral leasing would have the potential to result in fewer impacts on air resources, including visibility and human health.	Impacts from solid minerals would be the same as Alternative A.
35.	<b>CLIMATE</b>			
36.	No changes to greenhouse gas (GHG) emissions would occur.	Fires would be less likely to occur, resulting in fewer GHG emissions, because management actions would decrease the risk of human-caused ignitions and increase the level of fire suppression in PH (233,219 acres).	Impacts from fire and fuels management would be the same as described under Alternative B, except restrictions on both resource use and fuels treatment options would be applied to PH and GH (345,560 acres).	Impacts would be similar to those described under Alternative B. Placing an emphasis on improving habitat may reduce the risk of significant wildfires, resulting in fewer GHG emissions.
37.	No changes to GHG emissions would occur.	Closing areas with 279,097 acres of solid mineral potential to development would have the potential to result in fewer releases of GHGs.	Closing 453,969 acres to salable material disposal and nonenergy solid mineral leasing would have the potential to result in fewer emissions of GHGs.	Impacts from solid minerals would be the same as Alternative A.

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**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
<b>38.</b>	<b>SOIL RESOURCES</b>			
39.	Motorized use of existing roads and trails would result in the potential for disturbance and compaction of soils.	Some reduction in routes and limitations on new routes, as well as upgrades to existing routes, could result in the potential for reduction of disturbance and compaction of soils in PH (233,219 acres).	Impacts on soil resources would be similar to Alternative B, although impacts would be further reduced since protections would apply to both PH and GH (345,560 acres) and the BLM would apply additional mitigation requirements.	Impacts on soil resources from travel would be similar to Alternative B.
40.	Soil conditions could continue to be degraded where land use authorizations were approved.	Managing 233,219 acres as ROW exclusion areas and 122,341 acres as ROW avoidance areas would reduce impacts on soil resources from surface disturbing activities related to ROW development.	Managing 345,560 acres as ROW exclusion areas would reduce impacts on soil resources from surface disturbing activities related to ROW development.	Managing 233,219 acres as ROW avoidance areas would reduce impacts on soil resources from surface disturbing activities related to ROW development.
41.	Grazing would continue to alter vegetative and biological soil crust communities.	Impacts from grazing would be similar to Alternative A with the addition of GRSG habitat objectives and management considerations incorporated into all BLM AMPs within PH (233.219 acres), and the option of voluntary retirement of permitted grazing uses in PH, which could further reduce soil compaction, soil erosion, and vegetation loss.	Removal of grazing in PH and GH (345,560 acres) would provide the potential for soil health to improve in areas where Rangeland Health Standards are not met due to current livestock grazing.	Additional incorporation of GRSG habitat objectives into all AMPs, and the addition of GRSG management considerations into AMPs of allotments on PH (233,219 acres), along with improving GH (112,341 acres) habitats for GRSG could improve soil conditions in these areas.

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**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
42.	Impacts on soils associated with development of existing fluid mineral leases would continue.	RDFs and conservation measures applied as COAs on existing leases in PH (233, 219 acres) would include surface use restrictions on existing federal leases, which would protect portions of the decision area from the soil impacts associated with oil and gas exploration, development, and production.	RDFs and conservation measures applied as COAs on existing fluid mineral leases in PH and GH (345,560 acres), which would protect more areas from the soil impacts.	RDFs and conservation measures applied as COAs on existing leases in PH and GH (345,560 acres) which would protect more areas from the soil impacts.
43.	Impacts on soils associated with development of solid minerals would continue.	Impacts on soil resources from solid mineral development would be less than Alternative A with 279,097 acres closed to mineral entry. RDFs and BMPs would place limitations on road design, construction, and use; restrict operations to minimize surface disturbance.	Impacts from solid minerals would be the least of all the alternatives with all GRSG habitat areas (345,560 acres) managed as closed to mineral entry. Salable mineral pits within PH (233,219, acres) would be restored, which would increase soil health more than Alternative A. RDFs and BMPs would place limitations on road design, construction, and use; restrict operations to minimize surface disturbance.	Impacts on soil resources from solid mineral development would be less than Alternative A with 453,969 acres closed to mineral entry. RDFs and BMPs would place limitations on road design, construction, and use; restrict operations to minimize surface disturbance.
44.	<b>WATER RESOURCES</b>			
45.	Impacts from human-made runoff of soils and chemicals into waterways would continue as a result of ROW	Impacts from human-made runoff of soils and chemicals into waterways would be less than Alternative A with 233,219 acres (PH) managed as ROW	Impacts from human-made runoff of soils and chemicals into waterways from ROW development would be the least of all the alternatives with PH	Impacts from ROW development would be similar to Alternative A.

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<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	development.	exclusion areas.	and GH (345,560 acres) managed as ROW exclusion area.	
46.	The BLM would continue to maintain the PFC of riparian and wetland areas. Water sources would be developed where needed (as indicated by monitoring) to improve GRSG habitat. Waters used by GRSG that are adversely affected by uncontrolled livestock use would be fenced.	Incorporating GRSG habitat objectives and management considerations into livestock grazing management could reduce, but would not eliminate, impacts from grazing on water resources. Impacts would be similar to Alternative A.	Reduced grazing AUMs could increase the potential for cleaner surface flows into waterways and improve access to water sources.	Impacts would be similar to Alternative A but additional range improvements in PH could improve water resources.
47.	Impacts from human-made runoff of soils and chemicals into waterways associated with development of existing fluid mineral leases would continue.	Impacts from fluid mineral development would be less than Alternative A. All existing leases on federal oil and gas estate in PH (233,219 acres) would be subject to RDFs applied as COAs.	Impacts from fluid mineral development would be the least of all the alternatives. All existing leases on federal oil and gas estate in PH and GH (345,560 acres) would be subject to RDFs applied as COAs.	Impacts from implementing RDFs as COAs in PH and GH (345,560 acres) would be similar to Alternative C.
48.	Impacts on water resources associated with development of solid minerals would continue.	Impacts on water resources from solid mineral development would be less than Alternative A with 279,097 acres closed to mineral entry. RDFs and BMPs would place limitations on road design, construction, and use; restrict operations to minimize	Impacts from solid minerals would be the least of all the alternatives with PH and GH (345,560 acres) managed as closed to mineral entry. Salable mineral pits within PH (233,219 acres) would be restored, which would increase soil health more	Impacts on water resources from solid mineral development would be less than Alternative A with 453,969 acres closed to mineral entry. RDFs and BMPs would place limitations on road design, construction, and use;

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<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		surface disturbance.	than Alternative A. RDFs and BMPs would place limitations on road design, construction, and use; restrict operations to minimize surface disturbance.	restrict operations to minimize surface disturbance.
<b>49.</b>	<b>SPECIAL STATUS SPECIES – OTHER SPECIES OF ISSUE</b>			
50.	Travel may result in human disturbance, degradation of habitat, or mortality of special status species.	Route construction in PH (233,219 acres) would be limited to realignments of existing roads, or built or upgraded to minimum standards necessary, which would reduce impacts from disturbance, changes to habitat, and mortality on special status species in these areas.	Additional restrictions on new road construction in PH and GH (345,560 acres) would reduce impacts from disturbance, changes to habitat, and mortality on special status species in these areas.	Impacts from travel would be similar to Alternative B, with increased management flexibility incorporated to improve management and target those areas that need most protection.
51.	9,708 acres of habitat would continue to be managed as ROW avoidance area which would protect special status species from human-related disturbance and habitat alteration.	ROW exclusion areas in PH (233,219 acres) would preclude future impacts from human disturbance and infrastructure in these areas. Additionally, ROW avoidance areas (112,341 acres) in GH would further reduce these impacts. However, due to the large aerial extent and variety of ownerships (non-BLM) within PH (974,735 acres) and GH (899,659 acres), impacts on special status species would still continue to occur.	ROW exclusion areas in PH and GH (345,560 acres) would preclude future impacts from human disturbance and infrastructure in these areas. Potential indirect impacts on special status species from developing on private lands.	ROW avoidance areas in PH (233,219 acres) would reduce future impacts from human disturbance and infrastructure from development in these areas. Impacts from ROW development in GH (112,341 acres) would be mitigated.

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<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		Potential indirect impacts on special status species from developing on private lands.		
52.	Livestock grazing practices could have negative, neutral or positive effects to special status species through development and monitoring of AMPs or similar grazing plans. Grazing systems would consider restricting livestock from riparian areas which would decrease impacts on riparian vegetation health and therefore increase the availability of wildlife special status species.	Incorporating GRSG habitat objectives and management considerations into livestock grazing management would reduce, but would not eliminate, impacts from grazing on vegetation communities. These efforts would also promote the health of potential habitats, including sagebrush steppe, riparian areas, and wet meadows.	Grazing would be removed from 337,165 acres of grazing lands, which would include the removal of 69,408 AUMs. This action would likely reduce the impacts on special status species from grazing. However, removal of grazing could allow for noxious weeds to spread and fuels to accumulate leading to an increase in wildfire risk. Also, these actions could further fragment the landscape with mixed land practices and water uses.	If an effective grazing system meeting GRSG habitat objectives is not in place, the permit renewal process would examine at least one alternative to restore this habitat. This could benefit special status species which occupy GRSG habitat.
53.	Fluid mineral development of existing leases would continue to cause impacts on special status species related to surface disturbance and occupancy.	Applying RDFs as COAs to existing leases in PH (233,219 acres) would reduce impacts on special status species and their habitats from activities related to surface disturbance and occupancy.	Impacts from fluid minerals would be similar to Alternative B except that COAs would be applied to existing leases in both PH and GH (345,560 acres).	Impacts from fluid minerals would be the same as Alternative B.
54.	<b>WILDLIFE</b>			
55.	Travel may result in human disturbance, degradation of habitat, or mortality of wildlife.	Route construction in PH would be limited to realignments of existing roads, or built or	Additional restrictions on new road construction in PH and GH (345,560 acres) would	Impacts from travel would be similar to Alternative B, with increased management

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<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
		upgraded to minimum standards necessary, which would reduce impacts from disturbance, changes to habitat, and mortality on wildlife in these areas.	reduce impacts from disturbance, changes to habitat, and mortality on wildlife in these areas.	flexibility incorporated to improve management and target those areas that need most protection.
56.	9,708 acres of habitat would continue to be managed as ROW avoidance area which would protect wildlife from human-related disturbance and habitat alteration.	ROW exclusion areas in PH (233,219 acres) would preclude future impacts from human disturbance and infrastructure in these areas. Additionally, ROW avoidance areas (112,341 acres) would be included for GH, further reducing these impacts. However, due to the large aerial extent and variety of ownerships (non-BLM) within PH (974,735 acres) and GH (899,659 acres), impacts on wildlife would still continue to occur. Potential indirect impacts on wildlife from developing on private lands.	ROW exclusion areas in PH and GH (345,560 acres) would preclude future impacts from human disturbance and infrastructure in these areas. Potential indirect impacts on wildlife from developing on private lands.	ROW avoidance areas in PH (233,219 acres) would reduce future impacts from human disturbance and infrastructure from development in these areas. Impacts from ROW development in GH (112,341 acres) would be mitigated.
57.	Livestock grazing practices could have negative, neutral or positive effects to wildlife through development and monitoring of AMPs or similar grazing plans. Grazing systems would consider restricting	Incorporating GRSG habitat objectives and management considerations into livestock grazing management would reduce, but would not eliminate, impacts from grazing on vegetation communities.	Grazing would be removed from 337,165 acres of grazing lands, which would include the removal of 69,408 AUMs. This action would likely reduce the impacts on wildlife from grazing. However, removal of grazing	If an effective grazing system meeting GRSG habitat objectives is not in place, the permit renewal process would examine at least one alternative to restore this habitat. This could benefit

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	livestock from riparian areas which would decrease impacts on riparian vegetation health and therefore increase the availability of wildlife habitat.	These efforts would also promote the health of potential habitats, including sagebrush steppe, riparian areas, and wet meadows.	could allow for noxious weeds to spread and fuels to accumulate leading to an increase in wildfire risk. Also, these actions could further fragment the landscape with mixed land practices and water uses.	wildlife which occupy GRSG habitat.
58.	Fluid mineral development of existing leases would continue to cause impacts on wildlife related to surface disturbance and occupancy.	Applying RDFs as COAs to existing leases in PH (233,219 acres) would reduce impacts on wildlife and their habitats from activities related to surface disturbance and occupancy.	Impacts from fluid minerals would be similar to Alternative B except that COAs would be applied to existing leases in both PH and GH (345,560 acres).	Impacts from fluid minerals would be the same as Alternative B.
59.	<b>RENEWABLE ENERGY</b>			
60.	Zero acres of lands with “Good” or better wind potential would be affected by ROW exclusion or avoidance areas. All lands with such potential would continue to be open for ROW applications on a case-by-case basis.	70% of lands with “Good” or better wind potential that are open for ROW applications under Alternative A would become ROW exclusion areas under Alternative B and would be closed.  5,595 fewer acres available for wind development without substantial restrictions. 9% of lands with “Good” or better wind potential available for ROW applications within the decision area would be subject	79% of lands with “Good” or better wind potential that are open for ROW applications under Alternative A would become ROW exclusion areas and would be closed.	79% of lands with “Good” or better wind potential that are open for ROW applications under Alternative A would become ROW avoidance areas and would be subject to substantial restrictions compared to Alternative A.

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

Line #	Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Agency Preferred)
		to substantial restrictions when compared with Alternative A.		
61.	<b>SOCIAL AND ECONOMIC CONDITIONS</b>			
62.	<p>Use of allocated forage on allotments in the planning area would generate an estimated 201 total jobs (direct, indirect, and induced) and \$2.8 million in labor income (direct, indirect, and induced) in the five county economic impact areas, which includes Chouteau, Fergus, Judith, Meagher and Petroleum counties. This figure includes direct contributions of 128 jobs, which equates to about 29% of employment in the agricultural economic sector for the area.</p> <p>Land use authorizations would continue to support area communities and economies.</p> <p>Economic contributions from recreation would continue at current levels; approximately 8 jobs (direct, indirect, and induced) are associated with wildlife related recreation, and 12 jobs (direct, indirect, and induced) are associated with</p>	<p>It is anticipated that current economic contributions from allocated grazing on allotments covered under this RMPA would continue as described under Alternative A. Reductions in allotted grazing could, however, occur with voluntary retirement of allotments which would reduce economic contributions.</p> <p>This alternative may limit new ROWs or energy development within the planning area (233,219 acres or 39% of the decision area would be designated as exclusion areas for new ROW permits) and would consequently support communities and economies less than under Alternative A.</p> <p>If future SRP applications were denied (if not found to be neutral or beneficial to GRSG), there would be a less organized hunting opportunities on BLM-</p>	<p>As a result of the reductions in allocated forage, estimated employment decrease from 201 to 66 total jobs (direct, indirect, and induced) and labor income would decrease from \$2.8 million to \$931,000 (direct, indirect, and induced) on an average annual basis within the impact area economy. This estimate includes a direct employment decrease from 128 jobs to 42 jobs, which would correspond to a decrease from 29% to 10% of employment in this sector. Decreases may not be as large predicted since actual use of allotments used in analysis of current conditions is below the permitted level of use. In addition, the decrease portrayed here could be less if alternative sources of forage is found for willing permittees.</p> <p>This alternative may limit new ROWs or energy development within the planning area</p>	<p>It is anticipated that current economic contributions from allocated grazing on allotments covered under this RMPA would continue as described under Alternative A.</p> <p>Impacts from new ROWs or energy development within the planning area would be as described in Alternative B.</p> <p>Impacts on recreation would be the same as discussed under Alternative B.</p> <p>Restoration projects associated with threatened and endangered species would be considered when prioritizing projects. As a result, well-being and non-market values associated with GRSG habitat would be less than Alternatives B and C. Due to uncertainty in how restoration projects are prioritized; a relative comparison to Alternative A cannot be made.</p>

**Table 2-6**  
**Summary of Environmental Consequences of Alternatives A, B, C, and D<sup>1</sup>**

<b>Line #</b>	<b>Alternative A (No Action)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D (Agency Preferred)</b>
	<p>non-wildlife related recreation in the five-county impact area; approximately 1% of employment in sectors specifically attributable to tourism and recreation.</p> <p>Well-being and non-market values associated with GRSG habitat would continue at current levels, but are likely to be less than that of action alternatives.</p>	<p>administered land in the decision area as compared with Alternative A. As a result economic contributions could be less than current contributions depicted under Alternative A.</p> <p>As a result of protective measures for GRSG habitat, well-being non-market values associated with GRSG habitat would be protected to a greater degree than Alternative A.</p>	<p>(345,560 acres of the decision area would be designated as exclusion for new ROW permits) and would consequently provide less support to communities and economies than under Alternative A.</p> <p>If changes to recreation access occurred, there would be a reduction in recreation visitation on BLM-administered land in the decision area. As a result, economic contributions could be less than Alternative A.</p> <p>Policies would promote expansion of GRSG habitat. As a result, well-being and non-market values associated with GRSG habitat would be protected to a greater degree than the other alternatives.</p>	
<b>63.</b>	<b>ENVIRONMENTAL JUSTICE</b>			
<b>64.</b>	While minority and low-income populations may exist in the area, the alternatives are not expected to have a disproportionately high and adverse human health or environmental effects on these communities. Impacts on local communities are expected to be negligible, and there is no reason to suspect that any impacts would disproportionately affect minority and low income populations.			

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**CHAPTER 3**  
**AFFECTED ENVIRONMENT**



# CHAPTER 3

## AFFECTED ENVIRONMENT

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### 3.1 INTRODUCTION

This chapter documents the existing conditions and trends of resources in the planning area that may be affected by implementing any of the proposed alternatives described in **Chapter 2**. The affected environment provides the context for assessing potential impacts as described in **Chapter 4**.

The planning area for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS is composed of BLM; Forest Service; USFWS; US Department of Defense; State of Montana; and private lands (refer to **Table I-1**) in Chouteau, Fergus, Judith Basin, Meagher, and Petroleum Counties in central Montana. A map of the planning area is provided as **Figure I-1** in **Appendix A**.

Though the planning area includes private lands, decisions are only made for BLM federal surface and federal minerals in this RMPA. Management direction and actions outlined in this EIS apply only to these BLM-administered lands in the planning area and to federal mineral estate under BLM jurisdiction that may lie beneath other surface ownership.

### 3.2 ORGANIZATION OF CHAPTER 3

This chapter contains sections describing the biological, physical, and human resources of the planning area affected by implementing the alternatives outlined in this EIS. The following critical elements of the human environment and resource programs are not present; do not have specific GRSG conservation goals, objectives, or management actions identified in the alternatives; or are not directly affected by the alternatives presented in this EIS:

- Visual Resources
- Cultural Resources
- Paleontological Resources

- Tribal Interests
- National Historic Trails
- Wild and Scenic Rivers

Implementation of any of the alternatives would result in general and unquantifiable indirect beneficial effects for the above resource programs in terms of greater protection through new restrictions on surface and resource use resulting in reduced opportunities for surface disturbance or habitat disruption where they exist. For further information on the affected environment of these resources and programs, please refer to the Affected Environment sections of the Judith Resource Area Resource Management Plan and the Headwaters Resource Management Plan being amended by this Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

The following critical elements of the human environment and resources are specifically addressed in **Chapter 3** and **Chapter 4** of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

- Greater Sage-Grouse
- Lands and Realty
- Vegetation (Including Noxious Weeds; Riparian and Wetlands)
- Wildland Fire Management and Ecology
- Fluid Minerals
- Solid Leasable Minerals
- Locatable Minerals
- Salable Minerals
- Comprehensive Travel and Transportation Management
- Recreation
- Range Management
- Areas of Critical Environmental Concern
- Air Resources
- Climate
- Soil Resources
- Water Resources
- Special Status Species – Other Species of Issue
- Fish and Wildlife
- Renewable Energy

- Social and Economic Conditions
- Environmental Justice

Each of the above resource sections in this chapter contains a discussion of existing conditions and trends:

- Existing conditions describe the location, extent, and current condition of the resource in the planning area in general and on BLM-administered lands. Conditions for a resource can vary, depending on the resource. For each resource, a general description of the existing conditions is provided for the planning area, regardless of land status. This is done to provide a regional context for the resource. Then, a more detailed description of the existing conditions is provided for the BLM-administered lands managed according to the Judith Resource Area Resource Management Plan and the Headwaters Resource Management Plan. This is done to provide an area-specific description of the existing conditions for the resource. When possible, greater emphasis is placed on describing the existing conditions of the resource as it pertains to GRSG and their habitat.
- Trends identify the degree and direction of resource change between the present and some point in the past. If there is change, the degree and direction of resource change is characterized as moving toward or away from the current desired condition based on the indicators, and the reasons for the change are identified. Trends can also be described in quantitative or qualitative terms. Identifying the trends is done to provide an understanding of how BLM management influences the desired condition of the resource over time. It can be difficult to analyze trends for certain resources, because changes to the resource often occur due to factors beyond the control of the BLM.

The BLM reviewed the Judith Resource Area Resource Management Plan, the Headwaters Resource Management Plan, and other relevant information sources (such as maps and state GRSG conservation assessments) for existing conditions and trends for the resources listed above with respect to GRSG and their habitat. This affected environment information is summarized below and, where appropriate, noted when the information is incorporated by reference.

Data from GIS have been used in developing acreage calculations and for generating many of the figures. Calculations in this EIS are rounded and are dependent upon the quality and availability of data. Data were collected from a variety of sources, including the BLM, collaborative partners, stakeholders, and cooperating agencies. Given the scale of the analysis, the compatibility constraints between datasets, and the lack of data for some resources, all calculations are approximate and serve for comparison and analytic purposes

only. Likewise, the figures are provided for illustrative purposes and subject to the limitations discussed above. The BLM may receive additional GIS data; therefore, the acreages may be recalculated and revised at a later date.

### 3.2.1 WAFWA Management Zone Data

To augment this planning document at a biologically meaningful scale for GRSG, a BER of GRSG was produced by USGS for the BLM (Manier et. al. 2013). The BER is a science support document that provides information to put planning units and issues into the context of the larger WAFWA Sage-Grouse management zones. The BER examines each threat identified in the USFWS's listing decision published on March 15, 2010. For each threat, the report summarizes the current scientific understanding of various impacts on GRSG populations and habitats. When available, patterns, thresholds, indicators, metrics, and measured responses that quantify the impacts of each specific threat are reported.

As described in **Chapter 1**, the planning area for the Lewistown Field Office Greater Sage-Grouse RMPA/EIS is located in WAFWA MZs I and IV (Stiver et al. 2006). Data from the BER are presented throughout this chapter to illuminate the location (e.g., PPH and PGH), magnitude, and extent of the threats within WAFWA MZs I and IV that comprises the planning area. Because the BER focuses on threats to GRSG at the WAFWA management zone scale, it provides biologically meaningful data for larger scale analyses. The BER data provided in **Chapter 3** is considered in the WAFWA MZs I and IV cumulative effects analysis for GRSG in **Chapter 5, Cumulative Impacts**.

The data and information included from the BER was the most accurate available when the data was "frozen" in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

**Chapter 3** also presents data that is available at a finer scale than used in the BER. These fine-scale, local data are incorporated into the affected environment discussion to complement the BER's biologically meaningful data, characterize the relative contributions of threats in the planning area as opposed to the WAFWA management zones, and to set the stage for the cumulative effects analysis for GRSG.

## 3.3 GREATER SAGE-GROUSE

Special status species are those species with populations that have declined to the point of substantial federal or state agency concern. These declines may

result from habitat loss or modification, or from changes in competition, predation, disease, weather, or overharvest. Habitat loss and modification from human activities are the primary causes of declining populations, particularly for species that are highly adapted to specific ecological niches. Such species may or may not be legally protected by federal or state agencies.

The BLM's policy for special status species is to: 1) conserve and/or recover threatened and endangered species and the ecosystems on which they depend so that ESA protections are no longer needed, and 2) to initiate proactive conservation measures that reduce or eliminate threats to BLM-sensitive species to minimize the likelihood of and need for listing of these species under the ESA. The BLM 6840 Manual, Special Status Species Management (BLM 2008c), sets policy for the management of candidate species and their habitat. Candidate species are considered BLM-sensitive species. The 6840 manual directs the BLM to conserve special status species and the ecosystems on which they depend on BLM-administered land, and reduce the likelihood and need for future listing under the ESA. The 6840 manual directs the BLM to undertake conservation actions for such species before listing is warranted and also to "work cooperatively with other agencies, organizations, governments, and interested parties for the conservation of sensitive species and their habitats to meet agreed on species and habitat management goals."

Policy provided in the 6840 manual requires that when the BLM engages in the planning process, land use plans, and implementation plans, that strategies, restrictions, and management actions necessary to conserve and recover listed species, as well as provisions for the conservation of BLM-sensitive species, are identified. This policy also requires managers to determine to the extent practicable, the distribution, abundance, population condition, current threats, and habitat needs for sensitive species, and evaluate the significance of actions in conserving those species.

Historically, GRSG occurred in parts of 12 states within the western US and three Canadian provinces; populations have declined throughout much of their former range and have been extirpated from fringe areas. Across their range, GRSG currently occupy 56 percent, of their potential pre-settlement range, approximately 1,200,000 km<sup>2</sup> (Schroeder et al. 2004).

The COT, a USFWS team of federal and state wildlife officials was tasked with developing conservation objectives by defining the degree to which the threats need to be ameliorated to conserve the GRSG, so that it no longer is warranted for listing under the ESA. The Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report (COT Report; USFWS 2013) was developed by this team. The report discusses GRSG populations and sub-populations within each WAFWA management zone and describes the threats facing each population. The LFO is primarily located within WAFWA MZ I, in the northwest portion of the Yellowstone Watershed Population. MZ I (the

Great Plains) also includes the Dakotas, northern Montana and the Powder River basin. A small amount of the LFO also occurs in the Belt Mountains Population in WAFWA MZ IV. The report was used to focus the analysis in **Chapter 4** on the threats most likely to impact GRSG in the planning area.

The majority of the GRSG population in the planning area is part of the Yellowstone Watershed Population, a large population covering an expansive area south of the Missouri River, making up the majority of GRSG habitats in southeast and south-central Montana. Refer to **Table 2-1** for a list of threats from the COT report applicable to the Yellowstone Watershed Population. The known threats to the Yellowstone Watershed Population that are present and widespread include agriculture conversion, weeds and annual grasses, energy, infrastructure, and grazing. Threats that are present but localized in the Yellowstone Watershed Population include elimination of sagebrush, fire, conifers, and recreation (USFWS 2013, Table 2, p. 17). Garton et al. (2011) reported a minimum male count of over 2,900 males, and considered the population only potentially at risk. Land ownership in the LFO is predominantly private with scattered tracts and blocks of public land. Livestock grazing and small grain farming are common, with scattered oil and gas developments across portions of this area. Extensive private lands have the potential for conversion of additional sagebrush habitats to farming, and cropland conversion continues to take place (USFWS 2013, p. 65).

The Belt Mountains Population inhabits 439 acres of BLM-administered lands in the planning area. This population is at high risk because it is isolated from other GRSG populations by 50 miles in all directions, and fewer than 100 males have been counted annually since 1984. Refer to **Table 2-2** for a list of threats from the COT report applicable to the Belt Mountains Population. The known threats to the Belt Mountains Population that are present and widespread include isolated/small size population, agriculture conversion, weeds/annual grasses, and grazing. Threats that are present but localized in the Belt Mountains Population include sagebrush elimination, fire, conifers, energy, infrastructure, recreation, and urbanization (USFWS 2013, pp.77-78).

In response to petitions, USFWS first evaluated GRSG for listing in 2005 and determined listing was not warranted. After a 2007 court order, the agency again considered the GRSG for listing and, in 2010, concluded that GRSG listing under the ESA was warranted range-wide but precluded by higher priority actions (USFWS 2010a, p.1).

The BER was produced by USGS, in cooperation with the BLM, to summarize the science, activities, programs, and policies influencing conservation of GRSG across their range (Manier et al. 2013). It summarizes the available primary literature on each of the threats and their impact on GRSG and provides tables of the overlap of threats, such as oil and gas leases with GRSG primary and general habitat.

The GRSG National Technical Team was established by the BLM to coordinate effective management actions based on best available science for GRSG conservation and restoration. The NTT Conservation Measures/Planning Strategy Report (December 2011) includes a discussion of threats and recommended BLM management actions for each.

### 3.3.1 Conditions of the Planning Area

#### **Availability of Sagebrush Habitat (Broad- and Mid-Scale Indicator)**

The distribution of GRSG is closely aligned with the distribution of sagebrush-dominated landscapes (Schroeder et al. 2004). GRSG require large, intact, and connected expanses of sagebrush shrubland to exist (Aldridge et al. 2008; Wisdom et al. 2011). The planning area occurs in WAFWA MZs I and IV (Stiver et al. 2006).

IM No. 2012-044 (BLM 2011a) directs the BLM to collaborate with state wildlife agencies to identify and map two categories of GRSG habitat:

- **PPH:** 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
- **PGH:** Areas of occupied seasonal or year-round habitat outside of priority habitat

In Montana, the BLM developed its PPH/PGH map (**Figure 3-1**, Greater Sage-Grouse Habitat, in **Appendix A**) based on data from MFWP. GRSG core areas are habitat associated with Montana's highest densities of GRSG (25 percent quartile), based on male counts, and GRSG lek complexes and associated habitat important to GRSG distribution. Acres of PPH and PGH within the planning area are presented in **Table 3-1**, PPH and PGH Occurring on BLM-Administered Lands and Non-BLM Lands in the Planning Area.

**Table 3-1**  
**PPH and PGH Occurring on BLM-Administered Lands and Non-BLM Lands in the Planning Area**

<b>Lands</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>	<b>Outside GRSG Habitat (acres)</b>
BLM-administered lands	233,219 (19%)	112,341 (11%)	248,435 (4%)
Non-BLM-administered lands	974,775 (81%)	902,694 (89%)	6,717,524 (96%)
<b>Total Planning Area</b>	<b>1,207,994</b>	<b>1,015,035</b>	<b>6,965,959</b>

Source: BLM 2012a

**Table 3-2**, Acres of PPH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-Administered Lands in the Lewistown Field Office, and **Table 3-3**, Acres of PGH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-administered Lands within the Lewistown Field Office, shows the Regional Gap Analysis Program (ReGAP) Tier III vegetation types for the LFO in PPH and PGH habitat. Sagebrush habitat in PPH on BLM-administered land in PPH covers 169,598 acres. Mixed-grass prairie, riparian and pine woodland are the next most common habitat types. In PGH, sagebrush in BLM-administered land covers 44,698 acres. **Table 3-3** includes habitat in both MZ I and MZ IV (Belt Mountains); the Belt Mountain population area is only 439 acres, and no PPH is found in this area. Population areas are described in more detail below.

Leks are key spring activity areas for mating and are most often located in open areas surrounded by sagebrush cover. There are approximately 148 leks within the planning area, 77 of which were active in 2013. The greatest concentration of PPH is in the eastern portion of the planning area in Fergus and Petroleum counties. Smaller patches of PGH occur in the western portion of the planning area. See **Figure 3-2**, Greater Sage-Grouse Breeding Density, in **Appendix A**.

#### ***Connectivity of Habitat Patches (Mid-Scale Indicator)***

While the amount of habitat available to GRSG is very important, habitat pattern is just as critical to long-term survival of the species. Fragmentation of habitat into smaller patches can result in extirpation of local GRSG populations when functional connectivity among patches is lost. Leks separated by distances greater than 11 miles could be isolated due to decreased probability of dispersals from neighboring leks (Connelly et al. 2000). Isolation and reduced connectivity increases the probability of loss of genetic diversity and extirpation from random events (Knick and Hanser 2011).

There is little information available regarding minimum sagebrush patch sizes required to support populations of GRSG. This is due in part to the migratory nature of some but not all GRSG populations, the lack of juxtaposition of seasonal habitats, and differences in local, regional, and range-wide ecological conditions that influence the distribution of sagebrush and associated understories. Where home ranges have been reported, they are extremely variable (2.5 to 382 square miles; Connelly et al. 2011a).

GRSG populations may be nonmigratory or migratory, moving between or among seasonal use areas (Connelly et al. 2011a). Recent research has shown that GRSG near Glasgow, Montana, migrate up to 150 miles between seasonal habitats, making frequent stopovers in suitable sagebrush rangelands (Smith 2013). There is no indication or expectation that GRSG in the planning area may be similarly migratory.

**Table 3-2  
Acres of PPH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-Administered Lands in the Lewistown Field Office**

<b>PPH Vegetation Description</b>	<b>BLM</b>	<b>Private</b>	<b>State</b>	<b>Other</b>	<b>Total</b>
Cultivated Cropland	2,301	68,536	1,357	184	<b>72,378</b>
Developed, Low Intensity	114	1,743	109	6	<b>1,972</b>
Developed, Medium Intensity	0	3	0	0	<b>3</b>
Developed, Open Space	173	2,716	188	2	<b>3,079</b>
Inter-Mountain Basins Big Sagebrush Steppe	169,598	463,132	57,751	2,226	<b>692,707</b>
Inter-Mountain Basins Greasewood Flat	2,345	5,786	640	87	<b>8,858</b>
Introduced Upland Vegetation - Perennial Grassland and Forbland	4,807	114,626	4,571	112	<b>124,116</b>
North American Arid West Emergent Marsh	200	499	34	622	<b>1,355</b>
Northern Rocky Mountain Foothill Conifer Wooded Steppe	3,415	9,642	905	72	<b>14,034</b>
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	23	0	0	<b>23</b>
Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland	99	0	0	0	<b>99</b>
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	0	12,333	1,552	0	<b>13,885</b>
Northwestern Great Plains - Black Hills Ponderosa Pine Woodland and Savanna	6,551	0	0	118	<b>6,669</b>
Northwestern Great Plains Floodplain	16	76	0	0	<b>92</b>
Northwestern Great Plains Mixedgrass Prairie	30,839	134,166	15,930	723	<b>181,658</b>
Northwestern Great Plains Riparian	6,301	38,134	3,975	150	<b>48,560</b>
Northwestern Great Plains Shrubland	75	378	31	0	<b>484</b>
Open Water (Fresh)	203	1,085	77	4	<b>1,369</b>
Pasture/Hay	4	728	11	0	<b>743</b>
Rocky Mountain Cliff, Canyon and Massive Bedrock	5	0	0	0	<b>5</b>
Western Great Plains Badland	2,793	4,259	709	18	<b>7,779</b>
Western Great Plains Cliff and Outcrop	41	14	0	3	<b>58</b>
Western Great Plains Closed Depression Wetland	18	94	7	4	<b>123</b>
Western Great Plains Open Freshwater Depression Wetland	43	53	1	0	<b>97</b>
Western Great Plains Saline Depression Wetland	375	1,157	95	1,668	<b>3,295</b>
Western Great Plains Sand Prairie	2,548	17,125	2,480	0	<b>22,153</b>
Western Great Plains Wooded Draw and Ravine	355	1,847	164	17	<b>2,383</b>
<b>Total</b>	<b>233,219</b>	<b>878,155</b>	<b>90,587</b>	<b>6,016</b>	<b>1,207,977</b>

Source: BLM 2012a

**Table 3-3  
Acres of PGH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-administered Lands within the  
Lewistown Field Office**

<b>PGH Vegetation Description</b>	<b>BLM</b>	<b>Private</b>	<b>State</b>	<b>Other</b>	<b>Total</b>
Cultivated Cropland	1,623	87,145	2,990	12	<b>91,770</b>
Developed, Low Intensity	29	1,591	82	0	<b>1,702</b>
Developed, Medium Intensity	2	18	0	0	<b>20</b>
Developed, Open Space	69	8,406	909	3	<b>9,387</b>
Harvested Forest - Grass/Forb Regeneration	0	37	0	2	<b>39</b>
Harvested Forest - Northwestern Conifer Regeneration	0	38	0	2	<b>40</b>
Harvested forest-Shrub Regeneration	0	79	0	5	<b>84</b>
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	6	0	0	<b>6</b>
Inter-Mountain Basins Big Sagebrush Steppe	44,698	253,149	32,541	406	<b>330,794</b>
Inter-Mountain Basins Greasewood Flat	1,747	6,410	903	23	<b>9,083</b>
Inter-Mountain Basins Montane Sagebrush Steppe	135	48,875	5,178	219	<b>54,407</b>
Introduced Upland Vegetation - Perennial Grassland and Forbland	1,757	75,068	4,652	39	<b>81,516</b>
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	31	7,196	653	624	<b>8,504</b>
North American Arid West Emergent Marsh	4	246	3	8	<b>261</b>
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	26	0	0	0	<b>26</b>
Northern Rocky Mountain Foothill Conifer Wooded Steppe	9,423	19,891	1,435	0	<b>30,749</b>
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	904	121	0	<b>1,025</b>
Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland	120	31,389	9,684	25	<b>41,218</b>
Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	2	748	63	7	<b>820</b>
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	2	1,531	311	66	<b>1,910</b>
Northern Rocky Mountain Subalpine Deciduous Shrubland	0	3	2	0	<b>5</b>
Northern Rocky Mountain Subalpine-Upper Montane Grassland	0	181	5	10	<b>196</b>
Northwestern Great Plains - Black Hills Ponderosa Pine Woodland and Savanna	14,360	29,545	3,128	0	<b>47,033</b>
Northwestern Great Plains Floodplain	195	2,006	182	130	<b>2,513</b>
Northwestern Great Plains Mixedgrass Prairie	8,377	96,424	8,808	19	<b>113,628</b>
Northwestern Great Plains Riparian	1,811	26,699	1,662	0	<b>30,172</b>
Northwestern Great Plains Shrubland	1,529	4,894	361	0	<b>6,784</b>
Open Water (Fresh)	132	1,137	49	424	<b>1,742</b>
Pasture/Hay	8	25,112	579	3	<b>25,702</b>
Rocky Mountain Alpine-Montane Wet Meadow	1	1,039	112	1	<b>1,153</b>

**Table 3-3**  
**Acres of PGH within Each Vegetation Type on BLM-Administered Lands and Non-BLM-administered Lands within the Lewistown Field Office**

<b>PGH Vegetation Description</b>	<b>BLM</b>	<b>Private</b>	<b>State</b>	<b>Other</b>	<b>Total</b>
Rocky Mountain Aspen Forest and Woodland	0	427	41	18	<b>486</b>
Rocky Mountain Cliff, Canyon and Massive Bedrock	99	30	5	0	<b>134</b>
Rocky Mountain Foothill Limber Pine-Juniper Woodland	0	571	271	0	<b>842</b>
Rocky Mountain Lodgepole Pine Forest	4	845	108	105	<b>1,062</b>
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	4	5,737	350	38	<b>6,129</b>
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	1	54	5	3	<b>63</b>
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	75	1	1	<b>77</b>
Rocky Mountain Subalpine-Montane Mesic Meadow	21	23,670	1,393	93	<b>25,177</b>
Western Great Plains Badland	22,427	28,121	3,931	90	<b>54,569</b>
Western Great Plains Cliff and Outcrop	72	195	13	0	<b>280</b>
Western Great Plains Closed Depression Wetland	3	109	0	0	<b>112</b>
Western Great Plains Open Freshwater Depression Wetland	0	68	0	0	<b>68</b>
Western Great Plains Saline Depression Wetland	17	203	0	0	<b>220</b>
Western Great Plains Sand Prairie	2,992	24,084	2,696	0	<b>29,772</b>
Western Great Plains Wooded Draw and Ravine	606	2,628	182	2	<b>3,418</b>
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	0	64	24	0	<b>88</b>
<b>Total</b>	<b>112,327</b>	<b>816,648</b>	<b>83,433</b>	<b>2,378</b>	<b>1,014,786</b>

Source: BLM 2012a

**Landscape Matrix and Edge Effect (Mid-Scale Indicator)**

GRSG typically occupy sagebrush vegetation but may also use a variety of other habitats (e.g., riparian meadows, agricultural lands) intermixed in a sagebrush dominated landscape. Aldridge and Boyce (2007) found GRSG selected large expanses of sagebrush and avoided anthropogenic edge during the breeding season. Thus, the viability of fragmented habitat for GRSG is dependent upon the juxtaposition of these habitats in relation to sagebrush and the hazards to birds using these areas (Connelly et al. 2011b). In addition, studies have found a positive relationship between quality of nesting cover and nesting success (Montana Sage Grouse Work Group 2005).

In Montana, GRSG prefer breeding habitats with a sagebrush canopy over 20 percent, generally within the 6- to 12-inch height class. Most nesting is believed to occur within two miles of a lek in Montana, and GRSG exhibit high commitment to a nest-area. In the summer, GRSG broods in central Montana prefer relatively open stands of sagebrush, generally with a canopy ranging from one to 25 percent. More than half of all GRSG observations during August and September were in alfalfa fields, greasewood in bottomlands, and borrow pits where succulent forbs remained relatively abundant. Increased use of higher density sagebrush in late September or October coincided with transition to a winter diet of sagebrush (Montana Sage Grouse Work Group 2005).

Conifer invasion and invasive weed spread cause habitat fragmentation by encroaching on existing sagebrush shrublands and making habitat less suitable for GRSG. A decline of shrubs is the most documented shift in understory vegetation following conifer encroachment. Mountain big sagebrush sites show 20 to 25 percent declines in shrub cover in response to trees, reaching 50 percent of the maximum site potential (Miller et al. 2000). Tree growth also provides attractive perches for GRSG predators, which further induces GRSG to avoid these areas. In LFO, conifer encroachment is a localized threat which primarily occurs in the northeastern/eastern portion of PPH.

Crested wheatgrass (*Agropyron cristatum*) is the most prevalent introduced perennial grass in the planning area. Annual bromes, including cheatgrass (*Bromus tectorum*) and Japanese brome (*B. japonicus*), occur throughout PPH at low densities, but their spread is restricted by climatic conditions. They are found in isolated non-contiguous patches (typically less than 10 acres) and do not currently pose a threat of invading vast areas of PPH or PGH. For more information, see **Section 3.5, Vegetation (Including Noxious Weeds; Riparian and Wetlands)**.

Wildfire is an additional source of impacts on GRSG habitat. Between 2000 and 2012, four wildfires burned 1,938 acres (0.83 percent) in PPH. Over the same time period, eight wildfires burned 303 acres (0.27 percent) in BLM PGH. Increased wildfires and cheatgrass proliferation have not occurred in the LFO,

much different than the Great Basin. For more information, see **Section 3.6**, Wildland Fire Management and Ecology.

Landownership in the planning area is interspersed between federal and non-federal lands (**Table 3-4**, Surface Ownership in PPH and PGH). Important GRSG habitat areas cross both BLM-administered and private lands (also see **Table 3-2** and **Table 3-3**). BLM-administered lands constitute a minority of sagebrush habitat, which increases the risk of habitat fragmentation if federal actions are not coordinated with state and private actions.

***Anthropogenic Disturbances (Broad- and Mid-Scale Indicator)***

Comparing environmental conditions and levels of human disturbance on areas of former range (extirpated range) with areas still occupied by GRSG (occupied range), Wisdom et al. (2011) identified five key factors most likely to lead to extirpation of local populations: sagebrush area, elevation, distance to transmission lines, distance to cellular towers, and land ownership. Land ownership was a surrogate for conversion of private lands to non-sagebrush land uses, most commonly agricultural cultivation, which have reduced habitat availability and fragmented remaining sagebrush habitat nearby. Lek abandonment was most likely to occur in areas with over 25 percent cultivated cropland within 18 miles of the lek (Aldridge et al. 2008).

**Table 3-4**  
**Surface Ownership in PPH and PGH**

<b>Surface Ownership</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
BLM-administered lands	233,219 (39%)	112,341 (19%)
Other federal lands	3,688 (0.4%)	1,717 (0.2%)
State lands	90,587 (17%)	83,438 (16%)
Private	878,171 (17%)	816,869 (16%)
Water	2,329 (0.2%)	670 (0.1%)
<b>Total</b>	<b>1,207,994</b>	<b>1,015,035</b>

Source: BLM 2012a

Transmission lines, in addition to reducing habitat suitability and increasing fragmentation, can cause GRSG mortality through bird collisions with lines and facilitate raptor predation of GRSG. There are currently 800 acres of transmission lines in PGH and 2,600 acres in PPH on BLM-administered land in the planning area. For more information on land ownership and ROWs in the planning area, see **Section 3.4**, Lands and Realty.

Oil and gas developments within two to four miles of leks or nesting areas had deleterious effect on populations, with the effects increasing with higher well

density (Lyon and Anderson 2003; Walker et al. 2007; Johnson et al. 2011). There are 45,400 acres currently leased and undeveloped for oil and gas on BLM-administered land (PPH and PGH) within the planning area. There are no new oil and gas leases in PPH or PGH, and there have been no new oil or gas wells on BLM-administered lands in the last decade.

Cat Creek oil field is located on 951 acres of PPH in the southeastern corner of Yellowstone Watershed and had 38 producing wells in 2011. In operation since the 1920s, the field is largely played out, with most wells plugged and abandoned. Leroy field lies mostly north of the planning area within the Upper Missouri River Breaks National Monument. None of the Leroy field is within PPH, and 3,133 acres are within PGH. In 2011, six producing wells in this field were within the planning area. Gas resources in this field have been depleted, and approximately half of the wells in the area are plugged and abandoned. In addition to activity within these fields, some exploration activity has occurred within the Heath oil shale play in the southern portion of Petroleum County, within PPH and PGH. The Montana Board of Oil and Gas has issued 17 drilling permits for the Heath shale in Petroleum County. Five of these permits have been issued since March 2011 (Montana Board of Oil and Gas Conservation 2012). No permits have yet been issued for drilling on federal minerals in the Heath play.

There is potential for renewable energy (primarily wind), but, to date, all wind turbines in the planning area have occurred only on private lands. For more information on existing mineral leases in GRSG habitat, see **Section 3.7**, Fluid Minerals, **Section 3.8**, Solid Leasable Minerals, **Section 3.9**, Locatable Minerals, and **Section 3.10**, Salable Minerals.

There are still large high-viability habitat patches in the planning area. However, the degree of habitat fragmentation within the patch, in the form of roads, powerlines, corridors, energy sites, livestock watering pipeline systems, OHV trails, mineral sites, canals, landfills, and other sources, affects habitat suitability of the patch for GRSG. In the LFO, roads (including paved, gravel dirt and two-track) occur throughout PPH on both BLM (454 miles) and other lands (2,214 miles). Powerline (62 miles BLM PPH) and telephone (42 miles BLM PPH) ROWs typically are adjacent to the main roadways and occur throughout the area. Fences are common and are primarily four strands of barbed wire. Motorized travel on all LFO BLM-administered lands is limited to existing roads and trails.

SRPs are currently issued to outfitters and guides for big game and upland game, including GRSG. Statewide GRSG harvest has decreased from approximately 30,000 annually historically to approximately 3,200 in 2011. Peak recreational use occurs during the fall hunting season and is primarily to access big game hunting.

Current livestock grazing was a significant causal factor for not achieving land health standards in 78 (54 allotments within GRSG habitat) of the 526 allotments within the planning area. For more information on grazing, see **Section 3.13**, Range Management.

The presence of anthropogenic features between patches also decreases linkages critical to GRSG habitat viability. Continuing pressures for conversion of sagebrush to cropland and for energy development in LFO pose increasing risks of habitat fragmentation, particularly given the mixed pattern of land ownership.

### 3.3.2 Conditions on BLM-Administered Lands

Acres of PPH and PGH on BLM-administered lands within the planning area are presented in **Table 3-1**. The conditions on BLM-administered lands are similar to those discussed in **Section 3.3.1**, Conditions of the Planning Area.

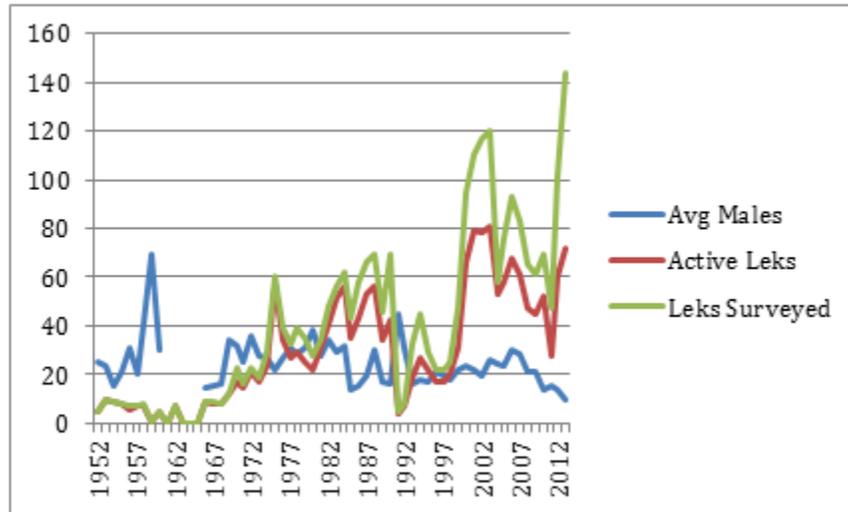
#### **Yellowstone Watershed Population**

The Yellowstone Watershed GRSG population is comprised of five PPH areas within the Billings, Miles City, and Lewistown BLM field offices. PPH within the LFO is made up of four areas: Yellow Water Triangle, War Horse, Crooked Creek and Winifred. Data on GRSG leks within one or more of these areas has been collected by MFWP and the BLM since 1952. Using the highest male counts from each lek annually the number of small (fewer than 10 males), medium (10 or more, but fewer than 25 males), or large (more than 25 males) leks were determined. Large leks have a greater chance at persistence and remaining viable over the long term; small leks are most susceptible to extirpation. In PPH, there were 60 and 72 active leks in 2012 and 2013, respectively. Combining data for 2012 and 2013 yielded 83 active leks. The data from these years were combined to establish a more complete picture than either year would allow individually. The differences between years were primarily survey efforts and weather factors (accessibility to leks) that influenced active lek data.

**Diagram 3-1**, GRSG Survey Effort, Active Leks and Average Male Counts per Active Lek Surveyed in PPH 1952 – 2013, shows the average number of males per active lek over the survey period from 1952 to 2013 in PPH (Yellow Water, War Horse, Crooked Creek and Winifred), along with the number of leks surveyed and the number of active leks (leks in which male GRSG were observed). The gap in the lines indicates years in the 1960s in which no lek count data were available.

Lek count data collection efforts over the years have varied widely, and systematic efforts were not begun until the 1990s; thus, the data must be interpreted with caution. The graph shows a substantial increase in surveying effort in recent years, which has resulted in a larger number of active leks being observed. However, the number of males observed per lek is variable and has

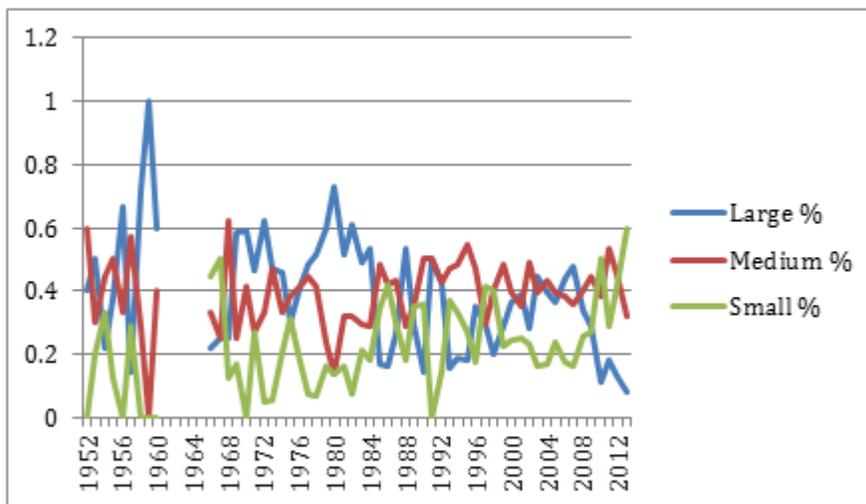
**Diagram 3-1**  
**GRSG Survey Effort, Active Leks and Average Male Counts per Active Lek Surveyed in PPH 1952 – 2013**



declined from approximately 30 males per lek in 2006 to approximately 10 males per lek. The 2013 average male count was at the lowest level since surveys began in 1952.

**Diagram 3-2**, Percentage of PPH Leks in each Size Class 1952 – 2013, shows the percentage of leks measured in the small, medium, and large categories from 1952 to 2013. The number of small leks has increased, while the number of large leks has declined.

**Diagram 3-2**  
**Percentage of PPH Leks in each Size Class 1952 – 2013**



**Table 3-5**, 2012/2013 Active Lek Sizes within Planning Area, shows the sizes of active leks in Yellowstone Watershed and Belt Mountains PPH and PGH in 2012/2013.

**Table 3-5**  
**2012/2013 Active Lek Sizes within Planning Area**

<b>Area</b>	<b>Large</b>	<b>Medium</b>	<b>Small</b>	<b>Total</b>
LFO PPH Yellowstone Watershed Population	11	26	46	83
LFO PGH Yellowstone Watershed Population	0	1	1	2
LFO Belt Mountains Population	0	4	1	5

**Table 3-6**, Land Ownership by Population Area in PPH, shows the percentage of land under BLM and state jurisdiction in each subpopulation in Yellowstone Watershed. In all areas, the percentage of BLM-administered land is less than half, indicating the importance of both federal and private actions for GRSG conservation.

**Table 3-6**  
**Land Ownership by Population Area in PPH**

<b>PPH</b>	<b>% BLM</b>	<b>% State</b>	<b>Acres</b>
Winifred	8	8	162,760
Crooked Creek	19	6	294,202
War Horse	23	7	504,481
Yellow Water Triangle	31	5	137,645

The Winifred area contains the smallest percentage (eight percent) of BLM-administered lands, with much more agriculture (11 percent cropland) and less sagebrush (43 percent) than any other area in PPH. Sagebrush remaining on private, state, and BLM-administered lands allows the 17 GRSG leks (two of which are large) to persist. The two large leks in the Winifred area were just over the 25 threshold.

The Crooked Creek area had 20 leks with males in 2012/2013. The only lek in the large category had over 50 males in 2012. The eastern part of the area contains a large portion of BLM-administered land, and the remainder of the area is mostly private. Agriculture occurs on three percent of the land, while sagebrush is on 63 percent. All fires reported in PPH were located in the Crooked Creek area. Vehicle access for surveys is especially difficult in this area, and there are likely additional leks that have not been discovered to date.

The War Horse area is the largest and contains the greatest amount of BLM-administered lands throughout. There were 35 active leks (six of which are large) in 2012/2013. Cat Creek oil field, in operation since the 1920s, is located on 951 acres of PPH in the southeastern corner of the area. There were 38 producing wells in 2011. The field is largely played out with most wells plugged and abandoned.

The Yellow Water Triangle area contains the largest percentage (31 percent) of BLM-administered lands. The area contains 11 active leks (two of which are large) in 2012 /2013.

#### ***Yellowstone Watershed PGH Lek Information***

There are no leks on BLM-administered lands in PGH. There is much less sagebrush habitat in PGH (38 percent), compared to PPH (57 percent) for all ownerships), and fewer active leks (two) in these areas compared to PPH. Patterns of land ownership within these areas are smaller sized contiguous blocks and a lower proportion of BLM-administration in the area (11 percent PGH on BLM-administered lands compared to 19 percent PPH on BLM-administered lands).

#### ***LFO Belt Mountains Population Lek Information***

The Belt Mountains Population inhabits approximately 300,000 acres of PGH in the planning area (all ownerships), of which BLM administers 439 acres (0.1 percent). BLM habitat includes 310 acres of sagebrush and 36 acres of forested areas. Conifer encroachment on BLM-administered lands is occurring and impacts sagebrush habitats on and adjacent to BLM-administered lands. There were five active leks in 2013, and the closest to BLM was approximately 2.5 miles.

### **3.3.3 Trends**

As show in **Diagram 3-1**, lek counts (average males) in the planning area in 2012/2013 were the lowest since counts began in the 1950s. Several land management factors could be contributing to the decline in GRSG population numbers in the planning area (USFWS 2013, p. 65). Intermingled private land in the traditional GRSG areas has been actively cultivated in recent years, causing a loss of habitat. Some parcels of BLM-administered land contain predominant or continuous stands of crested wheatgrass persisting from the Bankhead-Jones Land Utilization era. Many of these crested wheatgrass dominated lands exhibit little reinvasion of the native sagebrush community and comprise a monoculture with limited GRSG value. Oil and gas development in the LFO has been limited, so this development has minimally contributed to sagebrush habitat loss and fragmentation. Weather, in particular a harsh winter in 2010 followed by a cool, wet spring in 2011 and drought in 2012, was likely the cause for the lower male lek counts recently.

### 3.4 LANDS AND REALTY

Lands and realty actions can be divided between land use authorizations, land tenure adjustments, and withdrawals. Land use authorizations consist of ROWs, communication sites, and other leases or permits, while land tenure adjustments focus primarily on land exchange, acquisition (including purchase and easement acquisition), and disposal. Management and adjustment of withdrawals focuses on the establishment, management, modification, and revocation of withdrawals.

#### ***Land Use Authorizations***

A ROW is the most common form of authorization to permit uses of BLM-administered lands by commercial, private, or governmental entities. A ROW grant is an authorization to use a specific piece of public land for projects such as roads, pipelines, transmission lines, and communication sites. The ROW grant authorizes rights and privileges for a specific period of time.

The BLM's objective is to grant ROWs to any qualified individual, business, or government entity and to direct and control the use of ROWs on BLM-administered lands in a manner that:

- protects the natural resources associated with BLM-administered lands and adjacent lands, whether private or administered by a government entity
- prevents unnecessary or undue degradation to BLM-administered lands
- promotes the use of ROWs in common, considering engineering and technological compatibility, national security, and area RMPs
- coordinates, to the fullest extent possible, all BLM actions with local, State, Native American Tribal, and other federal agencies; interested individuals; and appropriate quasi-public entities (43 CFR 2801.2)

Some uses of BLM-administered lands are authorized through long-term land uses, while permits are used to authorize short-term uses. Private individuals and groups, as well as various businesses and government entities can hold these authorizations.

To the extent possible, linear ROWs (such as roads and pipelines) are routed where impacts would be least disturbing to environmental resources, taking into account point of origin, point of destination, and purpose and need of the project. The ROWs are issued with surface reclamation stipulations and other mitigation measures. Restrictions and mitigation measures may be modified on a case-by-case basis, depending upon impacts on resources. In general, the placement of major linear facilities depends upon meeting the following location criteria:

- concentrate linear facilities within, or contiguous to, existing corridors, where possible
- avoid locations that would take intensively managed forest land out of production
- avoid locations that would harass livestock or wildlife;
- avoid steep topography, poor soils, or other fragile areas (such as habitat for Threatened or Endangered species)
- avoid cultural sites that are listed on, or are eligible for listing on, the National Register of Historic Places

#### ***Land Tenure Adjustments***

Land ownership (or land tenure) adjustment refers to those actions that result in the disposal, or the acquisition by the BLM of non-federal lands or interests in land. FLPMA requires that public land be retained in public ownership unless, as a result of land use planning, disposal of certain parcels is warranted and in the public interest. Tracts of land that are designated in BLM land use plans as potentially available for disposal can be conveyed out of federal ownership through an exchange rather than a sale. Acquisition of and interests in lands are important components of the BLM's land tenure adjustment strategy.

#### ***Withdrawals***

Withdrawals are used to preserve sensitive environmental values, protect major federal investments in facilities, support national security, and provide for public health and safety. A withdrawal is a formal action that accomplishes one or more of the following actions:

- Transfers total or partial jurisdiction of federal land between federal agencies
- Segregates (closes) federal lands to appropriation under public land laws including mineral laws
- Dedicates public land for a specific public purpose

There are three major categories of formal withdrawals: (1) congressional withdrawals, (2) administrative withdrawals, and (3) Federal Power Act or Federal Energy Regulatory Commission withdrawals. Withdrawal segregates a portion of public lands and suspends certain operations of the public land laws, such as mining claims. Certain stock driveways are also withdrawn. Federal policy now restricts all withdrawals to the minimum time and acreage required to serve the public interest, maximizes the use of withdrawn lands consistent with their primary purpose, and eliminates all withdrawals that are no longer needed.

### 3.4.1 Conditions of the Planning Area

The planning area contains lands owned or administered by the BLM, other federal agencies (e.g., Forest Service, the Bureau of Reclamation), various state agencies, and private land owners. **Table 3-7**, Surface Ownership within the Planning Area, shows the acreage and overall percentage of GRSG habitat for each land owner in the planning area. Also see **Figure 3-1** in **Appendix A**.

**Table 3-7**  
**Surface Ownership within the Planning Area**

Surface Ownership	Planning Area (acres)	PPH (acres)	PGH (acres)
BLM-administered lands	593,995	233,219 (39%)	112,341 (19%)
Other federal lands	1,010,816	3,688 (0.4%)	1,717 (0.2%)
State lands	526,504	90,587 (17%)	83,438 (16%)
Private	5,168,165	878,171 (17%)	816,869 (16%)
Water	12,039	2,329 (19%)	670 (6%)
<b>Total Planning Area</b>	<b>7,311,519</b>	<b>1,207,994 (17%)</b>	<b>1,015,035 (14%)</b>

Source: BLM 2012a

#### **WAFWA Management Zones I and 4**

**Table 3-8**, GRSG Habitat within City Limits, through **Table 3-11**, Vertical Obstructions within GRSG Habitat, display data compiled in a BER produced by the USGS and BLM (Manier et al. 2013). In each table, acreages and mileages are presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

There are no utility corridors or utility-scale wind energy developments in the planning area (Manier et al. 2013).

**Table 3-8  
GRSG Habitat within City Limits**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	0	9,300	19,700	0	53	1,100
Forest Service	0	8	700	0	60	0
Tribal and Other Federal	0	200	100	0	0	0
Private	400	113,200	43,400	100	4,100	4,100
State	0	7,300	2,800	0	800	31
Other	0	0	38	0	6	0

Source: Manier et al. 2013, p. 32

**Table 3-9  
Transmission Lines within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	800	35,500	42,000	2,600	7,300	83,600
Forest Service	0	7,300	3,500	0	1,300	5,800
Tribal and Other Federal	0	56,300	4,700	0	700	10,700
Private	4,500	452,600	57,900	9,900	58,500	47,000
State	300	37,800	11,200	1,300	8,100	6,500
Other	0	600	900	0	20	2,800

Source: Manier et al. 2013, p. 41

<sup>1</sup>Includes transmission lines greater than 115 kilovolts.

**Table 3-10  
Number of Communication Towers within GRSG Habitat**

Surface Management Agency	Number <sup>1</sup> within PGH			Number <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	0	108	163	0	20	182
Forest Service	0	36	36	0	1	22
Tribal and Other Federal	1	167	51	0	0	11

**Table 3-10**  
**Number of Communication Towers within GRSG Habitat**

Surface Management Agency	Number <sup>1</sup> within PGH			Number <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
Private	13	2,161	199	18	149	162
State	0	108	23	0	14	17
Other	0	10	3	0	0	0

Source: Manier et al. 2013

<sup>1</sup>Displays the number of Federal Communication Commission communication towers.

**Table 3-11**  
**Vertical Obstructions within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	0	0	12	0	0	17
Forest Service	0	0	0	0	0	0
Tribal and Other Federal	56	7	20	0	0	2
Private	733	230	17	1,015	0	17
State	0	17	7	0	0	0
Other	0	15	0	0	0	0

Source: Manier et al. 2013, p. 45

<sup>1</sup>Derived from dataset containing Federal Communication Commission communication towers and Federal Aviation Administration vertical obstructions. Excludes wind towers. Assumes a buffer of 56.4 meters (2.47 acres) around each obstruction.

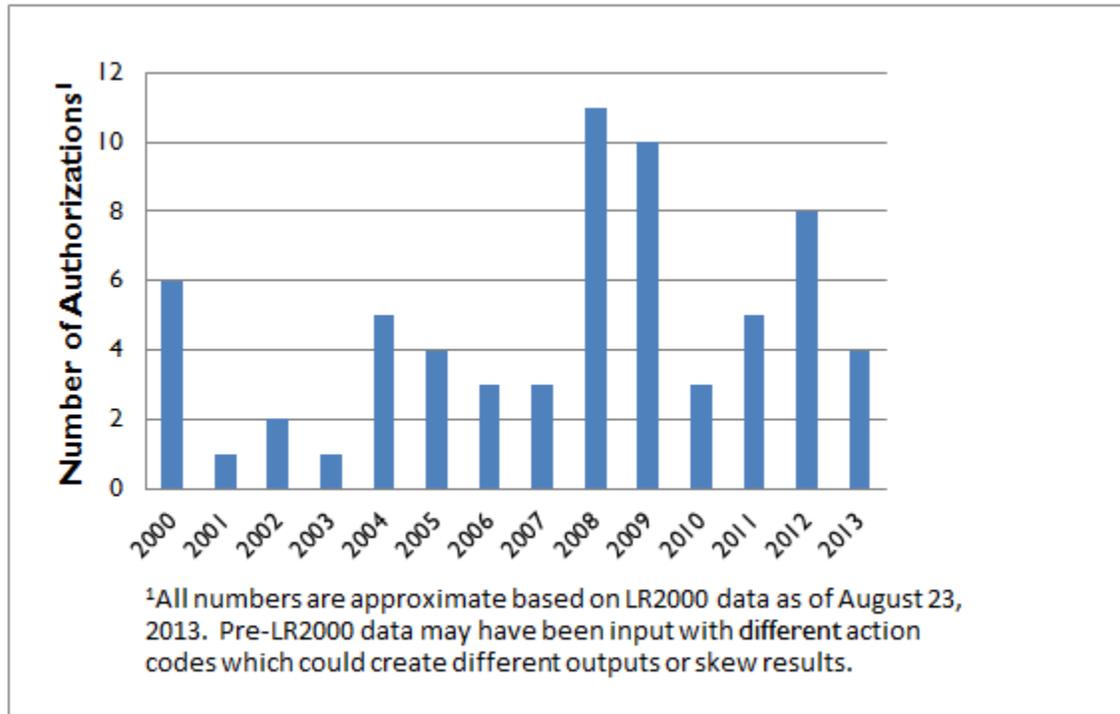
### 3.4.2 Conditions on BLM-Administered Lands

#### **Land Use Authorizations**

**Diagram 3-3**, Land Use Authorizations, provides the number of land use authorizations on BLM-administered lands in Chouteau, Fergus, Judith Basin, Meagher, and Petroleum counties in the planning area between 2000 and 2013.

Within GRSG habitat, there are 643 acres of ROW authorizations in PPH and 266 acres in PGH. **Table 3-12**, Active ROW Authorizations within GRSG Habitat, provides a breakdown of ROW types, miles, and acres in each habitat type.

**Diagram 3-3**  
**Land Use Authorizations**



**Table 3-12**  
**Active ROW Authorizations within GRSG Habitat**

<b>ROW Type</b>	<b>PPH (Miles)</b>	<b>PGH (Miles)</b>
Road/highway	20	10
Power/transmission line	42	15
Telephone	62	19
Water facilities	10	0
Pipeline or conduit	17	8
Railroad	0	1
Other	11	0
<b>Total Miles</b>	<b>162</b>	<b>53</b>
<b>Total Acres</b>	<b>643</b>	<b>266</b>

Source: BLM 2012a

*ROW Avoidance and Exclusion Areas*

ROWs are issued with surface reclamation stipulations and other mitigation measures. Areas closed to mineral leasing, having a NSO restriction, or otherwise identified as unsuitable for surface disturbance or occupancy are

generally identified as avoidance or exclusion areas for ROWs. Restrictions and mitigation measures could be modified on a case-by-case basis for avoidance areas, depending on impacts on resources, while exclusion areas are strictly prohibited from ROW development.

The Acid Shale Pine Forest ACEC (2,463 acres) is the only area identified as a ROW avoidance area in PPH. Judith River Canyon (7,383 acres) is also identified as a ROW avoidance area; 98 percent (7,245 acres) are located within PGH. There are no ROW exclusion areas in the planning area. See **Table 3-13**, ROW Avoidance Areas within the Planning Area.

**Table 3-13**  
**ROW Avoidance Areas within the Planning Area**

<b>Avoidance Area</b>	<b>Total Acres</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
Acid Shale-Pine Forest ACEC	2,463	2,463 (100%)	0
Judith Mountains	19,180	0	0
Judith River Canyon	7,383	0	7,245 (98%)
South Moccasin Mountain	1,167	0	0
<b>Total</b>	<b>30,193</b>	<b>2,463 (8%)</b>	<b>7,245 (24%)</b>

Source: BLM 2012a

#### *ROW Corridors and Communication Sites*

There are no ROW corridors in the planning area. Communication sites contain equipment for various public and private tenants, including phone companies; local utilities; and local, state, and other federal agencies. Communication site applications are granted through a realty lease authorization under the ROW regulations.

BLM-administered lands would continue to be available for multiple- and single-use communication sites and road access ROWs on a case-by-case basis pursuant to Title V of FLPMA, and 43 CFR 2800 regulations. All ROW applications are reviewed using the criteria of following existing corridors wherever practical and avoiding the proliferation of separate ROW.

There are two communication sites on BLM-administered lands within the planning area; however, neither is located within PPH or PGH (see **Table 3-14**, Communication Sites within the Planning Area).

**Table 3-14  
Communication Sites within the Planning Area**

<b>Site</b>	<b>Location</b>
Judith Mountain	NE1/4 SW1/4 Sec 19 T 17 N R 20E MM
South Moccasin Mountain	NE1/4 SW1/4 Sec 2 T 16 N R 17E MM

Source: BLM 2012a

#### *Renewable Energy*

Wind and solar resource facilities are authorized with ROWs through the lands and realty program. Geothermal resources are considered fluid leasable minerals. As a result, management actions related to the lands and realty program and leasable minerals could affect renewable energy resources. Special management designation areas such as ACECs could also affect the use of renewable energy resources by limiting the location of these facilities. There are no active renewable energy ROW authorizations within the planning area. **Section 3.21**, Renewable Energy, provides a description of renewable energy resources.

#### **Land Tenure Adjustments**

##### *Disposal*

There are no pending land sales within the planning area; however, there is one pending land exchange within PPH. Four hundred eighty (480) acres of surface lands are proposed to be exchanged: 240 acres would be moved from private ownership to BLM administration, and 240 acres would be moved from BLM to private ownership. The purpose of this exchange is to resolve a trespassing concern. The proposed exchange includes land containing a GRSG lek site that would be managed by the BLM after the exchange is completed. There are no pending land exchanges in PGH.

##### *Withdrawal*

There are seven withdrawals within GRSG habitat, all of which are held by the US Government. Of these withdrawals, 101 acres are located within PPH and 2,436 are located with PGH (see **Table 3-15**, Withdrawal Lands within GRSG Habitat).

**Table 3-15  
Withdrawal Lands within GRSG Habitat**

<b>Withdrawal</b>	<b>PPH (Acres)</b>	<b>PGH (Acres)</b>
EO Power Site 33	0	1,419
EO Power Site 56	0	119
PLO 2336	41	0

**Table 3-15  
Withdrawal Lands within GRSG Habitat**

<b>Withdrawal</b>	<b>PPH (Acres)</b>	<b>PGH (Acres)</b>
PLO 3633	20	0
Public Water Reserve	40	0
SO Power Site Class 301	0	240
SO Power Site Class 369	0	586
<b>Total</b>	<b>101</b>	<b>2,436</b>

Source: BLM 2012a

EO – Executive Order, PLO – Public Land Order, SO – Secretarial Order (all are held by the US Government)

#### *Acquisitions*

There are no proposed acquisitions in the planning area.

#### **3.4.3 Trends**

On average, there have been five land use authorizations per year between 2000 and 2013 (see **Diagram 3-3**). Demand for land use authorizations in the planning area may increase due to possible oil and gas development in the area. There is some potential for land use authorizations for renewable energy projects (wind, solar, and geothermal), although no requests have been submitted recently. It is anticipated that ROW authorizations for communication sties and utilities will remain at current levels.

The BLM will process land exchanges, acquisitions, easements, and potential sales within the planning area on a case-by-case basis as staff and priority workload allow. As opportunities present themselves, each proposal will be reviewed and given careful consideration to management goals and public benefit. Currently, the land tenure program within the LFO receives very few land tenure adjustment requests per year; it is anticipated that this program will continue to experience low levels of activity.

### **3.5 VEGETATION (INCLUDING NOXIOUS WEEDS; RIPARIAN AND WETLANDS)**

Vegetation serves multiple purposes on the landscape and provides many ecosystem services. Vegetation stabilizes soils, prevents erosion, uses carbon dioxide, releases oxygen, increases species diversity, and provides habitat and food for animals and products for human use. Many of the BLM's land management policies are directed toward maintenance of healthy vegetation communities. Vegetation can be characterized generally by ecological provinces and more specifically by plant communities. The ecological provinces and plant communities discussed below are those that provide the most important land cover across the planning area.

### 3.5.1 Conditions of the Planning Area

#### **All Vegetation**

The planning area lies within two Level III Ecoregions: Northwestern Great Plains and Middle Rockies (EPA 2011a). Most of the planning area is within the Northwestern Great Plains ecoregion, which is characterized by semiarid rolling plains of shale, siltstone, and sandstone punctuated by occasional buttes and badlands. Rangeland is common, but crop and hay production also occur; native grasslands persist in areas of steep or broken topography.

Rangeland vegetation consists of sagebrush grasslands, grasslands, and lightly vegetated badlands. Mixed shrub and deciduous tree communities are found in drainages throughout all of these vegetation types. Common grasses and grass-like species include bluebunch wheatgrass (*Pseudoroegneria spicata*), green needle-grass (*Nasella viridula*), needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), prairie junegrass (*Koeleria macrantha*), blue grama (*Bouteloua gracilis*), prairie sandreed (*Calamovilfa longifolia*), Sandberg bluegrass (*Poa secunda*), and threadleaf sedge (*Carex filifolia*). Introduced grasses are found in some areas, either in pure stands or intermingled with native species.

Crested wheatgrass (*Agropyron cristatum*) is the most prevalent introduced perennial grass in the planning area, with stands occurring in localized areas in several allotments. Smooth brome (*B. inermis*) is also a non-native perennial grass. Introduced annual grasses include cheatgrass (*Bromus tectorum*), and Japanese brome (*B. japonicus*). Although cheatgrass and several non-native brome species are present in the planning area, their spread is restricted by climatic conditions. They are found in isolated, non-contiguous patches and do not currently pose a threat of invading vast areas of PPH or PGH.

Common shrubs in the planning area include big sagebrush (*Artemisia tridentata*), silver sagebrush (*A. cana*), shrubby cinquefoil (*Dasiphora fruticosa* ssp. *floribunda*), wild rose (*Rosa woodsii*), saltbush (*Atriplex* spp.), greasewood (*Sarcobatus vermiculatus*), and rubber rabbitbrush (*Ericameria nauseosa*). Other common vegetation includes prickly pear cactus (*Opuntia* spp.), ponderosa pine (*Pinus ponderosa*), common juniper (*Juniperus communis*), western yarrow (*Achillea millefolium* var. *occidentalis*), wild onion (*Allium* spp.), pussytoes (*Antennaria* spp.), heartleaf arnica (*Arnica cordifolia*), cudweed sagewort (*Artemisia ludoviciana*), milkvetch (*Astragalus* spp.), arrowleaf balsamroot (*Balsamorhiza sagittata*), hairy goldenaster (*Heterotheca villosa*), purple prairie clover (*Dalea purpurea*), low larkspur (*Delphinium bicolor*), black Sampson (*Echineacea angustifolia*), sticky geranium (*Geranium viscosissimum*), curlycup gumweed (*Grindelia squarrosa* var. *quasiperennis*), Rocky Mountain iris (*Iris missouriensis*), lupine (*Lupinus* spp.), yellow sweetclover (*Melilotus officinalis*), woolly Indian wheat (*Plantago patagonica*), Hood's phlox (*Phlox hoodii*), dense clubmoss (*Selaginella densa*),

scarlet globemallow (*Sphaeralcea coccinea* ssp. *coccinea*), and salsify (*Tragopogon dubius*) among others.

Forested vegetation types include ponderosa pine and ponderosa pine/Douglas-fir. Both vegetation types are common on BLM-administered lands. Ponderosa pine is common on south slopes and ridges and the ponderosa pine/Douglas fir type is common on steep north facing slopes. Forested areas are generally patchy and disconnected because of the broken topography.

#### **Riparian and Wetland**

Riparian areas are defined as the green zones associated with lakes, reservoirs, estuaries, potholes, springs, bogs, wet meadows, and streams (ephemeral, intermittent, or perennial). Greasewood and silver sagebrush are common in alluvial flats in or near riparian areas. Woody riparian species found in the planning area include sandbar willow (*Salix exigua*), peachleaf willow (*S. amygdaloides*), yellow willow (*S. lutea*), and plains cottonwood (*Populus deltoides*), Snowberry (*Symphoricarpos albus*), chokecherry (*Prunus virginiana*), hawthorn (*Crataegus* spp.), wild rose, buffaloberry (*Shepherdia* spp.), and gooseberry (*Ribes* spp.) are shrubs commonly found in coulees and woody draws. The riparian zone occurs between the upland zone and the aquatic zone. Riparian areas are characterized by water tables at or near the soil surface, and by vegetation requiring high water tables. See **Figure 3-3**, Wetland and Riparian Areas, in **Appendix A**.

The functioning condition of riparian and wetland areas is a result of the interaction of geology, soil, water, and vegetation (BLM 1998).

#### *Lotic Waters*

Lotic waters are running water systems, such as rivers, streams, and springs. Riparian/wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload, and aid floodplain development
- Improve floodwater retention and groundwater recharge
- Develop root masses that stabilize streambanks against cutting action
- Develop diverse ponding and channel characteristics to provide the habitat, water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses
- Support greater biodiversity

*Lentic waters*

Lentic waters are standing water systems, such as lakes, ponds, seeps, bogs, and wet meadows. Woody sedge (*Carex rosea*) and three-square bulrush (*Schoenoplectus americanus*) are common obligate riparian-wetland plants found in central and eastern Montana. Lentic riparian/wetland areas are functioning properly when adequate vegetation, landform, or debris is present to:

- Dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality
- Filter sediment and aid floodplain development
- Improve flood water retention and groundwater recharge
- Develop root masses that stabilize islands and shoreline features against cutting action
- Restrict water percolation
- Develop diverse ponding characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses
- Support greater biodiversity

Riparian/wetland areas are classified as functional-at-risk when they are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation. These areas are further distinguished based on whether or not they demonstrate an upward, static, or downward trend.

Riparian/wetland areas are classified as nonfunctional when they clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, or providing other functions, as listed above.

Riparian/wetland areas are classified as being in unknown condition when the BLM lacks sufficient information to make a determination. PFC assessments completed on BLM-administered lands are described below in **Section 3.5.2**.

***Noxious Weeds and Invasive Species***

A noxious weed is defined by Montana Law (MCA 7-22-2101) as, “any exotic plant species established or that may be introduced in the state that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses or that may harm native plant communities.” A noxious weed is any unwanted non-native plant with potential impact serious to the extent that it has been declared by the state of Montana that landowners must enter into an approved management program to keep it from spreading. (Montana Department of Agriculture 2010).

Noxious and invasive weeds compete with native vegetation for water, space, and nutrients and have the potential to displace desirable native vegetation to the point of altering the vegetative composition and structure present onsite. Montana's noxious weeds are placed into priorities based on how abundant and widespread the species is across the state. See **Table 3-16**, Montana Noxious Weed List, for a listing of noxious weeds by priority.

Invasive plants also occur within the planning area. These include not only noxious weeds, but also other plants that are not native to the US. The BLM considers plants invasive if they have been introduced into an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread (Westbrooks 1998). Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function (Cronk and Fuller 1995).

**Table 3-16  
Montana Noxious Weed List**

Priority 1A	These weeds are not present in Montana. Management criteria will require eradication if detected; education; and prevention.  - Yellow starthistle ( <i>Centaurea solstitialis</i> )
Priority 1B	These weeds have limited presence in Montana. Management criteria will require eradication or containment and education.  - Dyer's woad ( <i>Isatis tinctoria</i> ) - Flowering rush ( <i>Butomus umbellatus</i> ) - Japanese knotweed complex ( <i>Polygonum</i> spp.) - Purple loosestrife ( <i>Lythrum</i> spp.) - Rush skeletonweed ( <i>Chondrilla juncea</i> ) - Eurasian watermilfoil ( <i>Myriophyllum spicatum</i> ) - Scotch broom ( <i>Cytisus scoparius</i> ) - Curlyleaf pondweed ( <i>Potamogeton crispus</i> )
Priority 2A	These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.  - Tansy ragwort ( <i>Senecio jacobaea</i> ) - Meadow hawkweed complex ( <i>Hieracium</i> spp.) - Orange hawkweed ( <i>Hieracium aurantiacum</i> ) - Tall buttercup ( <i>Ranunculus acris</i> ) - Perennial pepperweed ( <i>Lepidium latifolium</i> ) - Yellowflag iris ( <i>Iris pseudacorus</i> ) - Blueweed ( <i>Echium vulgare</i> ) - Hoary alyssum ( <i>Berteroa incana</i> )
Priority 2B	These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.  - Canada thistle ( <i>Cirsium arvense</i> )

**Table 3-16  
Montana Noxious Weed List**

	<ul style="list-style-type: none"> <li>- Field bindweed (<i>Convolvulus arvensis</i>)</li> <li>- Leafy spurge (<i>Euphorbia esula</i>)</li> <li>- Whitetop (<i>Cardaria draba</i>)</li> <li>- Russian knapweed (<i>Centaurea repens</i>)</li> <li>- Spotted knapweed (<i>Centaurea stoebe</i> or <i>C. maculosa</i>)</li> <li>- Diffuse knapweed (<i>Centaurea diffusa</i>)</li> <li>- Dalmatian toadflax (<i>Linaria dalmatica</i>)</li> <li>- St. Johnswort (<i>Hypericum perforatum</i>)</li> <li>- Sulfur cinquefoil (<i>Potentilla recta</i>)</li> <li>- Common tansy (<i>Tanacetum vulgare</i>)</li> <li>- Oxeye daisy (<i>Chrysanthemum leucanthemum</i> or <i>Leucanthemum vulgare</i>)</li> <li>- Houndstongue (<i>Cynoglossum officinale</i>)</li> <li>- Yellow toadflax (<i>Linaria vulgaris</i>)</li> <li>- Saltcedar (<i>Tamarix</i> spp.)</li> </ul>
Priority 3	<p>Regulated Plants: (NOT MONTANA LISTED NOXIOUS WEEDS)</p> <p>These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.</p> <ul style="list-style-type: none"> <li>- Cheatgrass (<i>Bromus tectorum</i>)</li> <li>- Hydrilla (<i>Hydrilla verticillata</i>)</li> <li>- Russian olive (<i>Elaeagnus angustifolia</i>)</li> </ul>

Source: Montana Department of Agriculture 2010

**WAFWA Management Zones I and 4**

**Table 3-17**, Cheatgrass Potential within GRSG Habitat, and **Table 3-18**, Cropland within GRSG Habitat, display data compiled in a BER produced by the USGS and BLM (Manier et. al. 2013). In these tables, acres with cheatgrass potential and croplands are presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

In **Table 3-17**, cheatgrass potential was not mapped for MZ I. Although the distribution of cheatgrass has been documented in Montana, the currently available model was only parameterized for the Great Basin (MZs III, IV, and V).

**Table 3-17**  
**Cheatgrass Potential within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area <sup>2</sup>	MZ I <sup>2</sup>	MZ IV	Planning Area <sup>2</sup>	MZ I <sup>2</sup>	MZ IV
BLM	n/a	n/a	6,234,900	n/a	n/a	13,995,500
Forest Service	n/a	n/a	1,086,900	n/a	n/a	1,521,600
Tribal and Other Federal	n/a	n/a	740,200	n/a	n/a	974,100
Private	n/a	n/a	4,257,400	n/a	n/a	5,643,800
State	n/a	n/a	945,500	n/a	n/a	1,022,900
Other	n/a	n/a	54,900	n/a	n/a	93,800

Source: Manier et al. 2013

<sup>1</sup>Acreage comprised of areas with a high potential for cheatgrass occurrence.

<sup>2</sup>Cheatgrass occurrence was mapped for MZs III, IV and V (i.e., the Great Basin region), but not for MZs I, II or VII, including the planning area. Data for cheatgrass occurrence in MZ IV at the planning area-level was not available.

**Table 3-18**  
**Cropland within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	800	17,700	14,500	1,200	6,600	14,800
Forest Service	0	1,000	1,800	0	600	900
Tribal and Other Federal	100	534,900	1,800	0	1,300	500
Private	91,000	2,436,900	233,600	98,200	247,400	55,200
State	2,900	93,300	4,400	1,500	5,400	800
Other	0	300	1,300	0	0	200

Source: Manier et al. 2013

<sup>1</sup>Based on data provided by the National Agricultural Statistics Service.

### 3.5.2 Conditions on BLM-Administered Lands

#### **All Vegetation**

Acres of vegetation types within GRSG habitat on BLM-administered lands within the planning area are presented in **Table 3-19**, Vegetation Communities within GRSG Habitat on BLM-Administered Lands. Sagebrush acreage is included under shrubland, steppe, and savanna systems.

**Table 3-19**  
**Vegetation Communities within GRSG Habitat on BLM-Administered Lands**

<b>Vegetation Community</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>	<b>Outside GRSG Habitat (acres)</b>
Human land use	2,592	1,732	582
Aquatic	203	132	75
Sparse and barren systems	2,838	22,597	40,515
Forest and woodland systems	6,906	15,031	91,458
Shrubland, steppe, and savanna systems	173,088	55,787	87,757
Grassland systems	33,485	11,510	20,804
Recently disturbed or modified	4,807	1,757	2,216
Riparian and wetland systems	9,298	3,783	5,042

Source: USGS 2010

The BLM assesses rangeland health on a regular basis. Rangeland health is defined as the degree to which the integrity of the soil, vegetation, water, and air as well as the ecological process of the rangeland system is balanced and maintained (BLM Technical Reference 1734-6, BLM 2005c). Of the 526 allotments on BLM-administered lands within the planning area, 316 are meeting land health standards.

***Riparian and Wetland Vegetation***

Wetland vegetation and associated freshwater habitat within the planning area are presented in **Table 3-20**, Wetland Vegetation and Aquatic Habitat within GRSG Habitat on BLM-Administered Lands.

**Table 3-20**  
**Wetland Vegetation and Aquatic Habitat within GRSG Habitat on BLM-Administered Lands**

<b>Vegetation/Habitat</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>	<b>Outside GRSG Habitat (acres)</b>
Wetland	1,002	77	160
Freshwater pond and lacustrine	974	60	210

Source: USGS 2010

PFC assessments completed on BLM-administered lands within the planning area are presented in **Table 3-21**, PFC Assessments within GRSG Habitat on BLM-Administered Lands.

**Table 3-21**  
**PFC Assessments within GRSG Habitat on BLM-Administered Lands**

<b>PFC Rating</b> <sup>1,2</sup>	<b>PPH (miles)</b>	<b>PGH (miles)</b>	<b>Outside GRSG Habitat (miles)</b>
PFC	43.6	41.6	70.5
FARD	3.9	0.2	2.8
FARN	18.3	16.4	16.6
FARU	10.0	3.4	3.3
NF	12.0	3.3	7.0

Source: BLM 2012a

<sup>1</sup> Dataset is provisional and some stream ratings are not current as of 2012 season

<sup>2</sup> PFC – proper functioning condition; FARD – functional at risk with downward trend; FARN – functional at risk with no trend; FARU – functional at risk with upward trend; NF – non-functional

#### ***Noxious Weeds and Invasive Species***

Infestations of noxious weeds are present on BLM-administered lands, with higher concentrations along the major drainages and their tributaries. Several weed species have been identified within the planning area; the largest areas of infestation are occupied by:

- Leafy spurge
- Canada thistle
- Spotted knapweed
- Russian knapweed
- Field bindweed
- Dalmatian toadflax
- Whitetop (hoary cress)
- Houndstongue
- Salt cedar
- Black Henbane
- Sulfur cinquefoil

Introduced annual brome species, such as downy and Japanese brome, also occur within the planning area. While these species have impacted rangelands within the area, the scale of these impacts has been limited compared with the

impacts from these species in the Great Basin and southwest, due to climactic conditions and vegetation types within the planning area. The BLM has been actively involved in an integrated weed control program within the planning area for several years and continues to monitor for new infestations of other noxious weeds.

### **3.5.3 Trends**

#### ***All Vegetation***

Continuing conversion of rangeland to cropland has caused the loss of shrub-steppe vegetation, including sagebrush. Development pressure on private lands for farmland and oil and gas developments will continue to cause decline of sagebrush ecosystems.

Conifer densities have been increasing in many forested areas. Pine seedlings and saplings are expanding into rangeland areas on forest margins. Heavy stand densities cause competition among conifers, with associated declines in forest health and decreased productivity of understory vegetation such as grasses, forbs, and shrubs. Drought has exacerbated the condition. Understory conifers contribute to fuel loadings that create a continuous fuel bed from the ground to the canopy. Wildland fire can be severe in these areas. The encroachment of ponderosa pine into open parks reduces biodiversity, crowds out sagebrush/grassland habitat and creates an increase threat of severe fires due to an increase in the continuity of fuels.

#### ***Riparian and Wetland***

Riparian and wetland condition in many areas of the planning area are likely to be improved through adjustment and implementation of grazing systems. Based on land health assessments, the trend for many riparian and wetland areas is improving. Riparian-wetland areas in PFC are in an improving trend. As projects intended to meet Standards for Rangeland Health are implemented, conditions are expected to continue to improve.

#### ***Noxious Weeds and Invasive Species***

Weed infestations have grown appreciably during the past two decades. As a result of this expansion of weed infestations, control of noxious weeds within the planning area has become mostly permittee/lessee-based. Permittees and lessees are required to enter into a Cooperative Weed Control Range Improvement Agreement with the BLM for noxious weeds found on their grazing allotments as per terms and conditions on their permits and leases. Under the terms of the cooperative agreements, the BLM provides the chemical for control of the weed species and the permittee/lessee provides the labor for application. Application records and a map of the application are required by the BLM after spraying has been completed.

Biological control agents are also approved for use under the cooperative agreements. Biological control agents have shown promise controlling leafy

spurge and spotted knapweed infestations, which have proven difficult to control on their own because of terrain. Established insect populations are monitored, collected, and dispersed by BLM personnel and permittees. Control agents for dalmation toadflax and Canada thistle have been released within the planning area with limited success. New biological control agents are released within the planning area as they become available and their success monitored.

### **3.6 WILDLAND FIRE MANAGEMENT AND ECOLOGY**

Wildland fire is a general term describing any non-structure fire that occurs in the vegetation and/or natural fuels. Wildland fires are categorized by two types; wildfires, which are unplanned ignitions or planned ignitions that have been declared wildfires, and prescribed fires, which are planned ignitions (Wildland Fire Leadership Council 2009). Wildfire occurs in the planning area, particularly during times of drought.

National BLM fire policy requires that current and desired resource conditions related to fire management be described in terms of fire regime condition class (FRCC). The current condition of a vegetative community is a function of the degree of departure from historical fire regimes, resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, and canopy closure. This departure may have resulted from a number of factors, including fire exclusion or suppression, vegetation resources, grazing, introduction and establishment of exotic plant species, insects or disease (introduced or native), or other past management activities (Hann and Bunnell 2001).

The *Federal Wildland Fire Management Policy* was developed by the secretaries of the departments of Interior and Agriculture in 1995 in response to dramatic increases in the frequency, size, and catastrophic nature of wildland fires in the US. The 2001 review and update of the 1995 *Federal Wildland Fire Management Policy* (DOI et al. 2001) consists of findings, guiding principles, policy statements, and implementation actions, and replaces the 1995 *Federal Wildland Fire Management Policy* as the primary interagency wildland fire policy document. This document directs federal agencies to achieve a balance between fire suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. Multiple updates have been provided in memorandum and current implementation direction has been provided in the February 2009 *Guidance for Implementation of Federal Wildland Fire Management Policy* (USDA and DOI 2009). The BLM's policies follow this plan and implementation guidelines.

Wildland fire has been a primary concern associated with GRS habitat and population declines in the western portion of their range (Great Basin) due to an increase in fire frequency. Climate change may shift the range of invasive plants, potentially expanding the importance of this threat into other areas of the species' range (USFWS 2013).

Spread of invasive weed species is another concern in fire management. Spread of invasive species can displace native species and decrease habitat quality for the GRSG.

### 3.6.1 Conditions of the Planning Area

GRSG largely inhabit the eastern part of the planning region, primarily in Petroleum County and Fergus County. Fires are frequent in the planning area, particularly near the Missouri and Musselshell River Breaks areas. Intense lightning storms occur in the planning region between July and September, often resulting in wildfires (BLM 1992). While cheatgrass is present in the planning area, its spread is restricted by climatic conditions. No large scale fire areas have been invaded by annual grasses; they are found in isolated, non-contiguous patches and do not currently pose a threat of invading vast areas of PPH or PGH.

#### **WAFWA Management Zones I and 4**

**Table 3-22**, Wildland Fire within GRSG Habitat, and **Table 3-23**, High Probability for Wildland Fire within GRSG Habitat, display data compiled in a BER produced by the USGS and BLM (Manier et al. 2013). In each table, acres are presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

**Table 3-22** displays the total acres of land burned in wildland fire in the planning area and MZs I and IV between 2000 and 2012. The majority of fire occurred on tribal and other federal lands.

**Table 3-22**  
**Wildland Fire within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	6,700	74,300	965,900	500	22,000	1,809,400
Forest Service	0	6,400	161,500	0	1,800	33,900
Tribal and Other Federal	15,900	18,300	82,400	0	0	58,100
Private	2,200	446,600	190,300	600	81,000	417,400

**Table 3-22**  
**Wildland Fire within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
State	1,900	35,600	30,900	0	10,600	53,100
Other	0	0	80	0	0	700

Source: Manier et al. 2013

<sup>1</sup>Acres calculated from wildland fires occurring between 2000 and 2012.

**Table 3-23** displays acres with high probability for wildland fire based on the Forest Service's FSim data, a large fire simulator which develops fire probability data based on historical weather data and current land cover data.

**Table 3-23**  
**High Probability for Wildland Fire within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	134,600	718,800	4,438,100	24,100	299,200	11,904,200
Forest Service	0	208,800	621,400	0	124,900	1,163,200
Tribal and Other Federal	22,800	67,800	301,900	0	39,600	487,200
Private	68,400	4,621,600	2,268,400	47,200	1,271,600	4,068,100
State	14,400	523,700	649,700	3,100	185,800	738,700
Other	0	0	26,300	0	0	62,000

Source: Manier et al. 2013

<sup>1</sup>Derived from Forest Service FSim Burn data

### 3.6.2 Conditions on BLM-Administered Lands

In 2004, the BLM developed the Lewistown Field Office Fire Management Plan for central Montana. The plan is currently under revision, with the final revised plan scheduled for release in the summer of 2013. The Fire Management Plan established five Fire Management Units (FMUs) for the LFO: The Big Open FMU, Breaks FMU, Prairie Forest FMU, Island Ranges FMU and the Front FMU. Much of the BLM-administered land that is designated as PPH or PGH is included in the Breaks FMU and the Prairie Forest FMU.

The FRCC is an indicator of ecological departure from historical conditions such as that observed prior to Euro-American settlement. Departure is described as changes to one or more of the following ecological components: vegetation characteristics, fuel composition, fire frequency, in combination with

changes to fire severity and pattern other associated disturbances (insects, disease, grazing, and drought).

The LANDFIRE project includes both a fire regime data layer and a vegetation departure data layer, which were used to estimate the degree of ecological departure for the different GRSG habitat types in the planning area. Class I represents a low degree of departure, and Class III a high degree of departure. Extreme departure from the historical conditions results in changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g., insect and disease mortality, grazing, and drought). See **Figure 3-4**, Fire Regime Condition Class, in **Appendix A**, for the FRCC and LANDFIRE distribution in the planning area.

National vegetation condition class data is displayed below in **Table 3-24**, National Vegetation Condition Class on BLM-Administered Lands, the data provides an indication of the departure in PPH and PGH on BLM-administered lands in comparison to areas with non-habitat.

**Table 3-24**  
**National Vegetation Condition Class on BLM-Administered Lands**

<b>BLM-Administered Land Area</b>	<b>Habitat Type</b>	<b>Vegetation Condition Class</b>	<b>Acreage</b>
Judith Resource Area	Non Habitat	Class I	19,871
		Class II	54,128
		Class III	165,959
	PGH	Class I	35,270
		Class II	27,286
		Class III	48,677
	PPH	Class I	7,502
		Class II	96,242
		Class III	127,882
Headwaters	Non Habitat	Class I	935
		Class II	4,974
		Class III	1,521
	PGH	Class I	47
		Class II	216
		Class III	170
	PPH	Class I	N/A
		Class II	N/A
		Class III	N/A

Source: BLM 2012a  
N/A = not applicable

There is an average of only two human-caused fires every 10 years on BLM-administered land (BLM 2012a). Human-caused fires often occur as a result of debris burning or agricultural operations (BLM 2004a). Other fires on BLM-administered lands have been ignited during intense lightning storms that are common in the area. While the total acreage burned on BLM-administered lands over the past 10 years is relatively small, fires still result in impacts on GRSG and their habitat.

No fire history data exists for the Headwaters Resource Management Plan area. In the Judith Resource Area Resource Management Plan area, there have been 12 fires over the past 10 years, burning approximately 33,440 acres total. Of this amount, approximately 31,200 acres burned were non-habitat lands, 290 acres of PGH were burned, as were 1,950 acres of PPH. This data does not include all fire within the planning area. **Table 3-25**, Fires on BLM-Administered Lands within the Judith Resource Area RMP Area (1992-2012), displays information about fires on BLM-administered lands in the planning area.

**Table 3-25**  
**Fires on BLM-Administered Lands within the Judith Resource Area RMP Area (1992-2012)**

Year	Fire Name	Fire Source	No Habitat Acreage	PGH Acreage	PPH Acreage
1995	Lower Dunn	Lightning	186.2		
1996	Alkali	Lightning	1,546.1		
1999	377	Lightning	125		
2000	Blood	Lightning	539.0		
2002	Browning	Lightning	15.1		
	Armells	Lightning	4.8		
2003	Barrel Springs 3	Lightning	16.1		
	Tin Can	Lightning	92.6		
2005	McArthur	Lightning	416.9		
	Dovetail	Lightning	2597.3		
2006	Drag	Lightning	741.8		
	Soda Creek	Lightning	6,163.3		
	Chouteau Co Assist	Lightning	29.5		
	Fargo Coulee	Lightning	0.0		
2007	Last Day	Lightning	250.5		
	South Moccasin	Human	48.9		
	Salt Creek	Lightning	0	47.9	
	South McGinnis	Lightning			23.2

**Table 3-25**  
**Fires on BLM-Administered Lands within the Judith Resource Area RMP Area**  
**(1992-2012)**

<b>Year</b>	<b>Fire Name</b>	<b>Fire Source</b>	<b>No Habitat Acreage</b>	<b>PGH Acreage</b>	<b>PPH Acreage</b>
2008	79 Trail	Lightning	156.3		
	Blood Creek	Lightning	14.3		
	Pickett	Lightning	25.1		
2009	Meissner	Human	184.3	3.2	
2010	Raven Rat Patch	Lightning	6,653.7		477.4
2011	Blue Dunn	Lightning	16.2		
	15 Mile	Lightning	860.7		193.6
	Arrow 2	Lightning		9.9	
	Arrow	Lightning		18.5	
	Boyce	Lightning	5.1	201.3	
	Carol	Lightning		2.1	
	Chain Buttes	Lightning	3,000.2		
	First Time	Lightning		12.7	
	Kingsbury	Lightning		6.8	
	South Chain	Lightning	737.9		
2012	Wolf Creek	Lightning	6,880.7		1,244.4

Source: BLM 2012a

Fires that occur within PPH and PGH would pose the greatest threat to GRSG. Fires within PPH would be particularly damaging because these areas have been identified as having the highest conservation value to maintaining sustainable GRSG populations.

Wildland fire use will not be part of the LFO fire management strategy due to high winds, difficulties in maintaining pre-determined fire sizes, and the large amount of damage fire could do to grazing allotments (BLM 2004a). This could serve to prevent the spread of fire and protect GRSG habitat.

Of the five FMUs in the LFO, all are explicitly managed to protect sagebrush habitat or GRSG. This could also result in management actions that would protect GRSG habitat from impacts due to wildland fire.

### 3.6.3 Trends

Over the past 10 years, two human-caused fires have been reported as occurring on BLM-administered lands in the planning area. Wildland fire, typically caused by lightning, has historically occurred within the planning area

and tends to occur between July and September (BLM 1992). Fires will likely increase in the future as climate change causes irregular weather patterns, increases the likelihood of storms, and contributes to droughts that can increase the frequency of natural, unplanned ignitions. Management actions, such as implementing green strips and hazardous fuel reductions, can reduce the occurrences of such fires.

### 3.7 FLUID MINERALS

Fluid leasable minerals include oil, gas, and geothermal heat. In general, leasable minerals are governed by the Mineral Leasing Act of 1920, as amended, which authorized specific minerals to be disposed of through a leasing system. Geothermal heat is also considered a leasable mineral and is governed by the Geothermal Steam Act of 1970. There are no geothermal resources within the planning area; therefore, geothermal resources will not be discussed in **Chapter 3** or **Chapter 4**.

The BLM reserves the right to require additional mitigation measures in the form of COAs after a lease is issued if doing so is necessary to fulfill the BLM's multiple-use mandate.

#### 3.7.1 Conditions of the Planning Area

This discussion focuses solely on oil and gas because those are the only fluid minerals that exist within the planning area.

In 2011, Chouteau County was the top gas-producing county in the planning area, producing over one million MCF (thousand cubic feet) of gas. However, only a portion of Chouteau County is within the planning area, and the gas fields in that county are outside the planning area. Fergus and Petroleum Counties are the only counties currently producing oil and gas within the planning area (see **Figure 3-5**, Fluid Minerals – Existing Leases, in **Appendix A**). **Table 3-26**, 2011 County Drilling and Production Statistics, provides oil and gas activity in counties within the planning area.

The primary fields producing in the planning area are Cat Creek field in Petroleum County and Leroy field at the northern border of Fergus County. Approximately 951 acres (91 percent) of the Cat Creek field lies within PPH. The other nine percent is within PGH.

The majority of the Leroy field lies north of the planning area within the Upper Missouri River Breaks National Monument. Of the 3,166 acres of the Leroy field within the planning area, 3,133 acres (99 percent) are within PGH. The other one percent of this field in the planning area is not within GRSG habitat.

Oil production from the Cat Creek field began in the 1920s. Since that time, wells in the field have produced over 24 million barrels of oil. A total of 215 wells have been drilled in the field. In 2011, the 38 producing wells in the field

**Table 3-26**  
**2011 County Drilling and Production Statistics**

County	Production			Well Completion				
	Oil Barrels	Associated Gas (MCF)	Gas (MCF)	Oil	Gas	Coalbed Methane	Dry	Service
Fergus	0	0	29,743	0	2	0	1	0
Petroleum	24,700	4,008	0	6	0	0	2	0
Chouteau <sup>1</sup>	0	0	1,066,261	0	2	0	2	1
Judith Basin	0	0	0	0	0	0	0	0
Meagher	0	0	0	0	0	0	0	0
<b>Total</b>	<b>24,700</b>	<b>4,008</b>	<b>1,096,004</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>1</b>

Source: DNRC 2011

<sup>1</sup>Production and wells within Chouteau County are not within the range-wide planning area.

produced 23,854 barrels of oil. Oil and gas resources in the field have largely played out, and most wells are plugged and abandoned (DNRC 2011 p. 16-10).

The Leroy Field contains gas resources, primarily in the Judith River and Eagle gas sands. Cumulative gas production from the field is nearly seven million MCF. In 2011, the 24 producing wells in the field produced 186,047 MCF of gas. Six of the producing wells in this field are within the planning area (DNRC 2011 p. 16-30). These wells produced 27,966 MCF of gas in 2011 (Montana Board of Oil and Gas Conservation 2012). Gas resources in this field have been depleted, and approximately half of the wells in the area are plugged and abandoned.

In addition to activity within these fields, some exploration activity has occurred within the Heath oil shale play in the southern portion of Petroleum County. This play is within PPH and PGH. The Montana Board of Oil and Gas has issued 17 drilling permits for the Heath shale in Petroleum County. Five of these permits have been issued since March 2011 (Montana Board of Oil and Gas Conservation 2012). No permits have been issued for drilling on federal minerals in the Heath play, and the economics of producing oil from this play are still uncertain.

There are 11 active wells in Fergus County (outside of the Leroy field). These are all shut-in gas wells on private or state minerals.

#### **WAFWA Management Zones 1 and 4**

**Table 3-27**, Open to Oil and Gas Leasing within GRSG Habitat, through **Table 3-31**, Oil and Gas Wells within GRSG Habitat, display data compiled in a BER produced by the USGS and BLM (Manier et. al. 2013). In each table, acres are

**Table 3-27**  
**Open to Oil and Gas Leasing within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM <sup>1</sup>	273,800	3,970,400	4,662,800	225,100	2,792,800	12,348,100
Forest Service	0	484,100	240,200	0	284,300	234,200
Tribal and Other Federal	36,000	329,800	500	3,100	84,000	10,300
Private	157,200	6,510,600	173,100	148,600	2,071,900	275,900
State	900	98,800	8,600	1,800	82,200	20,400
Other	0	900	0	0	0	0

Source: Manier et al. 2013

<sup>1</sup> There is an existing protest resolution decision affecting BLM-administered lands within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, including leasing on PPH and PGH, or PH and GH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS. The information provided in this table is for establishing the baseline for cumulative effects analysis only.

**Table 3-28**  
**Closed to Oil and Gas Leasing within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM <sup>1</sup>	100	370,100	261,500	0	150,100	1,304,200
Forest Service	0	16,600	4,600	0	0	69,600
Tribal and Other Federal	0	1,594,400	442,300	0	1,400	637,300
Private	500	1,848,000	9,800	100	505,600	26,500
State	0	315,400	9,300	0	63,700	21,600
Other	0	0	45	0	0	0

Source: Manier et al. 2013

<sup>1</sup> There is an existing protest resolution decision affecting BLM-administered lands within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, including leasing on PPH and PGH, or PH and GH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS. The information provided in this table is for establishing the baseline for cumulative effects analysis only.

**Table 3-29**  
**Oil and Gas Leases within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	15,200	624,200	74,500	30,200	327,600	215,700
Forest Service	0	29,700	3,800	0	24,900	1,700
Tribal and Other Federal	0	5,000	900	0	0	0
Private	12,100	1,721,900	21,000	12,300	546,200	28,500
State	400	27,900	0	400	17,400	40
Other	0	0	0	0	0	0

Source: Manier et al. 2013

**Table 3-30**  
**Oil and Gas Leases Held by Production within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	3,200	673,900	0	100	110,600	0
Forest Service	0	80,900	0	0	36,900	0
Tribal and Other Federal	0	19,500	0	0	0	0
Private	2,000	1,819,300	0	800	236,400	0
State	0	13,500	0	0	3,400	0
Other	0	0	0	0	0	0

Source: Manier et al. 2013

**Table 3-31**  
**Oil and Gas Wells within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	100	26,200	25	200	4,600	100
Forest Service	0	2,100	6	0	1,500	3
Tribal and Other Federal	0	3,400	0	0	6	3
Private	700	140,400	100	1,300	21,400	100

**Table 3-31**  
**Oil and Gas Wells within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
State	100	15,400	8	0	2,500	6
Other	0	0	0	0	0	0

Source: Manier et al. 2013

<sup>1</sup>Assumes footprint of 62 square meters per well. Includes wells that are either not plugged and abandoned, or plugged and abandoned beginning October, 2001.

presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

There are no oil shale leases in the planning area (Manier et al. 2013).

### 3.7.2 Conditions on BLM-Administered Lands

While the BLM administers 593,995 acres of surface within the planning area, the BLM also manages the subsurface minerals underlying 1,113,841 acres in the planning area (including federal subsurface beneath BLM-administered lands). Split-estate lands are lands on which the surface is owned or controlled by an entity other than the BLM and the subsurface is managed by the BLM. **Table 3-32**, Federal Mineral Status in the Planning Area, provides the surface ownership above federal minerals in the planning area.

**Table 3-32**  
**Federal Mineral Status in the Planning Area**

Land Status	Acres
BLM Surface/Federal Minerals	593,995 (53%)
Private Surface/Federal Minerals	510,532 (46%)
State/Federal Minerals	9,311 (1%)
<b>Total</b>	<b>1,113,841</b>

Source: BLM 2012a

There are 89,761 acres of existing oil and gas leases on federal minerals in the planning area. These leases cover eight percent of the federal mineral estate in the decision area. **Table 3-33**, Existing Oil and Gas Leases, breaks down existing leases within PPH and PGH. A total of 42,716 acres (48 percent) of existing leases in the decision area are within PPH.

**Table 3-33**  
**Existing Oil and Gas Leases**

<b>Habitat Type</b>	<b>Acres Leased</b>
Total Area (BLM surface/federal minerals)	55,880 (100%)
Total Area (Private or state surface/federal minerals)	33,881 (100%)
PPH (BLM surface/federal minerals)	29,922 (54%)
PPH (Private or state surface/federal minerals)	12,794 (38%)
PGH (BLM surface/federal minerals)	17,045 (31%)
PGH (Private or state surface/federal minerals)	13,930 (41%)
Other Areas (BLM surface/federal minerals)	8,606 (15%)
Other Areas (Private or state surface/federal minerals)	6,112 (18%)

Source: BLM 2012a

The BLM manages surface and subsurface minerals in each of the main oil and gas fields in the planning area. While much of the historical development of the Cat Creek field has been on federal mineral estate, no new drilling activity in the field is occurring on federal minerals. The Cat Creek Field has 28 active wells on federal minerals: 15 producing oil wells, six shut-in oil wells, two water source wells, and five active injection wells for enhanced oil recovery. The portion of the Leroy field within the planning area currently has five active wells on federal mineral estate. They are all producing gas wells.

A protest resolution decision applicable to the LFO requires all nominated oil and gas lease parcels that would require a special stipulation to protect important wildlife values be deferred until an RMPA for oil and gas, or an RMP revision that includes an oil and gas leasing decision in the ROD is completed. All federal fluid mineral estate acres within PPH and PGH are deemed to require special wildlife stipulations and will be deferred from leasing. The boundaries of PPH and PGH are equal to PH and GH, respectively. As such, the

deferral of nominated lease parcels would continue in PH and GH after the ROD for this amendment is signed.

### 3.7.3 Trends

Because the primary oil and gas fields within the planning area are largely played out, the level of activity on existing leases within the planning area is likely to remain relatively stable for the life of the Judith Resource Area and Headwaters Resource Management Plans. The one possible exception is the Heath shale play, where activity on leases is still in early stages. If this play proved to be economic, drilling and production in the vicinity of the play in southern Petroleum County could greatly increase.

Due to an existing protest resolution, the LFO will not issue oil and gas leases for parcels that provide important wildlife habitat, including PPH and PGH.

## 3.8 SOLID LEASABLE MINERALS

Solid leasable minerals are primarily governed under two acts: the Mineral Leasing Act of 1920, as amended, and the Mineral Leasing Act for Acquired Lands of 1947, as amended.

The Mineral Leasing Act of 1920 authorized specific minerals, including but not limited to coal, sodium, potash, and phosphate, to be disposed of through a leasing system. Coal is the only mineral governed by this Act that exists within the planning area, but no coal is being developed.

Pursuant to the Mineral Leasing Act for Acquired Lands of 1947, as amended, all minerals that qualify as locatable minerals in public domain lands may only be obtained through leasing on acquired lands. (Public domain lands have always been in federal ownership, while acquired lands were purchased by the government from private individuals.)

The BLM first issues a prospecting permit for exploration for nonenergy solid leasable minerals. A prospecting permit term is two years, but it may be extended by another four years with adequate justification. If, during the term of the permit, the permittee demonstrates discovery of a valuable deposit of the leasable mineral resource, the BLM may issue a lease to that permittee.

### 3.8.1 Conditions of the Planning Area

No coal mining is occurring within the planning area, although potential for coal resources does exist within the area. The Kootenai formation underlies the central portion of the planning area and contains the Lewistown and Great Falls coal fields (BLM 1992 p. 105). This formation is not within GRSG habitat.

Because leasing of hardrock minerals only occurs beneath BLM-administered lands, discussion of conditions of these resources occurs under *Conditions on BLM-Administered Lands*.

### 3.8.2 Conditions on BLM-Administered Lands

The BLM administers 820,108 acres of federal mineral estate (593,995 acres of BLM-administered land with federal minerals and 226,113 acres of split-estate) in the planning area. Within GRSG habitat, the BLM administers 345,560 acres (16 percent) of surface over federal minerals and another 108,410 acres (five percent) of split-estate.

The BLM has not issued leases for development of federal coal resources in the planning area. There are no known federal coal resources within GRSG habitat.

Over the last 10 years, the BLM has issued 14 prospecting permits for nonenergy solid minerals on acquired lands in the planning area. Generally, three to four prospecting permits are authorized at any given time. As of December 2012, one prospecting permit is currently valid. All prospecting permits in the planning area have been issued within PPH in Petroleum County. Most have been issued along the southwestern border of Petroleum County. Others have been issued along the southeastern border of the county near the Musselshell River or further north along the western border of the county. The primary minerals of interest for prospecting permits are diamonds and gems.

### 3.8.3 Trends

Based on the nature and depth of the coal beds in area, the most likely location for development within the planning area would be the Lewistown and Great Falls coal fields in the Kootenai Formation. Neither of these coal fields lies within PPH or PGH.

Although no mineral development potential was identified in the 1992 Hardrock Mineral Resources Reasonable Foreseeable Development Scenario for the Judith Resource Area, the acquired lands overlying hardrock minerals likely have low to medium development potential for hardrock minerals based on the exploration activity in recent years. Hardrock mineral prospecting is anticipated to continue at the current rate of three to four active prospecting permits per year throughout the life of Judith Resource Area and Headwaters Resource Management Plans.

## 3.9 LOCATABLE MINERALS

Locatable minerals are minerals for which the right to explore or develop the mineral resource on federal land is established by the location (or staking) of mining claims and is authorized under the General Mining Law of 1872. Locatable minerals include metallic minerals (such as gold, silver, copper, lead, zinc, molybdenum, uranium) and non-metallic minerals (such as gypsum).

### 3.9.1 Conditions of the Planning Area

Locatable mineral development potential exists within Fergus and Judith Basin Counties. In Fergus County, development potential exists in the Judith Mountains and the North and South Moccasin Mountains. The Judith and Moccasin Mountains range from low to high potential with gold and silver as the

primary minerals of interest. Mining and exploration have occurred and continue in each of these areas (BLM 1992 Map K, p. 105–107, 324).

In Judith Basin County, development potential exists in the Little Belt Mountains and Yogo Gulch area. Locatable mineral development potential in this area ranges from low to high, with sapphires as the primary mineral of interest. Historic mining for lead, zinc, silver, and gold ores has also occurred in this area (BLM 1992 Map K, p. 107, 327, 331).

None of the areas identified having locatable mineral development potential in the planning area is within PPH or PGH.

### **3.9.2 Conditions on BLM-Administered Lands**

The BLM administers 820,108 acres of federal mineral estate (593,995 acres of BLM-administered land with federal minerals and 226,113 acres of split-estate) in the planning area. Within GRSG habitat, the BLM administers 345,560 acres (16 percent) of surface over federal minerals and another 108,410 acres (five percent) of split-estate.

A total of 101 acres (less than one percent) of federal mineral estate PPH is withdrawn from locatable mineral entry and therefore cannot be developed. Additionally, 2,437 acres (one percent) of federal mineral estate in PGH are withdrawn from locatable mineral entry.

### **3.9.3 Trends**

While locatable mineral exploration and development is likely to continue to occur within the planning area, no locatable mineral development is anticipated within GRSG habitat over the life of the Judith Resource Area and Headwaters Resource Management Plans.

## **3.10 SALABLE MINERALS**

Salable minerals include common varieties of construction materials and aggregates, such as sand, gravel, cinders, roadbed, and ballast material. Salable minerals are sold or permitted under the Mineral Materials Sale Act of 1947.

Sand and gravel, as construction aggregate, is an extremely important resource. The extraction of the resource varies directly with the amount of development nearby – road building and maintenance and urban development – as sand and gravel is necessary for that infrastructure development. Even more so than other resources; however, the proximity of both transportation and markets are key elements in the development of a deposit.

### **3.10.1 Conditions of the Planning Area**

Much of the surface geology in the planning area is dominated by late Cretaceous shale and sandstone layers, deposited during transgression and regression of the inland sea. These rocks are source to building materials and clays. In more recent times, erosion has dissected the landscape to its present

form. Alluvial material derived from erosion of exposed bedrock or reworking of glacial deposits is the primary source of sand and gravel.

#### **WAFWA Management Zones I and 4**

**Table 3-34**, Salable Material Disposal Sites within GRSG Habitat, displays data compiled in a BER produced by the USGS and BLM (Manier et al. 2013). Acres are presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

**Table 3-34**  
**Salable Material Disposal Sites within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	200	64,500	189,900	100	65,000	462,100
Forest Service	0	1,200	56,500	0	0	113,700
Tribal and Other Federal	0	0	400	0	0	500
Private	0	430,500	80,200	1,200	49,000	139,200
State	0	7,800	3,400	0	8,900	3,600
Other	0	0	45	0	0	39

Source: Manier et al. 2013

#### **3.10.2 Conditions on BLM-Administered Lands**

The BLM administers 820,108 acres of federal mineral estate (593,995 acres of BLM-administered land with federal minerals and 226,113 acres of split-estate) in the planning area. Within GRSG habitat, the BLM administers 345,560 acres (16 percent) of surface over federal minerals and another 108,410 acres (five percent) of split-estate.

The salable minerals program on BLM-administered lands within the planning area is based on the use of sand and gravel for construction and road surfacing (BLM 1992 p. 110).

Most salable minerals permits issued within the planning area have been free use permits issued to the county or state governments for road construction or maintenance. Several other small sales have been made to local contractors for maintenance of Air Force missile roads (BLM 1992 p. 111).

There are four active sand and gravel pits on federal minerals within the planning area. Two of these are within PPH, and one is within PGH. Each pit is less than five acres.

Within PPH, 101 acres (less than one percent) of federal mineral estate are closed to the disposal of salable minerals. Within PGH, 2,437 acres (one percent) of federal mineral estate are closed to the disposal of salable minerals.

### 3.10.3 Trends

Future demand for salable minerals will vary depending upon market conditions, which differ according to economic conditions and construction activity. It is expected that salable mineral activity will continue at roughly the same level for the life of the Judith Resource Area and Headwaters Resource Management Plans.

## 3.11 COMPREHENSIVE TRAVEL AND TRANSPORTATION MANAGEMENT

The transportation system throughout the planning area consists of seven major highways, numerous paved and unpaved local roads, as well as unpaved primitive OHV roads and trails. Where roads cross BLM-administered land, ROW authorizations are required to maintain the road on federal land. A more detailed inventory of the existing transportation network will be conducted as part of a future LFO RMP revision.

### 3.11.1 Conditions of the Planning Area

Transportation routes in the planning area reflect the region's low population density and challenging topography. Throughout the planning area there are approximately 4,390 total miles of roads and trails. Major highways (such as US Highways 87, 191, and 89 and State Route 19) provide arterial connections to population centers mainly outside the planning area. Smaller local paved and unpaved roads, primitive roads, and trails account for the remainder of the transportation network in the planning area. Local roads mainly provide access to large private ranchlands.

#### **WAFWA Management Zones I and 4**

**Table 3-35**, Miles of Roads within GRSG Habitat, through **Table 3-37**, Miles of Railroads within GRSG Habitat, display data compiled in a BER produced by the USGS and BLM (Manier et. al. 2013). In each table, acres and miles are presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was "frozen" in time for analysis purposes; however, these scenarios remain based in present

**Table 3-35**  
**Miles of Roads within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	319	7,400	6,500	454	4,700	18,900
Forest Service	0	1,200	1,200	0	700	1,900
Tribal and Other Federal	124	5,800	700	10	300	1,000
Private	1,447	59,700	7,200	2,036	16,600	8,700
State	121	5,200	1,300	168	1,900	1,800
Other	0	0	79	0	0	100

Source: Manier et al. 2013

**Table 3-36**  
**Acres of Roads within GRSG Habitat**

Surface Management Agency	Acres within PGH <sup>1</sup>			Acres within PPH <sup>1</sup>		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	3,200	79,600	68,500	4,500	48,200	199,400
Forest Service	0	12,300	12,900	0	7,200	20,100
Tribal and Other Federal	1,300	61,500	8,000	100	3,300	11,200
Private	14,800	675,000	83,500	20,800	176,200	100,900
State	1,200	58,600	14,100	1,700	20,300	18,800
Other	0	300	800	0	0	1,200

Source: Manier et al. 2013, p. 35

<sup>1</sup>Assumes footprint of 73.2 meters for interstate highways, 25.6 meters for primary and secondary highways, and 12.4 meters for other roads.

**Table 3-37**  
**Miles of Railroads within GRSG Habitat**

Surface Management Agency	Miles within PGH			Miles within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	0	50	100	0	9	100
Forest Service	0	28	1	0	0	8

**Table 3-37**  
**Miles of Railroads within GRSG Habitat**

Surface Management Agency	Miles within PGH			Miles within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
Tribal and Other Federal	0	83	14	0	0	19
Private	41	1,200	300	0	146	100
State	1	90	12	0	10	12
Other	0	1	0	0	0	0

Source: Manier et al. 2013

knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

#### **Off-Highway Vehicles**

OHVs are used primarily as a mode of transportation for accessing areas to participate in other recreation activities such as hunting, camping, or fishing. OHVs are also used throughout the planning area to manage livestock grazing. In accordance with Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota, motorized cross-country travel is prohibited in all three states. OHVs must therefore remain on existing travel routes at all times unless travel is administrative use or an exception as described in the OHV ROD (BLM 2003b).

#### **3.11.2 Conditions on BLM-Administered Lands**

Transportation routes on BLM-administered lands in the planning area are limited due to the dispersed nature of BLM parcels. The combined length of all roads and trails on BLM-administered lands in PPH areas is 467 miles, while PGH areas contain 128 miles of roads and trails. Travel routes on BLM-administered lands are primarily a mixture of publically-maintained paved and unpaved roads and privately-maintained unpaved roads. Local and agricultural traffic is the primary use of these roadways. Additionally, based on data from Recreation Management Information System, there are approximately 20,100 visits to the 15 ERMA's located in PPH. Due to the popularity of the ERMA's, which are all reservoirs, the use of access roads to the ERMA's increases travel in the area, especially during popular recreation seasons.

### 3.11.3 Trends

Use of the existing transportation network in the planning area is expected to steadily increase over time as adjacent areas become more urbanized and national demand for outdoor recreation opportunities, such as hunting, fishing, and camping increase. OHV use is expected to continue as a means to support hunting opportunities and the maintenance of grazing rights.

## 3.12 RECREATION

Recreation opportunities in the planning area are abundant. Most recreation users participate in dispersed recreation activities, including hunting, fishing, camping, biking, hiking, horseback riding, boating on area lakes and rivers, pleasure driving, and wildlife viewing. Users often participate in these activities individually or in small groups.

### 3.12.1 Conditions of the Planning Area

PPH and PGH areas, which are dispersed mainly throughout the eastern portion of the planning area, cover 2,223,029 acres. PPH is confined to Fergus and Petroleum counties, while PGH occurs within Chouteau, Judith Basin, Meagher, Fergus, and Petroleum counties. ERMA's are located only within PPH, and SRMA's are only located within PGH.

Recreation opportunities in these areas are mainly of a dispersed nature with hunting and fishing being the primary activities. Within the planning area, 76 percent of the surface land area is privately owned. The scattered distribution of BLM-administered land limits the extent of public recreation opportunities throughout the planning area.

Since hunting is one of the primary recreation uses in the planning area, fall is the most popular season for recreation activity. Summer activities are largely concentrated around water bodies and include fishing, camping, hiking, sightseeing, and wildlife viewing. Winter recreation activities include ice fishing, hiking, and trapping.

#### **Hunting**

Big game hunting is a popular recreation activity in the planning area. The MFWP issues hunting licenses for deer, pronghorn antelope, and Rocky Mountain elk. The MFWP places restrictions on the time of year, location, method of take, and daily bag and possession limits. Statewide, annual harvest of elk averaged 16,182 between 2004 and 2011. During the same period, the annual harvest of deer averaged 49,583, while antelope harvest averaged 16,854 (MFWP 2011).

The MFWP also permits the hunting of a number of smaller upland bird species, including GRSG. The GRSG hunting season is from September 1 through November 1 east of the continental divide. GRSG may be hunted using a ten gauge or smaller shotgun or by bow and arrow. The daily bag limit is two, and the possession limit is four.

Statewide, annual harvest of GRSG has averaged 29,700 birds between 1958 and 2011. Between 1997 and 2001, the annual harvest averaged less than 7,000 (MFWP 2004). In 2011, the MFWP estimated the harvest to be less than 3,200 (MFWP 2011).

#### **Nez Perce Historic Trail**

Approximately two miles of the Nez Perce Historic Trail, a part of the National Historic Trail System, crosses through the planning area north of Winifred. However, within the planning area there are limited opportunities for historic or cultural interpretation since much of the historic trail location is on private land.

#### **3.12.2 Conditions on BLM-Administered Lands**

The BLM manages 593,995 acres within the planning area, and 345,560 acres are located in PPH and PGH areas. Recreation activities on BLM-administered lands are comparable to those that occur in the broader planning area; however, BLM-administered lands within the planning area are widely distributed and largely noncontiguous. This distribution limits recreation opportunities on BLM-administered land. The most popular recreation activity on BLM-administered land in the planning area is hunting, which accounts for the majority of all recreation activities and takes place predominately during the autumn months. Other popular activities include fishing, hiking, and camping.

There are three SRMAs in the planning area: Judith Mountains, Judith River, and Snowy Mountains (see **Figure 3-6**, Recreation Management Areas, in **Appendix A**). **Table 3-38**, Designated SRMAs in the Planning Area, summarizes the acreage of SRMAs that overlap PPH and PGH.

**Table 3-38**  
**Designated SRMAs in the Planning Area**

<b>SRMA</b>	<b>Size (acres)</b>	<b>Area in PPH (acres)</b>	<b>Area in PGH (acres)</b>
Judith Mountains	19,180	0	0
Judith River	10,079	0	9,763 (97%)
Snowy Mountains	75	0	0
<b>Total</b>	<b>29,334</b>	<b>0</b>	<b>9,763 (33%)</b>

Source: BLM 2012a

#### **Judith River Special Recreation Management Area**

The Judith River SRMA is comprised of scattered BLM-administered lands straddling a 27-mile stretch of the Judith River along the northern border of Fergus County. Due to its pristine qualities, this river segment was found to be eligible as part of the Wild and Scenic River System. However, a determination of non-suitability was made in the Judith Resource Area RMP (Appendix I, page

377; BLM 1994). Judith River SRMA is the only SRMA in GRSG habitat; therefore, will be the only SRMA analyzed in this RMPA/EIS.

BLM-administered lands associated with the Judith River SRMA are scattered and represent a fraction of the land area studied as part of the Wild and Scenic River evaluation. The remaining land in the study area is privately owned. Noncontiguous public lands prevent any significant recreational opportunities on BLM-administered land and present recreation management challenges. Most recreation activities in the SRMA are dispersed and occur either on the river (boating and fishing) or directly adjacent to the river (hunting, camping, sightseeing). There are no BLM-administered trails in the SRMA and the scattered distribution of BLM parcels limits public access to the river. Public access to the river is possible at Anderson Bridge via Judith River Road. While the bridge and roadway are public within a public ROW, the properties surrounding the bridge are private. Anderson Bridge is located approximately 10 miles west of Winifred, Montana.

#### **Extensive Recreation Management Areas**

There are 15 ERMAs in the planning area. Of these 15, there are two ERMAs outside GRSG habitat and two others identified in the existing RMPs that are no longer located on BLM-administered lands. All 11 ERMAs located in GRSG habitat within the decision area are in PPH. No ERMAs are located in PGH. ERMAs generally correspond with small reservoirs and provide mainly water-based recreation activities such as fishing, canoeing, and swimming. Each ERMA boundary corresponds with the high water line of the applicable reservoir. Payola Reservoir ERMA is the only ERMA with recreation facilities. At Payola Reservoir, recreation users have access to a cabana, picnic tables, and two fire pits. **Table 3-39**, Designated ERMAs in the Planning Area, summarizes the acreage of ERMAs in the planning area. All ERMAs are located in either PPH or outside the planning area.

**Table 3-39**  
**Designated ERMAs in the Planning Area**

<b>ERMA</b>	<b>Outside Habitat (acres)</b>	<b>Area in PPH (acres)</b>	<b>Area in PGH (acres)</b>
Box Elder/Vogel Reservoir	0	12	0
Buffalo Wallow Reservoir	0	15	0
Crooked Creek Reservoir	0	7	0
Drag Creek Reservoir	36	0	0
Dry Blood Reservoir	0	12	0
Fritzner Reservoir	3	1	0
Holland Reservoir	0	10	0
Jakes Reservoir	0	17	0

**Table 3-39**  
**Designated ERMA in the Planning Area**

<b>ERMA</b>	<b>Outside Habitat (acres)</b>	<b>Area in PPH (acres)</b>	<b>Area in PGH (acres)</b>
Lower Dry Wolf Reservoir	0	6	0
Mauland Reservoir	1	0	0
Payola Reservoir	0	20	0
South Fork Dry Blood Reservoir	0	10	0
Upper Dry Wolf Reservoir	0	5	0
*Hopalong Reservoir	0	0	0
*Yellow Water Reservoir	0	0	0
<b>Total</b>	<b>40</b>	<b>115</b>	<b>0</b>

Source: BLM 2012a

\*Identified as ERMA in Judith Resource Area RMP, but currently no BLM ownership.

#### ***Off-Highway Vehicles***

OHVs are used primarily as a mode of transportation for accessing areas to participate in other recreation activities such as hunting, camping, or fishing. In accordance with the Off-Highway Vehicle Record of Decision and Proposed Plan Amendment for Montana, North Dakota, and Portions of South Dakota, motorized cross-country travel is prohibited in all three states (BLM 2003b). OHVs must therefore remain on existing travel routes at all times.

#### ***Special Recreation Permits***

The BLM uses SRPs to authorize certain commercial, competitive, and group recreation events and activities on BLM-administered lands and related waters. BLM field offices issue SRPs on a discretionary basis. SRPs are one of many tools used by the BLM to implement land use plans, achieve the goals and objectives of the field office's recreation program, manage visitor use, protect resources, and help ensure the health and safety of the visiting public (BLM IM 2011-019, BLM 2010a).

The BLM authorizes SRPs for big game hunting and upland bird hunting in the planning area. These recreation activities are provided by recreation outfitters throughout the LFO. The BLM currently issues seven SRPs in the planning area. Of these, six permits are for big game hunting, and one is for upland bird hunting.

#### **3.12.3 Trends**

Recreation use in the planning area is expected to continue to increase over time. In particular, more dispersed recreation activities (e.g., hunting, fishing, and hiking) are likely to increase because of the region's rural landscape, clean air,

increasing national population and increasing number of local employment opportunities in the energy sector. The number of SRPs issued on an annual basis is expected to remain steady, or increase slightly. Additional factors expected to increase demand for recreation on GRSG habitats in central Montana include:

- Increasing popularity of outdoor recreation as a family-oriented activity
- Increasingly active retired population with more disposable time and income
- Displacement from other recreation areas due to decreasing opportunities or changes in management in those areas
- Increasing importance of recreation as a component of the local economy
- Increasing importance of natural-resource recreation as other areas of the country become more urbanized
- Treatment of noxious/invasive weeds

### 3.13 RANGE MANAGEMENT

The primary laws that govern livestock grazing on public lands are the Taylor Grazing Act of 1934, FLPMA, and the Public Rangelands Improvement Act of 1978. In addition, the BLM manages grazing lands under 43 CFR Part 4100 and applicable policy.

In accordance with 43 CFR 4180, the BLM is required to meet or make progress towards meeting standards defined in the Lewistown District Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997) (see **Appendix F**). Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Guidelines are preferred or advisable grazing management approaches to maintaining or ensuring progress towards achieving land health standards. These standards and guidelines were developed with public input through the processes established by the NEPA. The Judith Resource Area and Headwaters Resource Management Plans were amended by this document upon its approval by the Secretary of the Interior in August 1997. Adherence to the Standards for Rangeland Health and Guidelines for Livestock Grazing Management is also a requirement of BLM grazing regulations as set forth by 43 CFR Section 4180.

The BLM is required to make changes where an allotment is not meeting standards due to current livestock grazing. The LFO assesses grazing allotments in conjunction with the grazing permit/lease renewal process, which occurs every 10 years. An interdisciplinary team of BLM specialists complete the allotment assessments in coordination with the permittees/lessees using the

Interpreting Indicators for Rangeland Health Process, which has been scientifically reviewed through the USGS peer-review process (BLM 2005c).

When the grazing allotment assessment process has been completed, the interdisciplinary team completes allotment evaluation and, if the evaluation indicates that an allotment is not achieving the Standards for Rangeland Health, a determination of what is causing the allotment to not achieve the standards is completed. When it is determined that current livestock grazing management is a causal factor in the allotment on achieving the standards, a change in the grazing management must be initiated within one year in order to allow the grazing allotment to achieve or make significant progress towards achieving the standards.

Changes to allotment management, include, but are not limited to:

- increasing length of rest periods between grazing periods
- changing season of use
- altering livestock turnout location
- changing grazing intensity
- changing grazing duration
- improving livestock distribution

Improved livestock distribution could be achieved through construction of water developments and fences, selective salt and mineral placement, and changes to livestock turnout location and season of use. In some cases, fencing may be used to protect upland and/or riparian areas.

A grazing permit is the document which authorizes livestock grazing use of BLM-administered lands within an established grazing district, whereas a grazing lease is the document which authorizes livestock grazing use of public lands outside an established grazing district as defined by the Taylor Grazing Act (43 CFR 4100.0-5). The kind and number of livestock, the period of use (seasonal), the allotment to be used, and the amount of use in AUMs are mandatory terms and conditions of every grazing permit or lease (43 CFR 4130.3). An AUM is the amount of forage necessary for the sustenance of one cow or its equivalent for one month and an allotment is an area of land designated and managed for grazing of livestock (43 CFR 4100.0-5).

### **3.13.1 Conditions of the Planning Area**

Grazing is permitted throughout the majority of the planning area. Rangeland vegetation in the planning area consists primarily of sagebrush grasslands, grasslands, and lightly vegetated badlands. Mixed shrub communities are common in coulees and benches throughout all of these vegetation types.

Within the planning area, many ranches have grazing leases on state lands that are intermingled with private and public land. Public lands cover approximately eight percent of the planning area.

#### **WAFWA Management Zones I and 4**

**Table 3-40**, Grazing Allotments within GRSG Habitat, through **Table 3-42**, Fences within GRSG Habitat, display data compiled in a BER produced by the USGS and BLM (Manier et. al. 2013). In each table, acres and miles are presented by surface management agency and their occurrence within PGH and PPH in the planning area, and MZs I and IV. The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

On lands of all surface management, there are 1,189,200 acres of grazing allotments, with 609,700 in PGH and 579,500 in PPH as displayed in **Table 3-40**.

**Table 3-40**  
**Grazing Allotments within GRSG Habitat**

Surface Management Agency	Acres within PGH			Acres within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	277,900	4,443,000	4,670,700	229,600	2,982,200	13,408,800
Forest Service	0	510,300	1,050,800	0	291,000	1,566,700
Tribal and Other Federal	78,800	137,200	153,800	3,600	10,600	266,200
Private	218,700	11,338,100	1,201,300	309,800	4,619,800	3,044,600
State	34,300	1,194,300	257,900	36,500	681,000	693,600
Other	0	3,100	400	0	300	1,500

Source: Manier et al. 2013

Current livestock grazing was a significant causal factor for not achieving land health standards in 78 (54 allotments within GRSG habitat) of the 526 allotments within the planning area (**Table 3-41**, Allotments Not Meeting Land Health Standards within GRSG Habitat). See **Section 3.13.2**, Conditions on BLM-Administered Lands, for a detailed description of land health assessments in the LFO.

**Table 3-41**  
**Allotments Not Meeting Land Health Standards within GRSG Habitat**

Surface Management Agency	Acres <sup>1</sup> within PGH			Acres <sup>1</sup> within PPH		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	23,800	52,100	968,900	81,900	82,500	2,617,200

Source: Manier et al. 2013

<sup>1</sup>Only includes allotments not meeting Land Health Standards with grazing as the causal factor

Structural range improvements may present a risk to GRSG, particularly fences, which when not designed with special provisions for GRSG, can cause fence collisions or provide hunting raptors a place to perch. In the planning area, there are approximately 3,900 miles of fence; 1,800 in PGH and 1,900 in PPH (**Table 3-42**).

**Table 3-42**  
**Fences within GRSG Habitat**

Surface Management Agency	Miles within PGH <sup>1</sup>			Miles within PPH <sup>1</sup>		
	Planning Area	MZ I	MZ IV	Planning Area	MZ I	MZ IV
BLM	700	11,300	7,200	700	18,700	16,100
Forest Service	0	900	1,900	0	6,100	2,800
Tribal and Other Federal	100	500	400	0	500	400
Private	900	32,100	3,900	1,100	100	7,400
State	100	3,300	500	100	10,700	1,200
Other	0	0	13	0	1,400	26

Source: Manier et al. 2013

<sup>1</sup>Derived from a dataset that identifies pasture and allotment borders on BLM and Forest Service land as potential fences.

### 3.13.2 Conditions on BLM-Administered Lands

Within the planning area the majority of BLM-administered acreage is open to grazing (570,067 acres, 96.0 percent) (see **Table 3-43**, Lewistown Field Office Planning Area – Grazing Allocation). Approximately 6,780 acres (1.1 percent) of BLM-administered lands within the planning area, all within the Judith Resource Area, are closed to grazing for protection of other resources, including area within Judith Mountains and Square Butte. Approximately 17,148 acres (2.8 percent) of the BLM-administered lands in planning area is unallocated for grazing (BLM 2012a).

**Table 3-43**  
**Lewistown Field Office Planning Area – Grazing Allocation**

<b>RMP</b>	<b>Type</b>	<b>Acres in Non GRSG Habitat</b>	<b>Acres in PPH</b>	<b>Acres in PGH</b>	<b>Total Acres</b>
Judith Resource Area RMP	Open to grazing	225,716 (40%)	230,716 (41%)	106,089 (19%)	562,521
	Closed to grazing	6,780 (100%)	0	0	6,780
Headwaters RMP	Open to grazing	7,186 (95%)	n/a	360 (5%)	7,546
	Closed to grazing	0	0	0	0
<b>Planning Area Total</b>	<b>Open to grazing</b>	<b>232,902 (41%)</b>	<b>230,716 (40%)</b>	<b>106,449 (19%)</b>	<b>570,067</b>
	<b>Closed to grazing</b>	<b>6,780 (100%)</b>	<b>0</b>	<b>0</b>	<b>6,780</b>

Source: BLM 2012a

Currently the BLM manages grazing on 526 grazing allotments in the planning area. Cattle are the most prevalent class of livestock. On GRSG habitat (PPH and PGH), there are all or portions of 207 and 107 allotments respectively (Table 3-44, Lewistown Field Office Planning Area – Summary of Allotments and AUMs by Habitat Type).

**Table 3-44**  
**Lewistown Field Office Planning Area – Summary of Allotments and AUMs by  
Habitat Type**

	<b>Non GRSG Habitat (acres)</b>	<b>PGH (acres)</b>	<b>PPH (acres)</b>	<b>Total</b>
Number of Active AUMS	34,398 (33%)	19,460 (19%)	49,948 (48%)	103,806
Number of Allotments	212 (40%)	107 (21%)	207 (39%)	526

Source: BLM 2012a

A wide range of management approaches are practiced among the permittees/lessees that graze livestock. Some grazing permits/leases are held by producers that are primarily involved in farming. In these cases, livestock are often grazed on BLM-administered land during the summer and on private land stubble fields in the fall and winter. In most cases, isolated tracts of BLM-administered land are grazed in conjunction with private land because the intermingled land ownership pattern and terrain make it difficult to manage the BLM-administered land separately from private land. In other cases, large blocks

of BLM-administered land are authorized to producers that are primarily involved in ranching. The allotments with significant acreages of isolated tracts and larger contiguous blocks of BLM-administered lands are usually managed under grazing prescriptions and/or rotations that are outlined in a watershed plan or an AMP that includes private, state, and BLM-administered land.

Many allotments have range improvements such as fences, stock ponds, pipelines, springs, windmills, seedings, wells, and access roads for livestock management purposes.

Over the past decade, the BLM undertook a field office-wide planning effort, focused on implementing decisions in the 1994 Judith Resource Area Resource Management Plan. As part of this effort, grazing allotments were assessed as to whether or not Range Land Health Standards were being achieved and Guidelines for Livestock Grazing Management were being followed. Environmental assessments were prepared for the following plans relevant to the planning area:

- Petrolia Watershed Plan Environmental Assessment (BLM 2007b)
- North-East Fergus Watershed Area Plan Environmental Assessment (BLM 2009b)
- Musselshell Breaks Watershed Plan Environmental Assessment (BLM 2005d)
- Upper Arrow Creek Watershed Area Plan Environmental Assessment (BLM 2008d)
- Great Falls Area Grazing Lease Renewal Environmental Assessment (BLM 2011b)
- Snowies/Little Belts Grazing Lease Renewal Environmental Assessment and Permit Renewal EA (BLM 2009c)
- Forest Health and Vegetation Management for the Judith and Moccasin Mountains (BLM 2006)

Details for each watershed area are provided in the applicable environmental assessment (EA) and summarized in **Table 3-45**, Lewistown Field Office Planning Area – Land Health Assessment, below. An assessment of rangeland health standards and guidelines has been made on all allotments in the planning area. Allotments have been assessed for adherence to the Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM for Montana and the Dakotas (**Appendix F**).

**Table 3-45  
Lewistown Field Office Planning Area – Land Health Assessment**

<b>Type</b>	<b>Acres (Allotments) in Non GRSG Habitat</b>	<b>Acres (Allotments) in PGH</b>	<b>Acres (Allotments) in PPH</b>	<b>Total Acres (Allotments)</b>
Total assessed for land health standards	232,902 (212)	230,716 (207)	106,449 (107)	570,067 (526)
Meeting land health standards	159,052 (121)	105,836 (124)	68,736 (78)	333,625 (323)
Not meeting land health standards	73,848 (91)	124,881 (83)	37,713 (29)	236,427 (203)
Not meeting land health standards due to livestock grazing	38,418 (24)	91,878 (48)	13,559 (6)	143,856 (78)
Not meeting land health standards due to livestock; appropriate action taken to ensure significant progress toward meeting the standards	38,418 (24)	91,878 (48)	13,559 (6)	143,856 (78)
Not assessed	0	0	0	0

Source: BLM 2012a

Current livestock grazing was a significant causal factor for not achieving land health standards in 78 (54 allotments within GRSG habitat) of the 526 allotments within the planning area. On 92,571 acres, current livestock grazing was not a causal factor for failing to achieve all standards and guidelines. For all allotments determined to not be achieving standards due to current livestock grazing management, changes in livestock grazing management were implemented through changes in the mandatory and/or other terms and conditions of the grazing permits or leases by grazing decision in accordance with BLM grazing regulations (43 CFR 4160) and analyzed in the EAs listed above. The management changes implemented included, but were not limited to, vegetative treatments (including the treatment of noxious weeds), construction of range improvement projects (i.e., fences, water developments, including pipelines, reservoirs/pits, and spring developments), the implementation of grazing rotations, reductions in authorized AUMs, and suspension of authorized AUMs. The effectiveness of the management changes implemented will be evaluated on a 10-year cycle, based on the dates of the watershed plans listed above. As of the current time, none of the allotments have been reassessed to determine if the changes implemented have resulted in allotments that were not achieving standards to meet or make significant progress.

The LFO renews term grazing permits and leases through the completion of sub-landscape level NEPA analysis in the form of EAs. The EAs are undertaken after land health evaluations and as necessary land health determinations have been completed, in accordance with BLM policy and regulation. **Figure 3-7, Resource Activity Plans – Grazing Authorization Renewal Areas, in Appendix A** illustrates the sub-landscape level resource activity planning areas that are used to renew grazing authorizations (permits and leases) as well as analyze other actions and projects that may be completed to achieve BLM priorities and mission goals associated with other programs. These planning areas have been delineated based on BLM administrative, Cooperative State Grazing District (CSGD) and watersheds boundaries, as well as other factors that allow LFO to meet the requirement of BLM grazing regulations 43 CFR 4160, 4180 and policy as it relates to grazing authorization renewal, land health standards and most efficiently complete BLM's mission based on LFO staffing levels.

The list below shows the priority order for grazing authorization renewal for the planning units within LFO; the renewal process for the Crooked Creek Plan will be completed in 2013 and therefore has been moved to the bottom of the priority list. The land health assessment process for the Crooked Creek Plan will be completed in 2013 in accordance with Washington Office IMs WO-2012-043 and 044, which provide guidance on GRSG management and conservation. The remaining planning units would be completed as listed by priority by 2023. The planning units listed below contain PPH and PGH unless noted otherwise.

- Judith
- Lower Missouri
- Petrolia
- SE Fergus County
- Upper Missouri
- Section 15 (no PPH)
- Great Falls (no PPH)
- Crooked Creek

### 3.13.3 Trends

Permitted use levels have been assessed in watershed EAs and grazing management changes recommended as needed to work towards achieving livestock grazing standards. In some cases, permitted AUMs for individual allotments have been reduced. Actual use of allotments has decreased in many areas over the past decade as a result of drought. Changes in land use on private and public lands, such as increased use for recreational purposes, have also influenced livestock grazing.

Drought has influenced the condition of vegetation in some areas. Noxious weeds are a serious threat to the planning area. Within the Petrolia Watershed Area, where the majority of PPH is located, higher concentrations of weed infestations are present along the major drainages and their tributaries, including Ford's Creek, Box Elder Creek, Pike Creek, Buffalo Creek, Duck Creek, and the Musselshell River. The largest areas of infestation noted within PPH and PGH are Leafy spurge, spotted knapweed, Russian knapweed, Whitetop (Hoary cress), and Houndstongue. Many invasive weed species are unpalatable to livestock, which may over time decrease total productivity or result in the need to alter grazing management practices.

One program underway to restore vegetation for livestock and GRSG use on private lands is the West-wide National Resource Conservation Service (NRCS) Sage-Grouse Initiative (SGI), which is cooperatively working with ranchers to boost both livestock and grouse productivity (NRCS 2011).

Recently, land sales for recreational purposes have increased, primarily for private hunting. This trend often results in the private lands associated with ranches being sub-divided into smaller properties that may or may not have BLM grazing privileges. The new owners often sub-lease the newly divided ranch, including BLM-administered grazing privileges for grazing, and recreate on the ranch property. The trend of recreational land sales is likely to increase as long as the economy remains relatively stable and may result in changes to administration needs by the BLM if the number of grazing permits/leases changes.

### **3.14 AREAS OF CRITICAL ENVIRONMENTAL CONCERN**

ACECs are defined in FLPMA and in 43 USC 1702(a) and 43 CFR 1601.0-5(a) as areas where special management attention is required to protect and prevent irreversible 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 intent of Congress in mandating the designation of ACECs was to give priority to the designation and protection of areas containing unique and significant resource values. ACECs are areas within BLM-administered lands where special management attention is required to protect or to prevent irreparable damage to relevant values. These values identified in the ACEC nomination process must meet a set of importance criteria (BLM 1988). The value, resource, process or natural system, or hazard present must have one or more of the following:

- More than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern
- Qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change

- Recognition as warranting protection in order to satisfy national priority concerns or to carry out mandates of FLPMA
- Qualities that warrant highlighting in order to satisfy public or management concerns about safety and public welfare
- Qualities that pose a significant threat to human life and safety or to property

An ACEC must also require special management attention to protect the identified relevant and important values. Special management attention refers to management prescriptions that are developed during preparation of an RMP or RMPA expressly to protect relevant and important values of an area from the potential effects of actions permitted by the RMP. These are management measures that would not be necessary and prescribed if the critical and important features were not present (BLM 1988). ACECs are areas where natural processes are allowed to predominate and that are preserved for the primary purposes of research and education.

#### **3.14.1 Conditions of the Planning Area**

The Acid Shale-Pine Forest ACEC is the only ACEC in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area that is also within GRSG habitat. The ACEC comprises 2,463 acres on two separate BLM tracts: 1,646 acres in the Briggs Coulee tract and 817 acres in the War Horse tract. The ACEC is generally located northeast of the community of Grass Range; its boundary is entirely within PPH (see **Figure 3-8**, Areas of Critical Environmental Concern, in **Appendix A**).

The Square Butte ACEC, Judith Mountains Scenic Area ACEC, and Collar Gulch ACEC are also located in the planning area, but are located outside GRSG habitat.

#### **3.14.2 Conditions on BLM-Administered Lands**

##### ***Acid Shale-Pine Forest ACEC***

Designation of the Acid Shale-Pine Forest as an ACEC/Research Natural Area signified the need to research the effects of grazing, fire, and other activities on the landscape and to protect unique resources in the area from potentially harmful activities. The Acid Shale-Pine Forest's fragile shale landscape is vulnerable to erosion from man-made surface disturbances and natural weather events such as heavy rain storms. The BLM management objectives for the Acid Shale-Pine Forest ACEC are intended to protect the area's unique pine forest and shale landscape. Vegetation in the ACEC is limited mostly to slow-growing ponderosa pine trees, with a sparse distribution of juniper bushes and grasses in the understory. Dense clay soil beneath the pine trees prevents a more robust understory vegetative community from becoming established. The vegetative communities that comprise shale-pine forest landscapes are unique and appear to be confined to central and eastern Montana.

Due to the lack of low-lying vegetative cover and fragile soil conditions, wind and water soil erosion is common in shale-pine forest landscapes. Where the topography becomes steep, deep gullies carve into the landscape. Any improper surface-disturbing activities, such as grazing, mineral exploration, motorized vehicle use, or recreation, would exacerbate soil erosion. The geology composition may make the ACEC attractive for oil and gas exploration.

PPH is found within the entire Acid Shale-Pine Forest ACEC. Although shrub and grass vegetation more typical of GRSG habitat is generally sparse within the ACEC, openings between pine trees provide more opportunities for shrubs, forbs, and grasses to become established. These areas provide food and shelter for wildlife and, in some cases, provide the proper landscape for species reproductive activities (BLM 1992 p135-136).

Motorized travel in the ACEC is limited to existing routes and trails. In addition, the ACEC is managed as a ROW avoidance area. Timber harvest is prohibited, and the ACEC is closed to fluid minerals leasing.

#### **3.14.3 Trends**

The BLM would continue to analyze and consider designating BLM-administered lands as ACECs where special management attention is required to protect or to prevent irreparable damage to relevant values, as necessary.

### **3.15 AIR RESOURCES**

Air resources include air quality and air quality related values. As part of the planning and decision-making process, the BLM considers and analyzes the potential effects of BLM and BLM-authorized activities on air resources.

The US Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including criteria air pollutants subject to National Ambient Air Quality Standards (NAAQS). Pollutants regulated under NAAQS include carbon monoxide (CO), lead, nitrogen dioxide (NO<sub>2</sub>), ozone, particulate matter with a diameter less than or equal to 10 microns (PM<sub>10</sub>), particulate matter with a diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>). Two additional pollutants, nitrogen oxides and volatile organic compounds are regulated because they form ozone in the atmosphere. Air quality is determined by pollutant emissions and emission characteristics, atmospheric chemistry, dispersion meteorology, and terrain. Air quality related values include effects on soil and water, such as sulfur and nitrogen deposition and lake acidification, and aesthetic effects, such as visibility.

In addition to EPA federal regulations, air quality is regulated by the MTDEQ. This agency develops state-specific regulations and issues air quality permits to emission sources.

### 3.15.1 Conditions of the Planning Area

There are no state-operated ambient air quality monitors in the planning area. Consequently, data used in this analysis are data from monitors east and west of the planning area.

The closest monitoring station to the planning area is in Cascade County; however, this station only has three years of monitoring data for CO and one year of monitoring data for PM<sub>2.5</sub>. The closest monitoring stations with three years of data are located in Lewis and Clark County, west of the planning area, and Richland County, east of the planning area. Based on available data collected from these monitoring sites between 2009 and 2011, all monitored criteria pollutant values were below the NAAQS, except values for PM<sub>2.5</sub>. High particulate concentrations in Lewis and Clark County are attributed to wood burning in Helena during the winter. A study conducted by the University of Montana found wood burning to be responsible for nearly two-thirds of winter particulate pollution (Ward 2008). However, the data from the Richland County monitor outside of Sidney, Montana, is more representative of PM<sub>10</sub> and PM<sub>2.5</sub> concentrations within GRS habitat areas than the Helena data from Lewis and Clark County.

**Table 3-46**, Air Quality Monitor Values Near the Planning Area (2009-2011)\*, shows the concentrations of monitored pollutants in the latest three years for which data has been finalized in Richland, Lewis and Clark, and Cascade Counties.

**Table 3-46**  
**Air Quality Monitor Values Near the Planning Area (2009-2011)\***

Criteria Pollutant	Averaging Time	2009 <sup>1</sup>	2010 <sup>1</sup>	2011 <sup>1</sup>	3-year average	NAAQS	% of NAAQS
<b>Richland County</b>							
NO <sub>2</sub>	1 hour	10	9	9	9.3	100 ppb	9.3%
CO <sup>3</sup>	1 hour	-	-	-	-	35 ppm	-
Ozone	8 hours	0.058	0.057	0.052	0.056	0.075 ppm	75%
SO <sub>2</sub>	1 hour	-	6	6	-	75 ppb	8%
PM <sub>2.5</sub> <sup>2</sup>	24 hours	12	15	15	14	35 µg/m <sup>3</sup>	40%
PM <sub>10</sub> <sup>2</sup>	24 hours	100	85	102	95.6	150 µg/m <sup>3</sup>	64%
<b>Lewis and Clark County</b>							
CO	1 hour	-	-	0.5	-	35 ppm	1.4%
Ozone	8 hours	-	-	0.057	-	0.075 ppm	76%
SO <sub>2</sub>	1 hour	-	-	1	-	75 ppb	1.3%
PM <sub>2.5</sub> <sup>2</sup>	24 hours	19, 21, 34	54	10, 41	-	35 µg/m <sup>3</sup>	119% <sup>4</sup>
<b>Cascade County</b>							
PM <sub>2.5</sub> <sup>2</sup>	24 hours	14	-	-	-	-	-

**Table 3-46  
Air Quality Monitor Values Near the Planning Area (2009-2011)\***

Criteria Pollutant	Averaging Time	2009 <sup>1</sup>	2010 <sup>1</sup>	2011 <sup>1</sup>	3-year average	NAAQS	% of NAAQS
CO	1 hour	11.7	11.7	1.9	8.4	35 ppm	24%
CO	8 hours	2.8	2.8	0.9		9 ppm	24%

Source: EPA 2012a

\* Exceptional events data included.

<sup>1</sup> Monitored concentrations are the maximum second highest for 24-hour PM<sub>10</sub>; 4th highest daily maximum for 8-hour O<sub>3</sub>; 98<sup>th</sup> percentile for 24-hour PM<sub>2.5</sub> and 1-hour NO<sub>2</sub>; 99<sup>th</sup> percentile for 1-hour SO<sub>2</sub>; and maximum arithmetic mean for annual PM<sub>2.5</sub>.

<sup>2</sup> Data from multiple monitoring stations.

<sup>3</sup> Pollutant not monitored at this station.

<sup>4</sup> Average values monitored for each year to determine 3-year average.

The EPA classifies areas of the US according to whether they meet the NAAQS. Areas that violate air quality standards are designated as nonattainment areas for the relevant criteria air pollutants. Areas that comply with air quality standards are designated as attainment areas for the relevant criteria air pollutants. Areas that have been redesignated from nonattainment to attainment are considered maintenance areas. The planning area is in attainment for all of the NAAQS (MTDEQ 2011).

Air quality also may be assessed using the EPA's air quality index (AQI). The AQI is an index used for reporting daily air quality to the public. The index tells how clean or polluted an area's air is and whether associated health effects might be a concern. The EPA calculates the AQI for five criteria air pollutants regulated by the Clean Air Act: ground-level ozone, particulate matter, CO, SO<sub>2</sub>, and NO<sub>2</sub>. An AQI value of 100 generally corresponds to the primary NAAQS for the pollutant. The following terms help interpret the AQI information:

- **Good** – The AQI value is between 0 and 50. Air quality is considered satisfactory and air pollution poses little or no risk.
- **Moderate** – The AQI is between 51 and 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.
- **Unhealthy for Sensitive Groups** – When AQI values are between 101 and 150, members of “sensitive groups” may experience health effects. These groups are likely to be affected at lower levels than the general public. For example, people with lung disease are at greater risk from exposure to ozone, while people with either lung disease or heart disease are at greater risk from

exposure to particle pollution. The general public is not likely to be affected when the AQI is in this range.

- **Unhealthy** – The AQI is between 151 and 200. Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
- **Very Unhealthy** – The AQI is between 201 and 300. This index level would trigger a health alert signifying that everyone may experience more serious health effects.

The AQI of Lewis and Clark County, Cascade County, and Richland County are displayed in **Table 3-47**, Air Quality Index Report, 2009-2011. In general the air quality in these areas has consistently been good for the past three years (EPA 2012b).

**Table 3-47**  
**Air Quality Index Report, 2009-2011**

Year	Number of Days with AQI data	Number of Days Rated Good	Percent of Days Rated Good	Number of Moderate Days	Number of Unhealthy for Sensitive Groups Days	Number of Unhealthy or Very Unhealthy Days
<b>Lewis and Clark County (west of the planning area)</b>						
2011	365	340	93%	24	1	0
2010	360	306	85%	45	8	1
2009	358	331	92%	25	2	0
<b>Total:</b>	<b>1,083</b>	<b>977</b>		<b>94</b>	<b>11</b>	<b>1</b>
<b>Average:</b>			<b>90%</b>	<b>9%</b>	<b>1%</b>	<b>0%</b>
<b>Cascade County (west of the planning area)</b>						
2011	347	325	94%	22	0	0
2010	365	340	93%	25	0	0
2009	365	344	94%	21	0	0
<b>Total:</b>	<b>1,077</b>	<b>1,009</b>		<b>68</b>	<b>0</b>	<b>0</b>
<b>Average:</b>			<b>94%</b>	<b>6%</b>	<b>0%</b>	<b>0%</b>
<b>Richland County (east of the planning area)</b>						
2011	365	336	92%	29	0	0
2010	365	345	95%	20	0	0
2009	365	343	94%	22	0	0
<b>Total:</b>	<b>1,095</b>	<b>1,024</b>		<b>71</b>	<b>0</b>	<b>0</b>
<b>Average:</b>			<b>94%</b>	<b>6%</b>	<b>0%</b>	<b>0%</b>

Source: EPA 2012b

Air quality related values include visibility, which can be degraded by regional haze due primarily to sulfur, nitrogen, and particulate emissions. Since 1980, the Interagency Monitoring of Protected Visual Environments (IMPROVE) network has measured visibility in national parks and wilderness areas. The nearest IMPROVE site is in the UL Bend Wilderness adjacent to the northeastern edge of the planning area. Visibility at this IMPROVE station has improved slightly in the 2005 to 2009 time period compared with the 2000-2004 time period on both the 20 percent haziest days and the 20 percent clearest days (Hand 2011).

Atmospheric deposition refers to processes in which air pollutants are removed from the atmosphere and deposited into terrestrial and aquatic ecosystems. Air pollutants can be deposited by either wet precipitation (via rain or snow) or dry (gravitational) settling of particles and adherence of gaseous pollutants to soil, water, and vegetation. Much of the concern about deposition surrounds the secondary formation of acids and other compounds that can contribute to acidification of lakes, streams, and soils and affect other ecosystem characteristics, including nutrient cycling and biological diversity. Deposition varies with precipitation and other meteorological variables such as temperature, humidity, winds, and atmospheric stability.

The National Atmospheric Deposition Program/National Trends Network is an interagency sponsored network of monitoring stations that measures wet atmospheric deposition. The Clean Air Status and Trends Network is an interagency network of monitoring stations managed by EPA that measures dry deposition. The closest National Atmospheric Deposition Program/National Trends Network sites are in Havre, north of the planning area, and in Clancy, west of the planning area. There are no Clean Air Status and Trends Network sites near the planning area; the nearest sites are in Glacier National Park and Theodore Roosevelt National Park.

**Table 3-48**, Annual Average Deposition (2009-2011), shows the deposition levels of sulfates, nitrates, and ammonium, as well as pH and precipitation, from 2009 to 2011. The annual average precipitation pH between 2009 and 2011 was 5.56 at the Havre site and 5.40 at the Clancy site; normal rain has a pH level of 5.6, while acid rain has a pH level around 4.3 (EPA 2012c).

There are no Class I areas within the planning area. The closest Class I area is the UL Bend Wilderness, adjacent to the northeastern edge of the planning area. The Gates of the Mountains Wilderness Area in Lewis and Clark County is west of the planning area and is also in close proximity to the planning area. The land in the planning area is designated as Class II.

**Table 3-48  
Annual Average Deposition (2009-2011)**

Year	pH	Precipitation (cm)	Annual Average Wet Deposition (kg/ha/yr)		
			SO <sub>4</sub>	NO <sub>3</sub>	NH <sub>4</sub>
<b>Havre, MT (MT98)</b>					
2009	5.60	26.1	0.69	0.65	0.41
2010	5.49	38.6	0.32	0.55	0.24
2011	5.58	27.8	0.45	0.70	0.43
Average	5.56	30.8	0.49	0.63	0.36
<b>Clancy, MT (MT07)</b>					
2009	5.35	38.5	0.29	0.42	0.15
2010	5.43	42.9	0.25	0.45	0.16
2011	5.43	44.9	0.25	0.40	0.18
Average	5.40	42.1	0.26	0.42	0.16

Source: NADP/NTN 2009-2011

SO<sub>4</sub>=sulfates; NO<sub>3</sub>=nitrates; NH<sub>4</sub>=Ammonium

### 3.15.2 Conditions on BLM-Administered Lands

The area managed by the BLM is in compliance with all NAAQS (MTDEQ 2011). The Richland and Cascade County monitoring locations are the most representative air quality monitors for the BLM-administered lands in the planning area. As such, these monitoring locations have the best estimate to what kind of air quality is present in the planning region, and more specifically, on BLM-administered lands. The conditions on BLM-administered lands are similar to those discussed in **Section 3.15.1**, Conditions of the Planning Area.

### 3.15.3 Trends

Quantitative data provided by the Richland and Cascade County monitors show air quality near the planning area has been good over the past several years (EPA 2012a). Based on the proximity of these monitoring sites to the planning area, and on past trends for air quality, it is reasonable to assume the air quality in the planning area will remain good. Measures that are implemented to protect GRSG may also benefit air resources if they prohibit surface disturbance or reduce access to habitat, consequently limiting fugitive dust or pollution caused by transportation.

The good air quality in the area is largely attributed to the rural nature of the planning region. In the event that more development occurs in the future, air quality may be affected.

Visibility trend plots at the UL Bend Wilderness IMPROVE site shows slight improvements in visibility on both the 20 percent haziest and 20 percent

clearest days since the early 2000s (Hand 2011). Trend plots at National Atmospheric Deposition Program/National Trends Network monitoring sites MT2007 and MT98 likewise show SO<sub>2</sub>, NO<sub>3</sub>, and NH<sub>4</sub> deposition rates to be generally stable since the early 2000s (NADP/NTN 2012).

### 3.16 CLIMATE

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and persist for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity” (IPCC 2007). Climate change and climate science are discussed in detail in the *Climate Change Supplementary Information Report for Montana, North Dakota, and South Dakota, Bureau of Land Management* (BLM 2010b). This document is often referred to as the “Climate Change SIR” and is incorporated by reference into the Lewistown Field Office Greater Sage-Grouse RMPA/EIS.

Earth has a natural greenhouse effect, wherein naturally occurring gases such as water vapor, carbon dioxide, methane, and nitrous oxide absorb and retain heat. Without the natural greenhouse effect, the earth would be approximately 60°F cooler (BLM 2010b). Climate change is caused in part by the increase in GHGs in the atmosphere beyond naturally occurring levels<sup>1</sup>. Over time the amount of energy sent from the sun to the Earth’s surface should be approximately the same as the amount of energy radiated back into space, leaving the temperature of the Earth’s surface roughly constant. Increased levels of GHGs trap more heat in the atmosphere rather than allowing it to escape back into space.

Climate models predict that if GHGs continue to increase, the average temperature at the Earth’s surface could increase from 3.2 to 7.2°F (1.8 to 4.0°C) above 1990 levels by the end of this century (EPA 2011b). An increase in the average temperature of the Earth may produce changes in sea levels, rainfall patterns, and intensity and frequency of extreme weather events. The IPCC, in its Fourth Assessment Report, stated that warming of the earth’s climate system is unequivocal and that warming is very likely due to anthropogenic (human-caused) GHG concentrations (IPCC 2007).

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<sup>1</sup> There are six GHGs tracked by the IPCC: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (State Department 2010). The latter three gases are known as high global warming potential gases due to their warming effectiveness (140 to 23,900 times greater than carbon dioxide) and their long atmospheric lifetimes (between 1-50,000 years) (EPA 2013). Carbon dioxide, methane, and nitrous oxide have both natural and human-generated sources, while high global warming potential gases are strictly human-generated from various industrial processes. GHGs are tracked as carbon dioxide equivalents, with one gram of carbon dioxide molecule counting as one and other GHG molecules counting as some multiple (EPA 2012d).

### 3.16.1 Conditions of the Planning Area

#### ***Climate***

The planning area has a semiarid continental climate marked by cold winters, warm to rarely hot summers, winds primarily from the west, and abundant sunshine.

The average temperature in central Montana over the last thirty years is between 40°F and 50°F. The average January temperature is around 23°F. The average July temperature is about 66°F, though temperatures as high as 110°F have been recorded (Western Regional Climate Center 2012).

Average annual precipitation ranges from 11 inches to 22 inches, with an average of 15 inches of precipitation (Western Regional Climate Center 2012).

Snow in the mountain areas may be several feet deep. On the plains, snow more than 12 inches deep is uncommon but not rare. Snow generally falls between November and April, although traces have been reported at Lewistown in July and August.

Rainfall is concentrated between April and June. Precipitation from July through September is characterized by localized intense thunderstorms that can drop more than an inch of rain or hail on a small area in a few minutes. Low humidity, high temperatures, and moderate to strong winds cause rapid loss of soil moisture (Western Regional Climate Center 2013).

#### ***Greenhouse Gas Emissions***

GHG emissions are generally reported at national and statewide levels. Montana's GHG emissions were inventoried by the state in 2005 (Montana Climate Change Advisory Committee 2007). In 2005, activities in Montana accounted for approximately 37 million metric tons of carbon dioxide equivalents gross emissions, approximately 0.6 percent of total US GHG emissions. Montana's gross emissions increased 11 percent from 1990 to 2004, while national emissions rose by 15 percent during this period.

Electricity use, agriculture, and transportation are Montana's principal GHG emissions sources. Together, the combustion of fossil fuels for electricity generation used in-state and in the transportation sector account for about 46 percent of Montana's gross emissions. The contribution of agriculture-related GHG emissions is much higher in Montana (26 percent) than in the nation as a whole (seven percent). The state also has higher levels of emissions from the fossil fuels industry—natural gas, oil products, and coal—than the national average (Montana Climate Change Advisory Committee 2007).

### 3.16.2 Conditions on BLM-Administered Lands

Conditions on BLM-administered lands are similar to those described above for the planning area.

### 3.16.3 Trends

Climate changes over the past 100 years are well documented, and climate change is expected to continue into the future. Fossil fuel combustion and other human-caused GHG-producing activities are ongoing, although public awareness and future regulations may reduce annual GHG emissions. Due to the long atmospheric lifetimes of most GHGs, climate change impacts will continue to increase for many years after GHG emissions decrease (EPA 2012d).

Over the past 100 years, annual temperature and precipitation have increased, and climate models predict that they will continue to increase through the 21st century. Extreme weather events such as severe drought and intense rainfall are expected to increase in frequency in the future as well (NCSL 2008).

Depending on the model, in Montana temperatures are predicted to increase 3 to 4°F by the mid-21st century and 5 to 6°F by the end of the century (USGCRP 2009). Precipitation is expected to increase during winter and spring, decrease slightly in the summer, and remain relatively unchanged in the fall (USGCRP 2009). Annual median runoff is expected to decrease between two and five percent (USGCRP 2009). Temperature increases may increase crop yields, which may encourage parts of the state not previously used for agriculture to be obtained for that purpose (NRC 2010). The risk of wildfire is expected to increase throughout the state (NRC 2010).

## 3.17 SOIL RESOURCES

Soil processes determine, to a large extent, the structure and function of ecosystems. Soil health is integral to the BLM's mandate to sustain the health, diversity, and productivity of BLM-administered lands.

The existing Headwaters Resource Management Plan has the following objective related to soils:

- Soils will be managed to maintain productivity and to minimize erosion.

The existing Judith Resource Area Resource Management Plan has the following objective related to soils:

- The BLM will maintain or improve soil productivity by increasing vegetation cover and reducing erosion.

Soil type and quality, along with climate, determine whether sagebrush can grow in a given location, and can determine the type or variety of sagebrush community that is able to thrive. Among other factors, the presence of GRSG is dependent upon the presence of sagebrush. Due to sagebrush type and viability being dependent on soil type and quality, soils are an important element to GRSG habitat.

### 3.17.1 Conditions of the Planning Area

In the portion of the planning area covered by the Judith Resource Area Resource Management Plan, soils are derived from glacial till, sedimentary or igneous bedrock, and alluvium from mixed rock sources. This creates complex and diverse soil patterns, varying greatly in character capability, limitations and productivity. This diversity in soils is reflected in the four Physiographic Provinces that occur across the Judith Resource Area Resource Management Plan portion of the Planning Area (BLM 1992). These four Physiographic Provinces are described below.

Soils located in the Glacial Till Upland Province formed during several periods of late Wisconsin glaciation and are found on landscapes that range from nearly level to gently rolling and from strongly rolling to steep, particularly along drainage-ways. The soils are commonly loamy or clayey till soils, with the clayey soils sometimes being poorly drained. Erosion hazards vary in the Glacial Till Upland Province, but are generally slight to moderate due to the gently rolling topography and short slopes. When disturbed or cultivated, erosion hazards increase, especially wind erosion hazards (BLM 1992).

Soils in the Sedimentary Uplands Province are composed of mostly clayey soils weathered from calcareous and acid shales, but loamy and sandy sedimentary uplands are also common. The soils in this province are usually fragile and highly erosive because of steep slopes and extreme physical properties such as high clay or salt content, slow permeability, relatively shallow depth to bedrock, and sparse vegetation ground cover. Wind and water erosion susceptibility is increased when vegetation ground cover is sparse. Due to the fragile nature of the soils in this portion of the planning area, they are highly susceptible to compaction, severe rutting, and erosion, caused by vehicular travel (BLM 1992).

The Alluvial Soils Province contains deep, clayey, loamy, and sandy soils in valley bottoms, valley sides, and slopes and upland terraces, with local areas that have rock fragments throughout the soil or in the underlying parent material. These soils have high vegetation production potential and are therefore used by livestock and wildlife, particularly near water sources. Soils with high clay contents in these areas are especially susceptible to compaction, which results in reduced water infiltration, which then leads to increased surface water runoff and associated erosion (BLM 1992).

The Mountains and Foothills Province is composed primarily of loamy and clayey soils that range from shallow to deep, and generally have rock fragments throughout the soil. The soils are found on bedrock ridges and on footslopes that form a rolling to very steep terrain with areas of bedrock and talus. Erosion hazards here are slight to high, and compaction susceptibility is moderate to high (BLM 1992).

The Headwaters Resource Management Plan notes that soil data is incomplete for the Meagher County, which is the only portion of the planning area covered

by this RMP. This data is still unavailable from the NRCS (it is in the publishing phase at this time of writing); however, GIS mapping provided the major soil orders in the planning area, described below.

Soils are categorized into 12 orders that are based on the conditions under which the soil develop, with each order having specific inherent soil properties. NRCS data indicates that entisols, mollisols, and vertisols are the predominate soils of the planning area. Entisols are often classified as young soils, or soils that are characterized by little to no soil horizon (layer) development, and poor surface nutrient or organic content. Soil characteristics of Mollisols include dark colored soils with high base chemical content (as opposed to acidic content), high mineral content, and a nutrient enriched surface layer (A horizon). Vertisols are clayey soils that often swell when moistened and shrink when dry, resulting in characteristic cracks in the soil through at least part of the year (NRCS 1999).

Soil orders that comprise the remaining portions of the planning area include Alfisols, Inceptisols, and Aridisols. Alfisols are characterized by a thin or light surface horizon that is rich in nutrients, and often have a clayey subsurface horizon. Inceptisols commonly occur in areas of active erosion, such as slopes, and as a result are characterized by poorly developed soil layers or horizons, with thin surface layers that often have little organic content. Aridisols are characterized by a low water holding potential or capacity, and can have high salt contents (NRCS 1999).

### 3.17.2 Conditions on BLM-Administered Lands

Soil classifications and interpretations on BLM-administered land are provided through a series of tables that breakdown the planning area into dominant soil orders, NRCS farmlands, acreage with sensitive soils, and soil restoration potential classes.

**Table 3-49**, Dominant Soil Order on BLM-Administered Lands, provides acreage numbers for soils within the BLM-administered lands that occur within the planning area (see **Figure 3-9**, Major Soil Orders, in **Appendix A**).

**Table 3-49**  
**Dominant Soil Order on BLM-Administered Lands**

<b>Headwaters</b>	<b>Total (acres)</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
Alfisols	313	0	13 (4%)
Entisols	139	0	60 (43%)
Inceptisols	1,138	0	3 (0.3%)
Mollisols	4,330	0	265 (6%)
Undefined	1,961	0	70 (4%)

**Table 3-49**  
**Dominant Soil Order on BLM-Administered Lands**

<b>Headwaters</b>	<b>Total (acres)</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
<b>Judith Resource Area</b>			
	<b>Acres</b>	<b>PPH</b>	<b>PGH</b>
Alfisols	48,771	34,511 (71%)	1,612 (3%)
Aridisols	24,538	21,078 (86%)	2,034 (8%)
Entisols	312,956	88,252 (28%)	79,429 (25%)
Inceptisols	44,228	12,430 (28%)	8,652 (20%)
Mollisols	76,952	29,934 (39%)	9,193 (12%)
Vertisols	63,876	42,919 (67%)	6,044 (9%)
Undefined	14,773	4,093 (28%)	4,933 (33%)

Source: BLM 2012a

NRCS farmlands on BLM-administered and private lands within the planning area are shown in **Table 3-50**, NRCS Farmlands on BLM-Administered Lands, and in **Figure 3-10**, NRCS Farmland Classification, in **Appendix A**.

**Table 3-50**  
**NRCS Farmlands on BLM-Administered Lands**

<b>Headwaters</b>	<b>BLM (acres)</b>	<b>BLM PPH (acres)</b>	<b>BLM PGH (acres)</b>	<b>Private (acres)</b>	<b>Private PPH (acres)</b>	<b>Private PGH (acres)</b>
Prime	200	0	0	37,180	0	16,860 (45%)
Statewide Importance	270	0	10 (4%)	77,120	0	36,710 (48%)
Not Primeland	15,740	0	420 (3%)	815,110	0	577,740 (71%)
Prime if Irrigated	70	0	0	24,550	0	14,670 (60%)
<b>Judith Resource Area</b>						
	<b>BLM (acres)</b>	<b>BLM PPH (acres)</b>	<b>BLM PGH (acres)</b>	<b>Private (acres)</b>	<b>Private PPH (acres)</b>	<b>Private PGH (acres)</b>
Prime	800	250 (31%)	150 (19%)	341,230	1,950 (0.5%)	13,780 (4%)
Statewide Importance	49,330	15,880 (32%)	7,120 (49%)	801,220	104,780 (13%)	85,280 (11%)
Not Primeland	560,720	210,960 (38%)	102,660 (18%)	3,974,740	1,071,280 (27%)	552,210 (14%)

**Table 3-50**  
**NRCS Farmlands on BLM-Administered Lands**

<b>Headwaters</b>	<b>BLM (acres)</b>	<b>BLM PPH (acres)</b>	<b>BLM PGH (acres)</b>	<b>Private (acres)</b>	<b>Private PPH (acres)</b>	<b>Private PGH (acres)</b>
Prime if Irrigated	18,270	6,130 (34%)	1,960 (11%)	324,630	29,960 (9%)	59,570 (18%)

Source: BLM 2012a

Sensitive soils on BLM-administered lands and BLM sub-surface administered lands within the planning area are shown in **Table 3-51**, Sensitive Soils in the Planning Area. Sensitive soils in the planning area are classified as soils that are susceptible to water erosion and soils that have low restoration potentials. The planning area does not have soils susceptible to wind erosion.

**Table 3-51**  
**Sensitive Soils in the Planning Area**

<b>Land Status</b>	<b>Acreage with Severe Water Erosion Potential</b>	<b>Acreage with Low Soil Restoration Potential</b>
BLM	179,431	73,388
Department of Defense	2	0
USFWS	25,327	5,872
Private	720,505	403,104
State Land	81,471	39,356
State Water	3,523	970
Forest Service	16,489	399
Water	327	1,565

Source: BLM 2012a

Soil Restoration Potential on BLM-administered lands within the planning area is shown in **Table 3-52**, Soil Restoration Potential on BLM-Administered Lands, and **Figure 3-11**, Soil Restoration Potential, in **Appendix A**.

**Table 3-52**  
**Soil Restoration Potential on BLM-Administered Lands**

<b>Headwaters</b>	<b>Total (acres)</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
High	4,626	0	270 (6%)
Moderate	1,172	0	41 (3%)

**Table 3-52**  
**Soil Restoration Potential on BLM-Administered Lands**

<b>Headwaters</b>	<b>Total (acres)</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
Low	123	0	60 (49%)
Not Rated	1,964	0	70 (4%)
<b>Judith Resource Area</b>	<b>Total</b>	<b>PPH (acres)</b>	<b>PGH (acres)</b>
High	191,904	78,718 (41%)	32,714 (17%)
Moderate	309,409	93,798 (30%)	70,772 (23%)
Low	73,265	59,567 (81%)	3,639 (5%)
Not Rated	11,516	1,133 (10%)	4,471 (39%)

Source: BLM 2012a

### 3.17.3 Trends

Qualitative observations indicate that soil health, stability, and watershed health has improved overall on BLM-administered lands; however, there are areas where soil health and stability is diminishing due to concentrated commercial and recreational use and activities.

## 3.18 WATER RESOURCES

Streams and water quality are the focus of this section. Wetlands (including riparian areas) are discussed in **Section 3.5**. Water on BLM-administered lands is regulated by the Clean Water Act, Safe Drinking Water Act, Public Land Health Standards, and other laws, regulations, and policy guidance at the federal, state, and local levels.

### 3.18.1 Conditions of the Planning Area

The major sources of surface water in the planning area are the Missouri River, Sacagawea River (Crooked Creek), Musselshell River, Sun River, Dearborn River, Judith River, and Smith River. These rivers are tributaries of the Missouri River. Smaller watercourses in the planning area involve streams that can be ephemeral, intermittent, or perennial. Lakes can be permanent or temporary (see **Figure 3-12**, Water Features, in **Appendix A**). Wetlands and floodplains vary in extent and depth throughout the year (see **Figure 3-3** in **Appendix A**). Permanent waters can also be in the form of wells, springs, ponds, diversions, and reservoirs developed for human, wildlife or livestock consumption, as seen in **Table 3-53**, Developed Water Sources in the Planning Area. Dams and pits provide drinking water sources for GRSG, but can also provide habitat for mosquitos, which can increase the risk of spreading West Nile virus transmission among GRSG populations. Other water developments such as underground wells do not provide a drinking water source for GRSG, but also do not provide a habitat for mosquitos.

**Table 3-53  
Developed Water Sources in the Planning Area**

<b>Habitat Type</b>	<b>Feature Type</b>	<b>Number of Features</b>
No Habitat	Dam/Pit	2,919
	Other	-
PGH	Dam/Pit	838
	Other	3,816
PPH	Dam/Pit	2,420
	Other	3,699

Source: BLM 2012a

### 3.18.2 Conditions on BLM-Administered Lands

This discussion of existing conditions includes a description of surface water, water quality, and groundwater. The description is limited to BLM-administered lands within the planning area, especially lands within GRSG habitat.

#### **Surface Water**

Stream flow volumes differ greatly within the planning area. Flows in unregulated streams have large seasonal variations, with the largest flows generally occurring during spring or early summer as a result of snowmelt and rainstorms. Peak flows on prairie streams occur in March or April resulting from snowmelt. Larger peak flows on small drainages can occur from intense summer thunderstorms, but generally not on an annual basis. Peak flows on mountain streams occur from late May to early June. The peaks are less sharp than on prairie streams. Summer rainstorms can result in short intervals of increased stream flow during June through September. During winter, stream flow in prairie streams is greatly reduced or absent as a result of little ground water inflow and ice formation (BLM 1994).

Ephemeral streams do not flow during an average water year but do flow in response to large precipitation events. Intermittent streams flow during spring runoff for an average water year, but generally dry up later in the summer. Perennial streams contain some water all year for an average water year. Most of the streams on BLM-administered land in the planning area are intermittent and flow from March to July. However, streams can still contain water during other months due to stored water being fed to the streams from shallow groundwater sources or floodplains. **Table 3-54**, Watershed Acreages in the Planning Area, lists information watersheds on BLM-administered lands; **Table 3-55**, Streams on BLM-Administered Lands in the Planning Area, lists information for perennial and intermittent streams on BLM-administered lands in the planning area; and **Table 3-56**, Acres of Freshwater Pond and Lacustrine in PPH and PGH on BLM-Administered Lands in the Planning Area, lists information for ponds and lakes on BLM-administered lands in the planning area.

**Table 3-54**  
**Watershed Acreages in the Planning Area**

<b>Watershed</b>	<b>BLM</b>	<b>PH</b>	<b>BLM PH</b>	<b>GH</b>	<b>BLM GH</b>
Arrow	26,275	0	0	73,548	20,801
Belt	1,677	0	0	0	0
Box Elder	58,422	195,060	49,704	24,276	1,950
Bullwhacker-Dog	9,438	53,763	437	12,442	1,125
Flatwillow	55,548	119,038	39,583	87,849	5,582
Fort Peck Reservoir	32,086	108,179	12,901	51,364	14,393
Judith	25,635	0	0	86,464	14,915
Lower Musselshell	123,465	120,300	23,523	49,482	22,047
Middle Musselshell	10,252	85,364	6,364	30,541	3,888
Smith	153	0	0	2,827	0
Upper Missouri	645	0	0	2,384	0
Upper Musselshell	1,044	0	0	37,917	144

Source: BLM 2012a

**Table 3-55**  
**Streams on BLM-Administered Lands in the Planning Area**

<b>RMP</b>	<b>Intermittent or Perennial Stream Miles</b>	<b>GRSG Habitat Type</b>
Headwaters	Intermittent: 21.0	No habitat
Headwaters	Perennial: 0.8	No habitat
Headwaters	Intermittent: 3.4	PGH
Headwaters	Perennial: 0.0	PGH
Judith Resource Area	Intermittent: 1237.4	No habitat
Judith Resource Area	Perennial: 22.9	No habitat
Judith Resource Area	Intermittent: 706.1	PGH
Judith Resource Area	Perennial: 8.1	PGH
Judith Resource Area	Intermittent: 1320.4	PPH
Judith Resource Area	Perennial: 12.8	PPH

Source: BLM 2012a

**Table 3-56**  
**Acres of Freshwater Pond and Lacustrine in PPH and PGH on BLM-Administered**  
**Lands in the Planning Area**

<b>RMP</b>	<b>GRSG Habitat Type in Wetlands</b>	<b>Acres</b>
Headwaters	PGH	<1
Headwaters	Outside of GRSG habitat	<1
Judith Resource Area	PPH	974
Judith Resource Area	PGH	60
Judith Resource Area	Outside of GRSG habitat	209
<b>Total</b>		<b>1,243</b>

Source: BLM 2012a

Riparian areas are ecosystems that occur along rivers, streams, or waterbodies. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Typical riparian areas are lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers, streams, and shores of lakes and reservoirs with stable water levels. Excluded are such sites as ephemeral streams or washes that do not exhibit vegetation dependent on free water in the soil. Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and which, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, swamps, lakeshores, sloughs, bogs, wet meadows, estuaries, and riparian areas. Even though riparian and wetland areas occupy only a small percentage of BLM-administered land in the planning area (approximately 0.4 percent), these areas provide a wide range of functions critical to many different wildlife species, improve water quality, provide scenery, and provide recreational opportunities.

Healthy surface water sources (such as ponds, lakes, and wetlands) provide habitat for insects and animals that are predators of mosquitos. Areas that both have standing water and do not support predators of mosquitos can be areas where mosquito populations increase. The conditions of wetlands (including riparian areas) are discussed in **Section 3.5**.

Water developments are also influential sources of water for wildlife. Water developments can function for multiple uses. They provide additional and alternative sources of water for wildlife and livestock, and can decrease use of riparian areas. Within the planning area, most of the water developments are intended for livestock, followed by water developments intended for fish. There are 13,702 water developments in the decision area, and 10,733 water developments in GRSG habitat, none of which are for GRSG. However, wildlife will often take advantage of available water developments.

### **Water Quality**

Water quality, as defined by the Clean Water Act, includes all the physical, biological, and chemical characteristics which affect existing and designated beneficial uses. The State of Montana is required to identify which beneficial uses a water body currently supports or could support in the future. Water quality standards are established to protect the beneficial uses of the state's waters. Beneficial uses are identified for specific waters.

The State of Montana is required by Section 303(d) of the Clean Water Act to identify waters which are water quality impaired because of failing to meet their designated beneficial uses. Section 303(d) requires that each state develop a list of water bodies that fail to meet water quality standards and delineate stream segments and listing criteria for all streams. The Section 303(d) list of impaired waters is updated biannually, and the state is required to develop a total maximum daily load allocation for each pollutant of concern. **Table 3-57**, Impaired Streams on BLM-Administered Lands in the Planning Area, lists information for impaired streams on BLM-administered lands in the planning area.

Upland and, especially riparian land health conditions greatly influence water quality. The functioning condition of riparian and wetland areas is a result of the interaction of geology, soil, water, and vegetation (BLM 1998). Riparian areas surrounding rivers, streams, and springs (lotic waters) are in PFC when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality
- Filter sediments, capture bedload, and aid floodplain development
- Improve floodwater retention and groundwater recharge
- Develop root masses that stabilize streambanks against cutting action
- Develop diverse ponding and channel characteristics to provide the habitat, water depth, duration, and temperature necessary for fish production, waterfowl breeding and other uses
- Support greater biodiversity

Streams that are in PFC typically have channel dimensions that are appropriate for the landscape and setting and adequate riparian-wetland vegetation to stabilize banks from cutting action. Both of these features help to reduce erosion and mitigate non-point source pollutants, thereby improving water quality. Functional conditions of streams on BLM-administered lands can be found in **Table 3-21**. However, PFC does not connote adequate or good water quality. Water of poor water quality flowing into a section of stream with PFC would still have poor water quality.

**Table 3-57**  
**Impaired Streams on BLM-Administered Lands in the Planning Area**

<b>RMP</b>	<b>GRSG Habitat Type</b>	<b>Cause or Source of Stream Impairment</b>	<b>Stream Name</b>	<b>Miles</b>
Headwaters	No Habitat	Sedimentation/Siltation [CFL 1990], Phosphorus (Total) [CFL 2006], Nitrogen (Total) [CFL 2006], Temperature, water [CFL 1988]	Elk Creek	0.26
		Sedimentation/Siltation [CFL 1990], Temperature, water [CFL 2006], Phosphorus (Total) [CFL 2006]	Battle Creek	0.42
		Grazing in Riparian or Shoreline Zones, Natural Sources	North Fork Musselshell River	0.32
Judith Resource Area	No Habitat	Grazing in Riparian or Shoreline Zones, Natural Sources	Blood Creek	9.02
		Grazing in Riparian or Shoreline Zones, Flow Alterations from Water Diversions, Impacts from Resort Areas (Winter and Non-winter Resorts), Agriculture, Impacts from Hydrostructure Flow Regulation/modification, Streambank Modifications/destabilization	Musselshell River	1.33
		Cadmium [CFL 1992], pH [CFL 1992], Mercury [CFL 1992], Copper [CFL 1992], Zinc [CFL 1992]	Armells Creek	1.60
		Cyanide [CFL 2004], Thallium [CFL 2004], Selenium [CFL 2004], Iron [CFL 2004]	Last Chance Creek	0.14
		Iron [CFL 2006], Phosphorus (Total) [CFL 2006], Aluminum [CFL 2006], Lead [CFL 2006], Nitrogen (Total) [CFL 2006]	Fargo Coulee	0.09
		Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 2004], Sedimentation/Siltation [CFL 2004]	Dog Creek	10.98
		pH [CFL 1992], Lead [CFL 1992], Zinc [CFL 1992]	Chicago Gulch	1.33
		pH [CFL 1992], Lead [CFL 1992], Zinc [CFL 1992]	Collar Gulch	2.50
		Sedimentation/Siltation [CFL 1988], Chromium (total) [CFL 1988], Copper [CFL 1988]	Belt Creek	0.20
		Sedimentation/Siltation [CFL 1996], Nitrates [CFL 2000]	Big Otter Creek	0.00
		Sedimentation/Siltation [CFL 2002]	North Fork Flatwillow Creek	0.28
		Selenium [CFL 2006], Total Dissolved Solids [CFL 2006], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1990]	Coffee Creek	0.92

**Table 3-57**  
**Impaired Streams on BLM-Administered Lands in the Planning Area**

<b>RMP</b>	<b>GRSG Habitat Type</b>	<b>Cause or Source of Stream Impairment</b>	<b>Stream Name</b>	<b>Miles</b>
Judith Resource Area	PGH	Agriculture, Grazing in Riparian or Shoreline Zones, Loss of Riparian Habitat, Rangeland Grazing	Judith River	6.96
		Agriculture, Channelization, Streambank Modifications/destablization, Impacts from Hydrostructure Flow Regulation/modification	Musselshell River	0.91
		Iron [CFL 2006]	Arrow Creek	0.74
		Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 2004], Sedimentation/Siltation [CFL 2004]	Dog Creek	1.33
		Selenium [CFL 2006], Iron [CFL 2006], Total Dissolved Solids [CFL 1992]	Wolf Creek	0.25
		Selenium [CFL 2006], Total Dissolved Solids [CFL 2006], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1990]	Coffee Creek	0.23
Judith Resource Area	PPH	Unknown Reason for Stream Impairment	Snoose Creek	4.59
		Grazing in Riparian or Shoreline Zones, Natural Sources	Blood Creek	11.86
		Agriculture, Channelization, Streambank Modifications/destablization, Impacts from Hydrostructure Flow Regulation/modification	Musselshell River	0.03
		Iron [CFL 2006], Phosphorus (Total) [CFL 2006], Aluminum [CFL 2006], Lead [CFL 2006], Nitrogen (Total) [CFL 2006]	Fargo Coulee	0.03
		Iron [CFL 2006], Sulfates [CFL 2006], Phosphorus (Total) [CFL 2006], Sedimentation/Siltation [CFL 1994], Specific Conductance [CFL 2006], Solids (Suspended/Bedload) [CFL 1994], Nitrogen (Total) [CFL 2006]	North Willow Creek	2.03
		Total Dissolved Solids [CFL 2006], Sedimentation/Siltation [CFL 1988], Specific Conductance [CFL 2006]	McDonald Creek	0.04

Source: BLM 2012a  
CFL = cycle first listed

### **Groundwater**

Groundwater is used for irrigation, domestic use, and livestock use. The quality of the groundwater is a function of the chemical makeup of the underground

formation containing the water. Springs and seeps occur in areas where water from aquifers reaches the surface. Many springs begin in stream channels; others flow into small ponds or marshy areas that drain into channels. Some springs and seep areas form their own channels that reach flowing streams, but other springs lose their surface expression and recharge alluvial fill material or permeable stratum.

Springs and seeps are important to aquatic habitats because of the perennial base flow they provide to a stream. The outflow from springs in summer usually helps to maintain lower water temperatures. In winter, especially in small streams, base flow helps to maintain an aquatic habitat in an otherwise frozen environment.

Springs have been disturbed either by management activities that have affected the volume of water available to the vegetation and soils where springs begin, or by activities that have affected the vegetation and soils directly. Activities, such as grazing, water developments, recreation use, mining, road construction, and vegetation management, have affected spring systems in the past. Activities such as well drilling or blasting can affect springs by reducing the amount of water in their aquifers or by affecting subsurface flow patterns.

### **3.18.3 Trends**

Demands on water resources have increased over the past few decades. Although most early water rights were established for irrigation and livestock, today's demand includes municipal water supplies, commercial and industrial supplies, and maintenance of adequate stream flows for fish, recreation, and water quality.

Management activities involving ROW disturbance, grazing, and fire have created situations that alter land health, thereby impairing water quality. Livestock water impoundments have altered surface and subsurface water flow. The number of new livestock water impoundments has leveled off due to a lack of appropriate locations for such developments. Consequently, future water developments are expected to rely more on wells and stock tanks.

The availability of water in much of the planning area is limited and may hamper additional developments that depend on water. Future water development for wildlife, recreation, and livestock would require a water right before project implementation could occur. Any additional water developments would require adhering to Montana state laws for surface and ground water.

## **3.19 SPECIAL STATUS SPECIES – OTHER SPECIES OF ISSUE**

This section provides a description of special status species other than GRSG. Refer to **Section 3.3**, Greater Sage-Grouse, for a discussion of GRSG. **Section 3.3** also includes a discussion of special status species policies and regulations.

### 3.19.1 Conditions of the Planning Area

The planning area consists of over 7.3 million acres of land which provides potential habitat for special status species (**Table 3-58, Habitat by Ownership within the Planning Area**). The BLM directly manages approximately 593,993 acres of habitat within the planning area. Private landowners, the State of Montana, and others (not managed by an organization) hold the remaining 6.7 million acres within the planning area. It is critical to work with all landowners and resource agencies throughout the planning area to provide protection for special status species since the majority of habitat across the landscape is held by entities outside of the BLM.

**Table 3-58**  
**Habitat by Ownership within the Planning Area**

	<b>BLM</b>	<b>State</b>	<b>Private</b>	<b>Other</b>	<b>Total</b>
PGH (acres)	112,341 (11%)	83,433 (8%)	816,648 (80%)	2,378 (0.2%)	1,014,786
PPH (acres)	233,219 (19%)	90,587 (7%)	878,155 (73%)	6,016 (0.5%)	1,207,977
Outside of GRSG habitat (acres)	248,435 (5%)	352,483 (7%)	3,473,364 (68%)	1,014,458 (20%)	5,088,752
<b>Total</b>	<b>593,995</b> <b>(8%)</b>	<b>526,503</b> <b>(7%)</b>	<b>5,168,167</b> <b>(71%)</b>	<b>1,022,852</b> <b>(14%)</b>	<b>7,311,515</b>

Source: BLM 2012a

Special status species that are known to occur within the counties of the planning area (Chouteau, Fergus, Judith Basin, Meagher, and Petroleum), were identified using the Montana Natural Heritage Program (MTNHP) web site (MTNHP 2012a and 2012b). No special status fish species are confirmed or likely to inhabit the planning area. Special status animal species that are confirmed or likely to inhabit the planning area include the following mammal species black-tailed prairie dog (*Cynomys ludovicianus*), fringed myotis (*Myotis thysanodes*), gray wolf (*Canis lupis*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), swift fox (*Vulpes velox*), Townsend's big-eared bat (*Plecotus townsendii*), and white-tailed prairie dog (*C. leucurus*).

Special status bird species include Baird's sparrow (*Ammodramus bairdii*), black tern (*Chilodnius niger*), black-crowned night heron (*Nycticorax nycticorax*), bobolink (*Dolichonyx orysivorus*), Brewer's sparrow (*Spizella breweri*), chestnut-collared longspur (*Calcarius ornatus*), dickcissel (*Spiza americana*), Franklin's gull (*Larus pipixcan*), least tern (*Sternula antillarum*), loggerhead shrike (*Lanius ludovicianus*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), McCown's longspur (*Calcarius mccownii*), mountain plover (*Charadrius montanus*), red-headed woodpecker (*Melanerpes erythrocephalus*), sage sparrow

(*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), Sprague's pipit (*Anthus spragueii*), and white-faced ibis (*Plegadis chihi*). Special status raptor species include bald eagle (*Haliaeetus leucocephalus*), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), and Swainson's hawk (*Buteo swainsoni*),

The following special status reptile species that are confirmed or potentially inhabit the planning area includes greater short-horned lizard (*Phrynosoma hernandesi*), milk snake (*Lampropeltis triangulum*), snapping turtle (*Chelydra serpentina*), and Western hog-nosed snake (*Heterodon nasicus*). Special status amphibian species include Great Plains toad (*Bufo cognatus*), northern leopard frog (*Lithobates pipiens*), Plains spadefoot (*Spea bombifrons*), and Western toad (*Anaxyrus boreas boreas*).

Two special status plant species are likely to inhabit the planning area little Indian breadroot (*Pediomelum hypogaeum*) and Platte cinquefoil (*Potentilla plattensis*). Little Indian breadroot is a perennial herb that is distributed from Nebraska to Montana and south to New Mexico and Texas (MTNHP 2013a). This herb prefers grasslands and open pine woodlands with loose, sandy soil below sandstone outcrops. Little Indian breadroot is suspected of being poisonous and is considered unpalatable to domestic livestock (Forest Service 2013). Platte cinquefoil is also a perennial herb that occurs throughout the Great Plains in Canada (Alberta and Manitoba) south to Arizona and New Mexico (MTNHP 2013b). Platte cinquefoil occupies mesic grasslands and sagebrush steppe as well as alpine-montane wet alkaline meadows often on hummocks of shrubby cinquefoil (*Dasiphora fruticosa*). Currently, the Billings and Miles City field offices have proposed removing Platte cinquefoil from the sensitive plants list.

More detailed information regarding special status species including status and general habitat descriptions for confirmed or potentially known species to inhabit the planning area can be found in **Appendix L**, Special Status Species Confirmed or Likely to Inhabit the Planning Area.

### 3.19.2 Conditions on BLM-Administered Lands

The planning area has over 1.2 million acres of PPH and over one million acres of PGH; however, the BLM manages 233,219 acres of PPH and 112,341 acres of PGH (refer to **Table 3-58**). The BLM-administered lands have the potential to provide habitat to a wide range of special status animal and plant species (see **Appendix L**).

### 3.19.3 Trends

The State of Montana provides status and trends data for special status species on the Montana Natural Heritage Program website (MTNHP 2012a and 2012b). Below is a general description of the current trends for special status animal and plant species in Montana.

### **Animals**

A list of special status animal species with the potential to inhabit the planning area is included in **Appendix L**. Special status mammals, birds, reptiles and amphibians are vulnerable to global extinction or extirpation in Montana due to limited or declining populations and declining range or habitat. Breeding populations of mountain plover and chestnut-collared longspur are at greatest risk of extirpation or extinction for bird species. The northern leopard frog is likely to occur in GRSG habitat and is at high risk to global extinction or extirpation in the state.

### **Plants**

Special status plant species that may inhabit the planning area are included in **Appendix L**. Little Indian breadroot and Platte cinquefoil are at risk of extinction or extirpation in the state due to limited to very limited and declining numbers, range and habitat, even though they may be abundant in some areas.

## **3.20 FISH AND WILDLIFE**

MFWP and USFWS are directly responsible for the management of fish and wildlife species in the planning area, and the BLM is responsible for land management. Therefore, on BLM-administered lands in the planning area, the BLM is directly responsible for the management of habitat for fish and wildlife species and indirectly responsible for the health of fish and wildlife populations that are supported by these habitats.

Implementation of any of the alternatives would result in general and unquantifiable indirect beneficial effects for fish in terms of greater protection through new restrictions on surface and resource use resulting in reduced opportunities for surface disturbance or habitat disruption where they exist. Therefore, general fish species will not be discussed further in **Chapter 3**.

The wildlife habitats that occur in the planning area are primarily characterized in the vegetation, soil, and water, and vegetation existing conditions discussions in **Sections 3.5, 3.17, Soil Resources, and 3.18, Water Resources**, respectively. See **Table 3-2** and **Table 3-3** for acres of PPH and PGH within vegetation types on lands in the LFO. The discussions of aquatic and terrestrial habitat below identify attributes of these resources that are particularly important to their role in providing habitat. **Table 3-59, Wildlife Species of the Lewistown Field Office**, lists species of high priority for BLM management efforts due to their economic value, regulatory status, high public interest, or other qualities. Special status species are described in **Section 3.19**.

**Table 3-59  
Wildlife Species of the Lewistown Field Office**

Species or Group	Rationale for Key Designation
<b>Birds</b>	
Waterfowl and migratory birds (cranes, ducks, geese, and swans)	Economic and recreational value/high interest and protected by law
Upland game (partridge, pheasant, and grouse)	Economic and recreational value
Eagles/other raptors (hawks)	High interest, protected by law, keystone species
<b>Mammals</b>	
Big game (elk, deer, pronghorn)	High interest, economic and recreational value
<b>Herptiles</b>	
Reptiles	Ecological function and indicators of ecosystem health
Amphibians	Ecological function and indicators of ecosystem health

Source: MTNHP 2012b

### 3.20.1 Conditions of the Planning Area

There are 7.3 million acres within the planning area and the BLM directly manages nearly 593,995 acres of wildlife habitat (refer to **Table 3-58**). The remaining 6.7 million acres are primarily held by private landowners. The presence and interspersions of many habitat types support a large number of wildlife species throughout the planning area regardless of ownership. The discussion of wildlife populations and habitat addresses the entire planning area, not just the lands managed by BLM. Since wildlife are mobile and may readily cross these boundaries, it is important to work cooperatively with all landowners and resource agencies to improve wildlife management throughout the planning area.

Big game including elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus*), pronghorn (*Antilocapra americana*), mountain lion (*Puma concolor*), black bear (*Ursus americanus*); upland game birds including pheasant (*Phasianus colchicus*), sharp-tailed grouse (*Tympanuchus phasianellus*), and gray (Hungarian) partridge (*Perdix perdix*); and numerous waterfowl species are among the species that use habitat in the planning area. The diversity and populations of wildlife throughout the planning area provide considerable recreational opportunities and economic benefits for the State of Montana. A minimum of 81 species of mammals, 303 species of birds, and 21 species of amphibians and reptiles occur in the planning area (MTNHP 2012b).

Wildlife species of primary management concern to one or more agencies, such as the BLM, MFWP, and USFWS include game species, rare, or keystone

species. Therefore, they require consideration in management activities and may affect land management decisions. A keystone species is one whose presence and role within an ecosystem has a disproportionate effect on other organisms within the system.

### **3.20.2 Conditions on BLM-Administered Lands**

The LFO has 345,560 acres of GRS habitat including 233,219 acres of PPH (refer to **Table 3-58**). These lands have the potential to provide habitat to a wide range of wildlife species as described above in **Section 3.20.1**.

### **3.20.3 Trends**

Wildlife species trend data for the planning area were obtained from the MTNHP Tracker web tool (MTNHP 2012b). Below are general descriptions of the current trends for key wildlife species groups as described in **Section 3.20.1**.

The majority of waterfowl within the planning area are common, widespread, and abundant (although they may be rare in parts of their ranges). These common waterfowl species are not considered vulnerable in most of its range or during the breeding season. Harlequin duck populations are at risk; hooded merganser and trumpeter swan are potential species of concern and species of concern respectively. Gray partridge and ring-necked pheasant are introduced upland game bird species, and their statuses are not ranked by the State of Montana. These upland birds occur year round in all five counties within the planning area. GRS are currently being considered for listing by the ESA. For more information regarding GRS refer to **Section 3.3**. The sharp-tailed grouse population within the planning area is secure though it may be quite rare in parts of its range. Sensitive raptor species are secure to declining throughout the planning area. Big game species of Montana including elk, mule deer, white-tail deer, and pronghorn antelope as well as black bear are considered common, widespread, and abundant. Mountain lion populations are secure to declining within its range. In general, reptile and amphibian populations within the LFO are not in decline or at risk of extinction (Maxell et al. 2009).

## **3.21 RENEWABLE ENERGY**

Renewable energy projects on BLM-administered lands throughout the US include wind, solar, geothermal, and biomass projects and the siting of transmission facilities needed to deliver this power to the consumer. Geothermal heat is also considered a leasable mineral and is governed by the Geothermal Steam Act of 1970. There are no geothermal resources within the planning area; therefore, geothermal resources will not be discussed in **Chapter 3** or **Chapter 4**.

As of 2010, the BLM's renewable energy policy is directed by the following regulations and executive orders:

- The Energy Policy Act of 2005 (Title II, Section 211), which requires the DOI to approve at least 10,000 megawatts of renewable energy on public lands by 2015.
- Executive Order 13212, Actions to Expedite Energy-Related Projects, which requires federal agencies to expedite review of energy project applications.
- Secretarial Order 3285, which requires the DOI to identify and prioritize specific locations best suited for large-scale renewable energy production.

Additionally, the BLM has specific guidance for certain types of renewable energy. The main IMs are summarized here:

- IM 2011-003, Solar Energy Development Policy (BLM 2011c), establishes policy for the processing of ROW applications for solar energy development projects on BLM-administered lands and evaluating the feasibility of installing solar energy systems on BLM administrative facilities and projects.
- IM 2009-043, Wind Energy Development Policy (BLM 2008e), provides updated guidance on processing ROW applications for wind energy projects on BLM-administered lands.
- IM 2011-061, Solar and Wind Energy Applications – Pre-Application and Screening (2011d), establishes screening criteria used by the BLM to assist in prioritizing the processing of and in determining what actions to take on new and existing solar and wind energy development ROW applications. The processing of applications with the least environmental resource conflicts should facilitate the development of environmentally responsible solar and wind energy projects on the public lands, consistent with the provisions of the Secretarial Order.
- IM 2004-227, Biomass Utilization Strategy (BLM 2004b), updated in July 2005, provides sets of goals to help focus and increase utilization of biomass from BLM-administered lands. In June 2005, the final rule in the Federal Register revised the authority of 48 CFR Part 1452 by adding 1452.237-71, which is a new contract clause for removal and utilization of woody biomass generated as a result of land management service contracts whenever ecologically and lawfully appropriate. The BLM issued IM 2009-120 in May 2009, which updated the contract clause for utilization for woody biomass (BLM 2009d).

Solar and wind projects are authorized via the ROW authorization process. ROW applications for development on BLM-administered lands must be accompanied by a processing fee as set forth in 43 CFR 2804.14. ROW

applications are generally accepted and processed on a first-come, first-served basis. The ROW regulations (43 CFR 2804.23[c]) provide authority for offering BLM-administered lands under competitive bidding procedures for ROW authorizations. The BLM may initiate a competitive process if a land use planning decision has specifically identified an area for competition, or when two or more applications are submitted for the same facility or system. The BLM may also consider other public interest and technical factors in determining whether to offer lands for competitive leasing. Competitive bidding follows procedures required by 43 CFR 2804.23(c).

### **3.21.1 Conditions of the Planning Area**

#### ***WAFWA Management Zones 1 and 4***

There are no acres of solar or wind energy ROWs in the planning area (Manier et al. 2013). The data and information included from the BER was the most accurate available when the data was “frozen” in time for analysis purposes; however, these scenarios remain based in present knowledge. Spatial data informing the existing conditions were compiled to establish a consistent information base across the entire region (GRSG Management Area), but, in order to attain this consistently across state, ownership, and management boundaries, some local data have been omitted. There may be inconsistencies between WAFWA-level and local planning-level data. As such, these data provide a regional baseline, suitable for guiding regional mid- to long-term analysis scenarios (Manier et al. 2013).

Below is a summary of renewable energy interest in Montana.

#### ***Solar***

No interest in commercial-scale solar energy development has occurred in Montana. Fewer annual days of sunshine and the low angle of the sun during the winter contribute to low solar development in the state.

#### ***Wind Energy***

A number of new wind farms have been developed and proposed on private lands along the I-15 corridor in northwestern Montana in proximity to the recently approved Montana Alberta Tie Line transmission project. Projects continue to be proposed all across Montana in a number of counties. However, the distance from current transmission infrastructure continues to be a challenge for wind developers in Montana, and grid capacity is also be a limiting factor. Currently, the only wind facility authorized on BLM-administered lands in the Montana/Dakotas is located in South Dakota.

#### ***Biomass***

Montana may have good prospects for biomass development using its agricultural resources and land base. The growth of this energy development will still be hampered in Montana by lack of easy access to large consumption markets.

### 3.21.2 Conditions on BLM-Administered Lands

The National Renewable Energy Laboratory only considers solar resources to be viable when they occur at intensities of 6.0 kilowatt hours per square meter per day, and allocate designations of “Good,” “Excellent,” or “Premium.” Solar potential on BLM-administered land in the Lewistown District is below 6.0 kilowatt hours per square meter per day. Therefore, no BLM-administered lands in the planning area are considered likely to be pursued by commercial energy developers for utility scale solar (that is,  $\geq 20$  MW [megawatts] electricity that will be delivered into the electricity transmission grid [Manier et al. 2013]).

The National Renewable Energy Laboratory only considers wind resources to be viable when they occur at intensities of 400 watts per square meter or higher, and allocate designations of “Good,” “Excellent,” or “Outstanding” wind potential. Only 16 percent, or 62,916 acres, of the BLM-administered land in the Lewistown District has wind potential greater than 400 watts per square meter. Approximately 70 percent of this acreage is found within PPH and another nine percent of this acreage is found within PGH. **Table 3-60**, Wind Potential on Slopes <15% on BLM-administered Lands, shows the wind potential for all the BLM-administered Lands in LFO.

**Table 3-60**  
**Wind Potential on Slopes <15% on BLM-administered Lands**

Wind Potential	Total acres	PPH acres	PGH acres
Class 2, Poor, (below 300)	83,774	10,657 (13%)	1,552 (2%)
Class 3, Fair, (300-400)	248,989	165,627 (67%)	30,176 (12%)
Class 4, Good (400-500)	55,950	41,601 (74%)	5,247 (9%)
Class 5, Excellent (500-600)	5,701	2,121 (37%)	301 (5%)
Class 6, Outstanding (600+)	1,265	6 (0.5%)	46 (4%)

Source: BLM 2012a

### 3.21.3 Trends

Within the planning area, greater pressure to develop renewable energy resources on BLM-administered lands could occur as a result of public energy policy coming from individual states or the federal government. The development of more energy-efficient technologies for wind, biomass, and solar power will continue to grow with increasing regulation and price of fossil fuels and the increasing demand for energy products. In Montana, the source of renewable energy will most likely be wind energy, as Montana is ranked as the fifth highest state in wind energy potential by the National Renewable Energy Laboratory (NREL 2011).

### 3.22 SOCIAL AND ECONOMIC CONDITIONS

This section discusses the social and economic conditions of the planning area. These conditions are discussed in greater detail in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS Socioeconomic Baseline Assessment Report prepared in support of the planning effort (Forest Service Enterprise 2013).

Changes in BLM management of GRSG habitats are anticipated to have a considerable impact on existing GRSG populations and have the potential to affect local social and economic conditions. Certain defining features of every area influence and shape the nature of local social and economic conditions. These defining characteristics include the local population, the presence of or proximity to large cities or regional population centers, types of longstanding industries, predominant land and water features, and unique area amenities. The characteristics of counties in Central Montana containing GRSG habitat influence the relationship between BLM-administered lands and local social and economic activity.

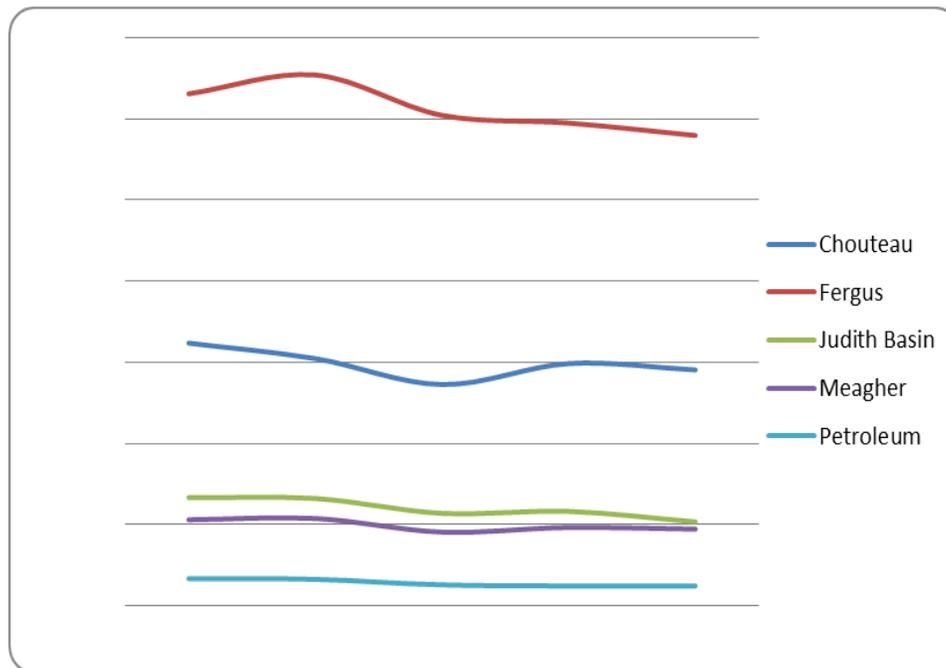
Changes in management of BLM-administered lands can have social and economic effects which extend beyond the immediate boundaries of the lands managed, affecting the social and economic conditions of neighboring counties and communities. Individual counties and communities may respond to change differently than the larger region; consequently a multidimensional approach is used to analyze the impacts of the proposed GRSG conservation measures. For this analysis, social and economic conditions, current conditions and trends are presented for a five-county region which includes Chouteau, Fergus, Judith Basin, Meagher, and Petroleum counties. Data is provided for the state as a whole as a reference region where appropriate.

#### 3.22.1 Existing Conditions

##### ***Population Change***

While the total US population grew by 24 percent between 1970 and 2010, the five-county impact area experienced an 11 percent decline. Over the past four decades populations in all five counties of the planning area have fallen: Chouteau (-660 people), Fergus (-1,025 people), Judith Basin (-595 people), Meagher (-231 people), and Petroleum (-181 people) (**Diagram 3-4**, Population Change for the Five-County Impact Area). Population declines within the five-county region have gradually tapered off over the last decade as the total population within the five-county region fell by 761 people, or just over three percent. Although population loss in Petroleum County halted and losses in Chouteau (-3 percent), Fergus (-3 percent), and Meagher (-2 percent) slowed, Judith Basin continued to experience a significant loss of 11 percent.

**Diagram 3-4**  
**Population Change for the Five-County Impact Area**



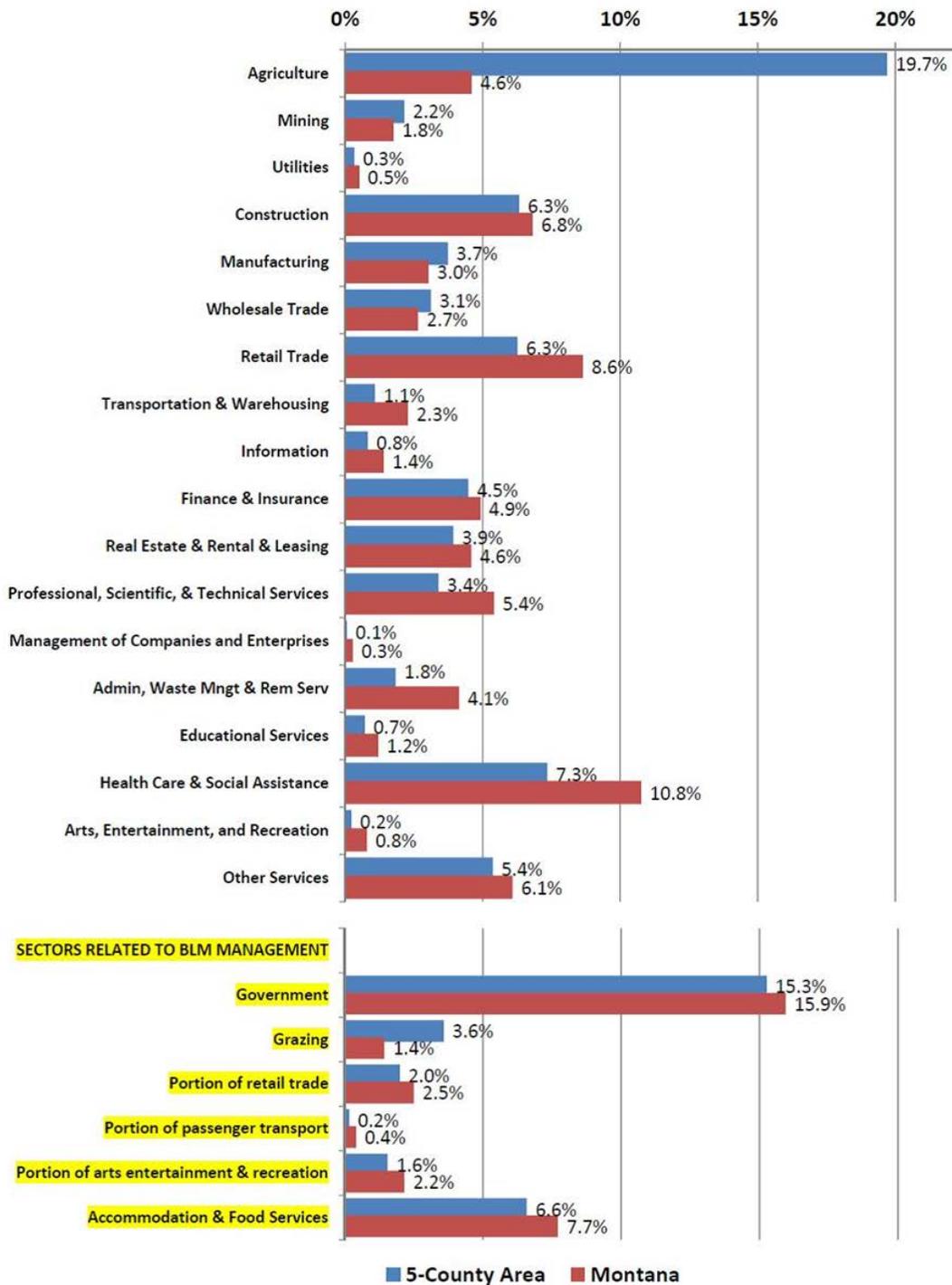
Source: US Department of Commerce, 2005, 2000, and 2010

#### **Employment and Economic Specialization**

Average annual unemployment in the five-county impact area has remained relatively constant over the last decade, with unemployment in each of the five counties remaining below state and national averages. While national unemployment in the US rose from four percent in 2000 to 9.6 percent in 2010, unemployment in the five-county impact area remained relatively more constant increasing from 4.9 percent in 2000 to 5.8 percent in 2010. Average annual unemployment varied across the five counties but was reported to be lower than the 2010 national average in all five counties. In 2010, Chouteau, Fergus, Judith Basin, Meagher, and Petroleum counties were reported to have had an average annual unemployment rate of 4.4 percent, 6.1 percent, 5.6 percent, 8.6 percent, and 6.3 percent, respectively, while unemployment was 6.9 percent in Montana and 9.6 percent for the US (Bureau of Labor Statistics 2011).

Employment within the five-county impact area is distributed amongst economic sectors and displayed below in **Diagram 3-5**, Employment Distribution in the Five-County Impact Area and Montana, relative to statewide employment in these sectors. The bottom six highlighted sectors are directly related to BLM land management. The contributions from BLM represent only a portion of the industry employment displayed in these six sectors. The government sector includes all federal, state, and local employment, while the grazing sector includes both cattle and sheep ranching. The last four sectors are all specifically

**Diagram 3-5**  
**Employment Distribution in the Five-County Impact Area and Montana**



Source: IMPLAN 2010

attributable to tourism and recreation (Forest Service Enterprise 2013). Further discussion of the contributions to these sectors from BLM management is presented below.

Using the ratio of the percent employment in each industry in the region of interest (five-county impact area) to the percent of employment in that industry for a larger reference region (the state of Montana) reveals whether labor specialization exists within the impact area. For a given industry, when the percent employment in the impact area is greater than in the reference region, local employment specialization exists in that industry (Forest Service 1998). Identification of employment specialization within the impact area provides a frame of reference for the contributions of BLM-administered lands within the impact area. Applying this criterion to 2010 data reveals that the planning area can be characterized as most specialized in the agricultural sectors, which include sectors related to livestock grazing. Since BLM-administered lands within the five-county area provide local livestock producers with forage to supplement other sources of feed, a portion of this specialization can be attributable to BLM management.

#### ***Community Well-Being***

Community well-being relates to the economic, social, cultural, and political components of community life which allows residents to fulfill their basic needs, while creating an enjoyable place for citizens to live. While many factors contribute to quality of life in a region, unemployment, poverty and personal income are the most commonly used social indicators of well-being. As discussed above, labor participation in Chouteau, Fergus, Judith Basin, Meagher, and Petroleum counties is high; average annual unemployment rates have persistently been lower than state and national averages over the last decade.

Following the Office of Management and Budget's Directive 14, the US Census Bureau uses a set of predetermined income thresholds which vary by family size and composition to detect who is poor. If the total income for a family or an unrelated individual falls below the relevant threshold, then the family or unrelated individual is classified as being "below the poverty level." While poverty rates for individuals and families at the state (14.5 percent and 9.7 percent) and national (13.8 percent and 10.1 percent) level remained high in 2010, poverty in the five-county area was reported to be even more prevalent with 16.4 percent of individuals and 12.9 percent of families living below the poverty level in 2010. Poverty at the county level varied across the five counties, with Judith Basin reporting the lowest rates and Chouteau reporting the highest. In 2010, 21 percent of individuals and 14.8 percent of families in Chouteau, 14.7 percent of individuals and 12.5 percent of families in Fergus, 9.9 percent of individuals and 6.4 percent of families in Judith Basin, 19 percent of individuals and 14.1 percent of families in Meagher, and 16.7 percent of individuals and 18.1 percent of families in Petroleum were estimated to be living in poverty (US Department of Commerce 2012a).

Total personal income (TPI) and per capita personal income (PCPI) are two more widely used measures of economic well-being within communities. From 1970 to 2010, annual TPI in the five-county impact area increased from \$581 million to \$769 million, and annual PCPI increased from \$23,683 to \$35,183 (all measures adjusted for inflation to 2011 dollars). This translates to a TPI increase of 32 percent and a PCPI increase of 48 percent over this time period (US Department of Commerce 2012b). While PCPI is a useful measure of economic well-being it should be examined alongside changes in real earnings per job. Since PCPI includes income from 401(k) plans as well as other non-labor income sources like transfer payments, dividends, and rent, it is possible for per capita income to rise, even if the average wage per job declines over time. While PCPI rose between 1970 and 2010 by 48 percent, average earnings per job shrank by 21 percent (from \$38,663 to \$30,511; values adjusted for inflation to 2011 dollars) (Forest Service Enterprise 2013). Increased PCPI in the face of falling wages indicates that non-labor income's share of TPI significantly rose during this period.

#### ***Components of Personal Income***

Further examining trends within personal income provides insight to the area economy and its connection to BLM-administered lands within the five-county impact area. There are three major sources of personal income: (1) labor earnings or income from the workplace; (2) investment income, or income received by individuals in the form of rent, dividends, or interest earnings; and (3) transfer payment income or income received as Social Security, retirement and disability income or Medicare and Medicaid payments.

In 2010, labor earnings accounted for nearly half of TPI in the five-county region, but long-run trends indicate that labor earnings' share of TPI has been declining. Labor earnings' share of TPI has decreased from 1970 to 2010 (from 72.3 to 49.9 percent) while the share of non-labor income has risen (from 27.7 to 50.1 percent). As a share of TPI, investment income and transfer payments rose from 18.6 to 28.1 and 9.1 to 22 percent, respectively, over this 40-year time period. Although transfer payments' share of TPI rose drastically over this period, data indicated this increase was only slightly due to increases in income maintenance payments related to welfare or unemployment. The data shows the share of income maintenance increased from less than one percent to 3.7 percent while the share of age related transfer payments in the form of retirement, disability insurance, and Medicare increased from six to 15.3 percent between 1970 and 2010 (US Department of Commerce 2012b). Increased shares of age-related transfer payments is an indication that the region's population is growing older, with people 65 and older accounting for a large percent of the region's population.

#### ***Area Economic Conditions Related to Grazing***

From 1970 to 2010, employment in the farm sector (including livestock grazing) decreased by 43.9 percent (from 4,030 to 2,740 jobs), with nearly 78 percent of

farm employment in 2010 attributable to farm proprietors. Although employment has been declining, the farm sector continued to support 13,090 jobs (or 17.3 percent of total employment) in the five-county area in 2010 (US Department of Commerce 2012a). In 2011, livestock production in Montana accounted for 40.1 percent of the state's total farm receipts and was valued at \$1.4 million dollars (NASS 2012). According to agricultural statistics collected by the state, the five-county area was reported to have an inventory of 2,500,000 cattle and calves, and 225,000 head of sheep in 2011.

Under the Taylor Grazing Act and FLPMA, the BLM permits grazing on administered allotments for the purpose of fostering economic development for private ranchers and ranching communities by providing ranchers access to additional forage (Forest Service Enterprise 2013). The BLM estimates the grazing potential of each allotment permitted for grazing under ideal forage conditions, but determines the number of AUMs allocated each year based on range conditions. Currently, the LFO allocates 103,806 AUMs annually on allotments potentially affected by conservation measures under this RMPA. On an annual basis use of the allocated forage can be less based on market conditions, drought or range practices to protect other resources. Allocated forage in the decision area was used to estimate employment and labor income contributions to the five-county impact area economy using an IMPLAN input-output model. If all allocated AUMs were used, about 201 jobs (direct, indirect and induced) and \$2.8 million in labor income (direct, indirect and induced) would be contributed to the impact area economy on an average annual basis. Direct employment to the grazing (refer to **Diagram 3-5**) sector amounts to approximately 128 jobs which accounts for 29 percent of employment in this sector (IMPLAN 2010).

#### *Lands and Realty*

Lands and realty can be divided between land use authorizations and land tenure adjustments. Land use authorizations consist of ROWs, communication sites, and other leases or permits, while land tenure adjustments focus primarily on land exchange, acquisition (including purchase and easement acquisition), and disposal. Land tenure adjustments can be important to local and regional economies depending on their complexity and impacted resources, but overall land tenure adjustments are currently inactive within the planning area. Therefore, the discussion in this section focuses on land use authorizations (e.g., ROWs) given their importance to local and regional communities.

Currently, there are ROWs within GRSG habitat: 643 in PPH and 266 in PGH. These include ROWs for roads, trails and highways, transmission lines, telephone or communication lines, water facilities, railroad, pipeline and conduit. The area community and economy depends in part on these ROWs for access on roads, power to businesses and homes, and communication lines for expanding technology. Future expansion of Central Montana's rural fiber optic

network may cross BLM-administered land in the decision area. Currently, there are no existing wind energy ROWs within the decision area.

#### *Recreation*

The economic influence of recreation use on BLM-administered lands is related to local expenditures for goods and services such as gasoline, lodging, meals, and supplies. To understand the local economic influence of recreation use, it is important to understand that local expenditures vary depending on the type of activity, whether the recreation use is from local residents or non-local residents, and whether the activity involves overnight stays. Local expenditures related to recreation use support local employment and labor income. Generally, employment related to recreation and tourism tends to be seasonal and relatively low paid, with a high portion of the labor force self-employed. The recreation opportunities available in the decision area play an important role in the quality of life of local residents, and also attract visitors from elsewhere in the state and region. The BLM-administered lands in the decision area received an estimated 45,500 recreation visits in 2012 (Forest Service Enterprise 2013). Major recreation activities on BLM-administered lands in the decision area include motorized and non-motorized activities such as hunting, hiking, and wildlife viewing.

#### **Market and Non-Market Values**

Generally goods and services can be traded in markets where interactions between buyers and sellers dictate the price, or value, of a good through the unit prices and quantities sold. BLM-administered lands produce a wide range of environmental goods and services which society benefits from. Some goods, like forage for cattle, can easily be valued because livestock feed can be bought and sold in markets. Other resources provided by these lands, such as recreational opportunities, ecological processes, and habitat for unique species, cannot be bought and sold in traditional markets, which is why they are often characterized as non-market goods. Measuring the value of these non-market goods is important because these resources tend to be undervalued and estimates can enable management to make more informed decisions regarding their use to more accurately reflect their true value to society.

Non-market values can be broken down into two categories, use and non-use values. The use-value of a non-market good is the value to society from the direct use of the asset; these values are derived from BLM-administered lands through recreational activities such as hiking, bird watching and OHV use. In addition to hunting, other non-market values exist for public goods such as air quality, scenery and water quality. The use of non-market goods often requires consumption of associated market goods, such as lodging and gas.

Non-use, or passive use, values of a non-market good reflect the value of an asset beyond its current use. These can be described as existence, option and bequest values. Existence values are the amount society is willing to pay to

guarantee that an asset simply exists. An existence value for BLM-administered lands might be the value of knowing that undisturbed GRSG habitat exists or the value associated with undeveloped scenic landscapes. In addition to implicit existence values, society's willingness to pay to preserve resources for future use attaches additional passive use values. The potential benefits people would receive from future use are referred to as option values when future use is expected to occur within the same generation and bequest values when preservation allows future generations to benefit from the resource use. Within the LFO bequest and option values might exist for numerous plant and animal species, landscapes, heritage sites, and recreational trails. While use and non-use values exist for these lands, the methodologies for measuring these values are controversial and difficult to apply, making evaluation during the planning process not feasible. However, this does not preclude their consideration.

### 3.23 ENVIRONMENTAL JUSTICE

Executive Order 12898 requires federal agencies to “identify and address the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” According to the CEQ Environmental Justice Guidelines for NEPA (1997), “minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis...a minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above stated thresholds.”

In addition to race, concentrations of people living under the poverty level are of interest when considering the Environmental Justice implications of the proposed action. CEQ guidance on identifying low-income populations states “agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect.”

#### 3.23.1 Existing Conditions

The ethnic and racial composition of Montana, the five-county planning area, and individual counties in 2010 are displayed in **Table 3-61**, Population by Race and Ethnicity (2010). Montana's 2010 population was reported to be significantly less diverse than the general US population (74 percent white), with individuals identifying themselves as white accounting for 89 percent of the state's population. Shares of racial and ethnic minority groups at the state level, with the exception of American Indians, were less than their share of the overall US population. While Central Montana's population has a larger share of individuals identifying themselves as American Indian alone, American Indians living within

**Table 3-61**  
**Population by Race and Ethnicity (2010)**

	White <sup>1</sup>	Black or African American <sup>1</sup>	American Indian & Alaska Native <sup>1</sup>	Asian <sup>1</sup>	Native Hawaiian & Other Pacific Islander <sup>1</sup>	Some Other Race <sup>1</sup>	Two or More Race <sup>1</sup>	Hispanic (of any Race) <sup>1</sup>
<b>United States</b>	74.0%	12.5%	0.8%	4.7%	0.2%	5.5%	2.4%	15.7%
<b>Montana</b>	89.8%	0.4%	6.2%	0.6%	0.1%	0.6%	2.3%	2.8%
<b>Five-County Area</b>	91.2%	0.9%	6.0%	0.4%	0.1%	0.7%	0.7%	1.8%
Chouteau County	77.2%	0.4%	20.6%	0.2%	0.4%	0.1%	1.3%	1.6%
Fergus County	96.4%	1.2%	1.0%	0.4%	0.0%	0.7%	0.3%	1.4%
Judith Basin	96.4%	0.0%	0.0%	0.9%	0.0%	0.0%	0.8%	0.6%
Meagher County	96.3%	0.0%	0.5%	0.0%	0.0%	2.9%	0.3%	6.0%
Petroleum County	85.5%	7.9%	0.0%	0.0%	0.0%	1.5%	5.2%	3.0%

Source: Forest Service Enterprise 2013

<sup>1</sup> Race and ethnicity shares do not add to 100 percent because Hispanics can be of any race.

the five-county area represent 0.5 percent of the area's total population (US Department of Commerce 2012a). While the data indicates that the area has small shares of minority racial and ethnic groups, these populations do meet the CEQ's definition of minority populations.

As discussed above in **Section 3.22.1**, Chouteau, Meagher, and Petroleum counties had higher poverty rates for individuals and families than general poverty rates for the state and country. Thus, the census data indicates that low income populations, as defined by CEQ, do exist within the planning area.

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CHAPTER 4  
ENVIRONMENTAL CONSEQUENCES



# CHAPTER 4

## ENVIRONMENTAL CONSEQUENCES

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### 4.1 INTRODUCTION

This chapter presents the likely direct and indirect impacts on the human and natural environment that could occur from implementing the alternatives presented in **Chapter 2**. Cumulative impacts from the proposed alternatives are presented **Chapter 5**. This chapter is organized by topic, similar to **Chapter 3**. Each topic area includes a method of analysis section that identifies indicators, methods, and assumptions; a discussion of the nature and type of effects; a summary of effects common to all alternatives; and an analysis of impacts for each of the four alternatives. A separate section describing irretrievable or irreversible commitment of resources is presented at the end of the chapter. Indicators are factors that describe resource condition and change and can help the BLM determine trends over time. The section on methods and assumptions describes methodologies and assumptions for assessing impacts specific to the resource or resource use. These are in addition to those general assumptions and methodologies listed in **Section 4.1.1**, Analytical Assumptions, and **Section 4.1.2**, General Methodology for Analyzing Impacts. The nature and type of effects section describes in general terms impacts on resources or resource uses from allowable uses or restrictions on allowable uses. Impacts for each alternative describe how the indicators would change the magnitude of the nature and type of effect.

All management actions proposed in **Chapter 2** are primarily planning-level decisions and do not result in direct, on-the-ground changes. However, by planning for uses on BLM-administered surface estate and federal mineral estate during the planning horizon for the Judith Resource Area Resource Management Plan and Headwaters Resource Management Plan, this impact analysis focuses on impacts that could eventually result in on-the-ground changes. Impacts for some resources or resource uses, such as livestock grazing and OHV use, could be confined to the BLM-administered surface estate. Other impacts, such as energy and minerals and requirements to protect GRSG from such activity,

could apply to all BLM-administered federal mineral estate (including split estate). Some BLM management actions may affect only certain resources under certain alternatives. This impact analysis identifies impacts that may enhance or improve a resource as a result of management actions, as well as those impacts that have the potential to impair a resource. However, the evaluations are confined to the actions that have direct, immediate, and more prominent effects. If an activity or action is not addressed in a given section, no impacts are expected, or the impact is expected to be negligible based on professional judgment.

The BLM manages BLM-administered lands for multiple uses in accordance with FLPMA. Land use decisions are made to protect the resources while allowing for different uses of those resources, such as energy and mineral development, OHV use, recreation, and livestock grazing. When there are conflicts among resource uses or when a land use activity could result in unacceptable or irreversible impacts on the environment, the BLM may restrict or prohibit some land uses in specific areas. To ensure that the BLM meets its mandate of multiple use in land management actions, the impacts of the alternatives on resource uses are identified and assessed as part of the planning process. The projected impacts on land use activities and the environmental impacts of land uses are characterized and evaluated for each of the alternatives.

Impact analysis is a cause-and-effect process. The detailed impact analyses and conclusions are based on the BLM planning team's knowledge of resources and the project area; reviews of existing literature; and information provided by experts in the BLM, other agencies, and interest groups, as well as by concerned citizens. The baseline used for the impact analysis is the current condition or situation, as described in **Chapter 3**. Impacts on resources and resource uses are analyzed and discussed in detail commensurate with resource issues and concerns identified throughout the process. Occasionally, impacts are described using ranges of potential impacts or in qualitative terms.

#### **4.1.1 Analytical Assumptions**

Several assumptions were made to facilitate the analysis of the projected impacts. These assumptions set guidelines and provide reasonably foreseeable projected levels of development that would occur within the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area during the planning period. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative, as described in **Chapter 2**. The following general assumptions apply to all resource categories. Any specific resource assumptions are provided in the *Methods and Assumptions* section for that resource.

- Each alternative in **Chapter 2** constitutes a possible RMPA and would be implemented.

- Implementing actions from any of the RMPA alternatives would be in compliance with all valid existing rights, federal regulations, BLM policies, and other requirements.
- Implementation-level actions necessary to execute the land use plan-level decisions in this RMPA would be subject to further environmental review, including NEPA, as appropriate.
- Direct impacts of implementing the RMPA primarily occur on the decision area lands, and indirect impacts primarily occur on the decision area and adjacent private lands.
- Local climate patterns of historic record and related conditions for plant growth may change with warmer, drier conditions likely to occur throughout the life of the Judith Resource Area Resource Management Plan and Headwaters Resource Management Plan.
- In the future, as tools for predicting climate changes in the planning area improve and changes in climate affect resources and necessitate changes in how resources are managed, the BLM may reevaluate decisions made as part of this planning process and adjust management accordingly.
- The discussion of impacts is based on the best available data. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data are limited.
- RDFs apply to certain activities (i.e., water developments, mineral development, and fire fuels management) conducted by the BLM. Because the BLM does not have jurisdiction over split estate lands for activities not related to fluid mineral leasing and development, RFDs apply only to the 593,995 acres of BLM surface in the decision area.
- Restrictions on land use authorizations are identified for ROW avoidance or ROW exclusion areas. Because the BLM does not have jurisdiction over split estate lands for land use authorizations, ROW avoidance and ROW exclusion restrictions apply only to the 593,995 acres of BLM surface in the decision area.
- Data from GIS have been used in developing acreage calculations and to generate the figures in **Appendix A**. Calculations depend on the quality and availability of data. Most calculations in this RMPA are rounded to the nearest 10 acres or 0.1-mile. Given the scale of the analysis, the compatibility constraints between datasets, and lack of data for some resources, all calculations are approximate and are for comparison and analytic purposes only. Likewise, the figures in **Appendix A** are provided for illustrative purposes and are subject

to the limitations discussed above. The BLM may receive additional GIS data; therefore, acreages may be recalculated and revised.

#### 4.1.2 General Methodology for Analyzing Impacts

Potential impacts or effects are described in terms of type, context, duration, and intensity, which are generally defined as follows:

- *Type of Impact* – Because types of impacts can be interpreted differently by different people, this chapter does not differentiate between beneficial and adverse impacts (except in cases where such characterization is appropriate or required by law, regulation, or policy). The presentation of impacts for key planning issues is intended to provide the BLM decision maker and reader with an understanding of the multiple use tradeoffs associated with each alternative. The impact analysis presents the effects caused by an action and the reader is left to interpret if that is a beneficial or adverse impact. Different readers may interpret the effect as either adverse or beneficial.
- *Context* – Context describes the area or location (site specific, local, planning area wide or regional) in which the impact would occur. Site-specific impacts would occur at the location of the action, local impacts would occur within the general vicinity of the action area, planning area-wide impacts would affect a greater portion of the planning area, and regional impacts would extend beyond the planning area boundaries.
- *Duration* – Duration describes the length of time an effect would occur, either short term or long term. Short term is defined as anticipated to begin and end within the first five years after the action is implemented. Long term is defined as lasting beyond five years to the end of or beyond the planning time frame of the Judith Resource Area Resource Management Plan and Headwaters Resource Management Plan.
- *Intensity* – Rather than categorize impacts by intensity (e.g., major, moderate, and minor), this analysis discusses impacts using quantitative data wherever possible.
- *Direct and Indirect Impacts* – Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place. Indirect impacts result from implementing an action or alternative but usually occur later in time or are removed in distance and are reasonably certain to occur.

Analysis shown under Alternative A may be referenced in the other alternatives with such statements as “impacts would be the same as, or similar to, Alternative A” or “impacts would be the same as Alternative A, except for . . .” as applicable.

Irreversible and irretrievable commitment of resources is discussed in **Section 4.24, Irreversible and Irretrievable Commitment of Resources**. Irreversible commitments of resources result from actions in which resources are considered permanently changed. Irretrievable commitments of resources result from actions in which resources are considered permanently lost.

#### **4.1.3 Incomplete or Unavailable Information**

The CEQ established implementing regulations for NEPA, requiring that a federal agency identify relevant information that may be incomplete or unavailable for an evaluation of reasonably foreseeable significant adverse effects (40 CFR 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included, unless the cost of obtaining the information is exorbitant. Knowledge and information is, and would always be, incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the RMPA. Considerable effort has been taken to acquire and convert resource data from the BLM and outside sources into digital format for use in the RMPA.

Certain information was unavailable for use in developing this RMPA because inventories have either not been conducted or are incomplete. Some of the major types of data that are incomplete or unavailable include:

- Field inventory of soils and water conditions
- Field inventory of vegetation composition
- Field inventory of wildlife and special status species occurrence and condition

For these resources, estimates were made concerning the number, type, and significance of these resources based on previous surveys and existing knowledge. In addition, some impacts cannot be quantified given the proposed management actions. Where this gap occurs, impacts are projected in qualitative terms or, in some instances, are described as unknown. Subsequent project-level analysis will provide the opportunity to collect and examine site-specific inventory data required to determine appropriate application of RMP-level guidance. In addition, ongoing inventory efforts by the BLM and other agencies in the planning area continue to update and refine information used to implement this RMPA.

## **4.2 GREATER SAGE-GROUSE**

### **4.2.1 Methods and Assumptions**

#### ***Indicators***

Indicators of impacts on GRSG are as follows:

- Acres of sagebrush habitat
- Average male lek attendance for large, medium, and small leks

**Assumptions**

The analysis includes the following assumptions:

- Three general categories of human disturbance to habitats or disruption to animals would be the most influential on GRSG and their habitat: 1) disturbance/disruption from casual use; 2) disturbance/disruption from permitted activity; and 3) changes in habitat condition, such as from fire or weed invasion.
- BMPs, RDFs, COAs, and standard operating procedures are used for analysis and would be implemented to reduce impacts on GRSG. These are subject to modification, based on subsequent guidance and new science.
- Short-term effects are defined as those that would occur over a time frame of up to two years and long-term effects would occur over longer than two years.
- Ground-disturbing activities could positively or negatively modify habitat or cause loss or gain of individuals. This all depends on the amount of area disturbed, the nature of the disturbance, the species affected, and the location of the disturbance. For example, juniper reduction treatments disturb the ground but could positively modify habitat in the long term.
- Direct impacts of implementing the RMPA primarily occur on the decision area lands; indirect impacts of implementing the RMPA primarily occur on the decision area and adjacent land not administered by the BLM.
- Removing livestock grazing from BLM-administered land would result in private lands being fenced from BLM-administered land.
- Removing livestock grazing from BLM-administered land would result in pits, dams, and reservoirs being removed from BLM-administered land, or these structures would fail over time. For those that support fisheries, important riparian-wetland habitat could remain, but this is less than ten percent of the total pits, dams, and reservoirs.
- Under Alternative A, land tenure adjustments would be subject to current disposal/exchange/acquisition criteria. These include retaining lands with threatened or endangered species, high quality riparian habitat, or plant and animal populations or natural communities of high interest, including GRSG.

- Impact analysis focuses on the Yellowstone Watershed population, including the survey areas of Winifred, Crooked Creek, War Horse, and Yellow Water Triangle. Leks are categorized as large (more than 25 males), medium (fewer than 25 and more than 10 males), and small (fewer than 10 males).

#### 4.2.2 Nature and Type of Effects

Factors related to the decline in GRSG distribution and abundance throughout their range includes habitat loss and degradation, disease and predation, chemicals, and changes in land use (USFWS 2010a, p. 14). Habitat loss and fragmentation reduces the land area available to support GRSG and increases opportunities for other types of disturbance, such as predation, human traffic, wildfire, and spread of invasive plant species. The GRSG impacts section focuses on threats specifically identified for the Yellowstone Watershed population within the LFO: sagebrush elimination/agricultural conversion, fire, weed spread and conifer encroachment, energy, infrastructure, grazing, and recreation (USFWS 2013, p. 17).

Loss and fragmentation of sagebrush habitats is a primary cause of the decline of GRSG populations, (USFWS 2010a). Threats posed by conversion to agriculture, infrastructure, wildfire, invasive weeds, conifer encroachment, livestock grazing, and energy development are all associated with loss, fragmentation, and degradation of habitat. The reasons for declining GRSG populations are habitat fragmentation, reductions in lek persistence, lek attendance, population recruitment, yearling and adult annual survival, female nest site selection, nest initiation, and complete loss of leks and winter habitat (USFWS 2010a, p. 21).

#### ***Yellowstone Watershed and Belt Mountains GRSG Analysis***

The alternatives analysis in this chapter focuses on the Yellowstone Watershed population of GRSG. The LFO planning area also includes the Belt Mountain population area. Only 439 acres (0.1 percent) of this area is administered by the BLM, all in PGH, and no leks are located here; the nearest lek is 2.5 miles away. The major threats in this area are isolation, conversion to agriculture, conifer encroachment, and weed spread.

Most BLM-administered lands within the population are on the northern border of mapped habitat; these lands are experiencing conifer encroachment. The amount and location of BLM-administered habitat and the distance to leks prevents the BLM from meaningfully addressing COT report threats at the RMP level. In the short term, there would be no difference between alternatives for the amount of sagebrush or grassland habitat. In the long term, if conifer encroachment were not treated, approximately 120 acres would transition from sagebrush to Douglas-fir.

Alternative A would allow treatment in PGH and Alternatives C and D would allow treatment in GH, while Alternative B would prioritize treatments in PH. It

is unlikely that sagebrush habitats would be maintained on BLM-administered land in the Belt Mountains population under Alternative B.

***COT Report Threats—Sagebrush Elimination, Agriculture Conversion***

Over time, sagebrush habitats have been removed for crop production or development. Such conversion results in the loss of habitat and decreases the connectivity between seasonal habitat. This increases population isolation, which increases the probability for the loss of genetic diversity. This then increases the probability of extirpation from random events (Knick and Hanser 2011).

Habitat loss and fragmentation also increase opportunities for other disturbances, such as human traffic, wildfire, and invasive plant spread. While habitat conversion for agriculture is not directly tied to BLM management, land tenure decisions, such as acquisitions and disposals, can indirectly affect the acreage available for agriculture and urbanization. For example, if the BLM were to dispose of a parcel characterized as sagebrush-steppe, it could be converted to farmland or subdivided into home sites. Lands retained under BLM management would not be converted for agriculture or urbanization. In Montana, large leks are 4.5 times less likely to occur than small leks when tilling fragments 21 percent or more of land within a 0.6-mile radius of breeding sites (Tack 2009).

The continuing pressure for conversion of private rangeland to agricultural land or residential development in LFO poses increasing risks of habitat fragmentation, particularly given the patchwork of land ownership in the area. Temperature increases from climate change may increase crop yields, which may encourage parts of the state not previously used for agriculture to be converted for that purpose (NRC 2010).

*Impacts from ACECs*

Special designations (e.g., ACECs, Wilderness, and WSAs) and other conservation measures could be established to protect GRSG and their habitats. However, this GRSG-specific amendment includes special management prescriptions that provide broad protection from habitat fragmentation, loss, and human disturbance. No additional protection would be afforded with ACEC designation. Existing special designations may protect GRSG or their habitat, but they were not established for this purpose.

***COT Report Threats—Fire***

Fire is particularly damaging to Wyoming big sagebrush, which is most of the sagebrush habitat in the LFO. Big sagebrush, unlike silver sagebrush, does not resprout after a fire; instead, it is replenished by wind-dispersed seed from adjacent unburned stands or seeds in the soil. Depending on the species and the size of a burn, sagebrush can reestablish itself within five years of a burn. However, a return to a full pre-burn community cover can take 13 to 100 years (Connelly et al. 2004). While wildfire likely played an important historical role in creating a mosaic of habitat for GRSG, current land use patterns have restricted

the system's ability to support wildfire. Slow rates of regrowth and recovery of sagebrush after disturbance, coupled with high rates of disturbance and conversion to introduced plant cover, are largely responsible for the accumulating displacement and degradation of the sagebrush ecosystem (Manier et al. 2013, pp. 4-6). Climate change is expected to increase the risk of wildfire throughout Montana (NRC 2010).

Fire suppression may be used to maintain habitat for GRSG (NTT 2011, pp. 25-27). Fire suppression may preserve the condition of some vegetation communities, as well as habitat connectivity. This is particularly important in areas where fire frequency has increased as a result of weed invasion or where landscapes are highly fragmented. Fire also increases opportunities for invasive species, such as cheatgrass (*Bromus tectorum*), to expand (Balch et al. 2012); fire suppression may limit this expansion. In the LFO, cheatgrass is not widespread, though isolated patches may be found. Propensity to wildfire is less in the LFO planning area than in the Great Basin region of the Yellowstone Watershed population area, due to the planning area's cooler and wetter climate.

Controlled burning may be prescribed to treat fuel buildup and can help sagebrush habitat recover in some vegetation types, especially when silver sagebrush is undergoing conifer encroachment. Reseeding with native plants and long-term monitoring to ensure the production of GRSG cover and forage plants, would assist vegetation recovery (NTT 2011, pp. 26-27). In the LFO, controlled burning is used primarily in ponderosa pine areas to limit conifer spread and is not used in GRSG habitat.

***COT Report Threat—Vegetation Management (Conifers, Weeds, and Annual Grasses)***

Current treatments and active vegetation management typically focus on vegetation composition and structure for fuels. Habitat management and productivity manipulation also are used to improve habitat and forage for ungulates and other grazers. An example of this is soil stabilization to manipulate vegetation composition, to increase productivity, or to remove invasive plants (Knick et al. 2011). Distribution of these treatments can affect the distribution of GRSG and sagebrush habitats locally and across a region.

Invasive plants are thought to alter plant community structure and composition, productivity, nutrient cycling, and hydrology. They may outcompete native plant populations. In particular, invasive plants can reduce and eliminate vegetation that GRSG use for food and cover, resulting in habitat loss and fragmentation. Invasive plants also may increase the risk of wildfire. An assortment of nonnative annuals and perennials and native conifers are currently invading sagebrush ecosystems.

Expansion of conifer woodlands, especially juniper (*Juniperus* spp.), also threatens GRSG. This is because conifers do not provide suitable habitat, and mature trees displace shrubs, grasses, and forbs required for GRSG through

competition for resources. Juniper expansion is also associated with increased bare ground, the potential for erosion, and additional perch sites for raptors. For these reasons, woodland expansion may also represent expansion of raptor predation threat, in ways similar to perches on power lines and other structures (Connelly et al. 2004).

Landscapes with large, intact patches of sagebrush are preferred to avoid edge effects. In addition, GRSG require habitats that include a diversity of herbaceous species and healthy native grasses, making management for high condition important (Knick et al. 2011).

The distribution of sagebrush is limited, and the cost of habitat restoration is high. For these reasons, management plans that protect intact sagebrush and restore impacted areas strategically to increase connectivity of intact sagebrush have the best chance of increasing high quality sagebrush cover (Connelly et al. 2004; Beck and Mitchell 2000, cited in Manier et al. 2013, p. 108). Sagebrush-promoting vegetation treatments would increase the amount and quality of GRSG habitat.

Managing and controlling invasive weed species in GRSG habitat would decrease the spread of weeds that directly compete for resources such as water with native plants and that indirectly increase the risk of fire, such as from cheatgrass, impacts on sagebrush. To reduce the likelihood of invasive weed spread and the extent of current infestations, the BLM uses integrated weed management techniques through weed control cooperative range improvement agreements. The BLM implements vegetation treatments, such as mechanical, chemical, hand-cutting, and prescribed burning, to reduce weed infestations and conifer encroachments.

These conservation efforts would reduce the impacts of weeds or conifers on sagebrush and would increase the availability of GRSG habitat. In addition, fuels management actions, as described above, can also reduce weeds and conifers and create fire breaks.

Indicators of potential impacts on GRSG from invasive plants and conifers under the proposed alternatives are acres of sagebrush habitat and acres meeting rangeland health standards.

#### ***COT Report Threat—Energy***

Energy development requires construction of roads, well pads, wells, and other infrastructure, with associated noise, traffic and lights. These improvements disturb wildlife and alter, degrade, or displace native ecosystems. Wildlife is displaced by energy development infrastructure, with power lines and roads having the largest effects, according to a meta-analysis of prairie grouse populations. Population declines associated with energy development result from the abandonment of leks, decreased attendance at the leks that persist, lower nest initiation, poor nest success, decreased yearling survival, and

avoidance of energy infrastructure in important wintering habitat (Holloran 2005; Aldridge and Boyce 2007).

Industrial activity to develop surface mines and infrastructure could result in noise and human activity that disrupt the habitat and life cycle of GRSG. The number of displaying GRSG on two leks within 1.25 miles of active mines in northern Colorado declined by approximately 94 percent. This was over a five-year period following an increase in mining activity, though limited recovery occurred subsequently (Remington and Braun 1991, cited in Manier et al. 2013, p. 71; Braun 1998).

All studies which assessed impacts of energy development on GRSG found negative effects, whereas no studies reported a positive influence of development on populations or habitats (Naugle et al. 2011). Research has reported that breeding populations of GRSG were negatively impacted, with declines in lek attendance by male GRSG ranging from 13 to 79 percent at conventional well pad densities. This was defined in the study as four to eight pads per square mile; within the planning area conventional well pad density is one per square mile (640 acres). A recent summary of studies investigating GRSG response to natural gas development reported impacts on leks from energy development were most severe when infrastructure occurred near leks and that impacts remained discernible out to distances up to four miles (Naugle et al. 2011; Manier et al. 2013, p. 51).

An observed 21 percent decline in GRSG population between pre- and post-mine development was primarily attributed to decreased nest success and adult female annual survival; the treatment effect was more noticeable closer to gas field infrastructure.

Annual survival of individuals reared near gas field infrastructure (yearling females and males) was significantly lower than control individuals that were not reared near infrastructure (Holloran et al. 2010, cited in Manier et al. p. 59). Generally, oil and gas developments within two to four miles of leks or nesting areas had a deleterious effect on populations; the effect increased as well density increased (Lyon and Anderson 2003; Walker et al. 2007; Johnson et al. 2011). Knick and Connelly (2011) found that burned areas and human disturbance were the primary factors influencing the fate of leks.

Current oil and gas leases are substantial across GRSG ranges in MZ I, though oil and gas leasing is inactive on BLM-administered lands in PH and GH within the LFO. The potential for development is based on locations of geologic fields for traditional oil and gas, distributed extensively across eastern portions of GRSG range (Manier et al. 2013, p. 51). LFO is not leasing any parcels for fluid minerals in PH or GH under any alternative. Private lands are being leased; however, three wells targeting the Heath formation less than two years ago are currently being removed, and additional wells are not expected.

A lease does not guarantee development; a separate environmental review process is conducted before permission is given to drill. Oil and gas leasing is not currently active in the LFO area but could become prevalent in the future, depending on market conditions.

Restrictions on mineral leasing in GRSG habitat would reduce impacts on the species by reducing the disturbances described above.

**COT Report Threat—Grazing and Range Management**

Livestock grazing is the most widespread land management practice in western North America; 70 percent of all lands are grazed (Floyd et al. 2003). Cattle grazing is also the dominant agricultural use in the LFO. Since the early 1900s, livestock use on public lands has declined.

Simultaneously with reduced stocking of public rangelands has been measurable improvements in range condition during the latter half of the 1900s (Box 1990; Laycock et al. 1996). The focus of rangeland management on livestock production has been shifting since the 1960s and 1970s toward conservation, ecosystem integrity and services, sustainable use of resources for multiple purposes, the restoration of degraded rangelands, and benefits for wildlife (Connelly et al. 2004; Vavra 2005; Briske et al. 2011; Knick et al. 2011). The mere presence of livestock does not mean that long-term destruction is occurring to wildlife or habitat. Instead, the degree to which grazing affects habitat depends on the number of animals grazing in an area, the time of grazing, and the grazing system used.

Although the Great Plains ecosystems evolved under grazing pressures from hoofed ungulates, the seasonality and intensity of domestic livestock grazing under current grazing management may differ from historic bison and elk grazing. The impact of grazing on these communities varies with site potential, ecological condition, and climate. If not managed optimally or effectively, cattle and sheep grazing can cause soil compaction, nutrient enrichment, vegetation and nest trampling, direct disturbance, and negative effects on GRSG recruitment (Connelly et al. 2004 pp.7-29 –7-32). This would result from livestock reducing invertebrate prey or increasing GRSG exposure to predators (Beck and Mitchell 2000, pp. 998-1000; Knick 2011; Coates 2007, pp. 28-33).

Impacts on habitat vary with livestock densities and distribution: the more evenly livestock are distributed, the lower their impact on any given area (Gillen et al. 1984). However, cattle show a strong preference for certain areas, leading to high use in some areas and little to no use in others. In general, livestock use is limited by slopes greater than 30 percent, dense forests and vegetation, poor or little upland forage, and lack of water.

GRSG habitat structure and composition may be affected positively or negatively by livestock grazing (Crawford et al. 2004). Forage utilization standards and guidelines, such as BLM Standards for Rangeland Health, were

developed to identify, with proper management, future conditions of rangeland resources.

Properly managed livestock grazing, permitted within standard and guideline limits (as specified in the LFO standards for rangeland health in **Appendix F**), is designed to cause no adverse impacts on rangeland or habitat values. Grazing plans designed to improve fair and poor condition range with rest periods may increase herbaceous cover and concurrently GRSG habitat (Adams et al. 2004).

Changing the timing of grazing to promote grass and forb growth, and residual matter, also benefits GRSG habitat (Woodward 2006). Light grazing may produce mosaics in sagebrush communities and increase grass and forb production needed for nesting and brood-rearing (Adams et al. 2004). Light to moderate grazing does not appear to affect cover of perennial grasses important to nest cover (Strand and Launchbaugh 2013; Reisner et al. 2013).

Areas with excessive utilization for a number of years have negatively impacted GRSG habitat. The situation has created conditions that favor annual grass dominance and reduce perennial grasses used as nesting and escape cover (Beck and Mitchell 2000). Periodic overgrazing can damage range resources for the long term. It often exacerbates drought effects when livestock levels are not reduced to match the limited forage production.

Livestock's heavy use of riparian meadows reduces the availability of succulent forbs and may cause GRSG to avoid these habitats (Klebenow 1982). Livestock may also trample nests and disturb GRSG behavior (Beck and Mitchell 2000; Coates 2007, pp.28-33).

Grazing in riparian areas can destabilize streams and river banks, reduce riparian shade, and increase sediment and nutrient loads in the aquatic ecosystem. Timing of grazing influences effects on meadows and riparian areas. Meadow and riparian areas within sagebrush habitat in good condition can withstand moderate spring, early summer, or winter use (Shaw 1992; Clary et al. 1996; Mosley et al. 1997). The length of time livestock access meadows may be more important than the level of use (Mosley et al. 1997). Rest from grazing may be necessary to restore degraded riparian and meadow habitat (Clary and Webster 1989).

Grazing infrastructure, such as water features and pipelines for livestock, can attract livestock to previously undisturbed habitat areas. This artificially concentrates livestock impacts, such as heavy grazing and vegetation trampling (Braun 1998). Standing water for livestock can create puddles that serve as breeding grounds for mosquitoes that carry West Nile virus (Walker and Naugle 2011). Fences provide predator perches and are a cause of direct mortality to GRSG (Braun 1998; Stevens et al. 2012). Grazing management that provides for sagebrush ecosystem health would enhance habitat for GRSG populations.

Birds and other wildlife species do not respond to grazing directly but to habitat changes. In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. As a result, livestock grazing could change habitat and alter species abundances and composition in GRSG insect prey. Changes could occur in varying degrees in plant composition and change in vegetative structure, affecting cover for nesting birds. Grazing could also alter fire regimes (Davies et al. 2010) to varying degrees.

Grazing can reduce the spread of invasive grasses, if applied annually before the grasses have cured, and can be used as a tool to reduce fuel load (Connelly et al. 2004, pp. 7, 28-30).

### **COT Report Threat—Infrastructure**

#### *Impacts from Lands and Realty*

Transmission lines and major power lines are widespread throughout GRSG range. GRSG respond negatively to increased human infrastructure in sagebrush habitats, including roads, power lines, and communication towers (Knick and Connelly 2011; Johnson et al. 2011). Although transmission line and power line construction does not generally result in substantial direct habitat loss, it would temporally disturb individual GRSG and habitat along the ROW.

Following construction, GRSG avoidance of vertical structures, likely due to raptors perching on them, may result in habitat exclusion via behavioral response. One study reported that the frequency of raptor/GRSG interactions during the breeding season increased 65 percent and golden eagle interactions alone increased 47 percent where a transmission line had been constructed (Ellis 1985). GRSG have been observed to avoid brood-rearing habitats within three miles of power lines (LeBeau 2012). Higher densities of power lines within four miles of a lek negatively influence lek attendance (Walker et al. 2007).

ROW exclusion areas would prohibit all development of ROWs, while in ROW avoidance areas, whether a ROW should be allowed would be considered on a case-by-case basis. This flexibility may be advantageous where federal and private landownership areas are mixed; exclusion areas may result in more widespread development on private lands.

#### *Impacts from Travel and Transportation Management*

Ecological impacts of roads and motorized trails include mortality due to collisions, behavior modifications due to noise, activity, and habitat loss, physical environment alteration, nutrient leaching, erosion, invasive plant spread, increased use, and alteration of habitat by humans accessing it. GRSG avoid nesting and summering near major roads (for example, paved secondary highways) and traffic disturbances. Research suggests that roads within 4.7 miles of leks negatively influence male lek attendance, with larger roads having greater effects (Connelly et al. 2004; Johnson et al. 2011). Negative influences on male lek attendance are increased road length and traffic levels on roads and traffic

activity during the early morning on roads within approximately two miles of leks (Holloran 2005; LeBeau 2012; Forman and Alexander 1998; Lyon and Anderson 2003, cited in Manier et al. 2013, pp. 44 and 50).

Closing and reclaiming unused, minimally used, or unnecessary roads in and around GRSG habitat would reduce disturbance to GRSG in those habitats. It also would increase the amount of GRSG habitat when the roads are reclaimed (NTT 2011, p. 11).

***COT Report Threat—Recreation***

Recreation in GRSG habitat is benign in most situations, but excessive use may disturb birds or nesting sites, degrade sagebrush habitat, or allow poaching (NTT 2011, p. 12). Activities such as camping, bicycling, OHV use, and hunting make use of the extensive network of BLM roads and trails. These activities impact sagebrush and GRSG by generating noise and dust, spreading invasive plants, and altering wildlife behavior (Knick et al. 2011). In addition, road and trail use may directly cause GRSG mortality via collisions with vehicles.

Closing or seasonally restricting roads used by recreationists in and around seasonal GRSG habitats may reduce the impacts on wildlife. Restricting permitted access to important habitat areas based on seasonal use and coincident with GRSG activities would also protect GRSG (Knick et al. 2011; NTT 2011, p. 11).

**4.2.3 Alternative A**

***COT Report Threats—Sagebrush Elimination, Agriculture Conversion***

*Impacts from Land Tenure Decisions*

Land tenure adjustments would be subject to current disposal, exchange, and acquisition criteria. These include retaining lands with threatened or endangered species, high quality riparian habitat, or plant and animal populations or natural communities of high interest. This would likely include retaining or protecting areas with GRSG and would thus maintain occupied habitats. Thus, management under existing land tenure criteria would likely retain GRSG habitat and other lands with high value to wildlife.

***COT Report Threat—Fire***

*Impacts from Fire and Fuels Management*

As shown in **Section 3.6**, under current management, 168,700 acres of GRSG habitat on BLM-administered land are at high risk of wildfire. Fuels treatment may reduce the risk by mechanical means or prescribed fire.

Prescribed burning may also be used in support of resource management objectives, such as restoring grassland or shrubland, reducing conifer encroachment, or increasing age-class variety. The intention of prescribed

burning is to improve wildlife habitat and vegetation production. Sagebrush treatments are designed to maintain sagebrush within the canopy at 15 to 50 percent and to increase succulent forbs in order to improve forage for GRSG and increase population stability. Chemical weed treatments may be applied following prescribed burns to limit the expansion of weeds or invasive species in the burned area.

Rest periods following wildfire or controlled burn are determined on a site-specific basis. Intensive wildfire suppression would be applied to high-value areas, such as sagebrush, fire-sensitive woody riparian areas, and commercial forests. Continuation of this policy would protect sagebrush acreage, but high risks of wildfire would remain in some areas.

#### ***COT Report Threats—Vegetation Management (Conifers and Weeds and Annual Grasses)***

As shown in **Section 3.5**, 516,000 acres of BLM-managed GRSG habitat in the planning area has high potential for cheatgrass spread. Under Alternative A, current vegetation management would continue. Grazing methods, land treatments, and other improvements would be designed and monitored to accomplish objectives, including wildlife habitat needs. Noxious weed control would be the responsibility of the affected permittee and lessee under existing weed control cooperative range improvement agreements. Each year, permittees and lessees would provide the BLM with records and maps of treatment areas. Conifer removal projects would continue using mechanical means and controlled burns. These approaches would continue to be effective in combating the spread of weeds and conifers, subject to budget limitations.

#### ***COT Report Threats—Energy***

##### *Impacts from Fluid Minerals*

Mineral exploration and extraction directly disturbs GRSG and degrades their habitat, as described under *Nature and Type of Effects*. Existing leases cover 89,761 acres in the planning area, 45,400 acres of which are in BLM-administered PPH and PGH. This acreage would remain the same across all the alternatives.

Under Alternative A, fluid mineral leasing and development would continue on previously leased lands, though not all leased areas would ultimately be developed. Under current rates of development, no new wells would be drilled on previously leased land in the coming decade. Additional widespread lease development in the LFO is not expected.

##### *Impacts from Solid Minerals*

Before coal exploration licenses or prospecting permits for nonenergy leasable minerals were approved, environmental review would be required to assess impacts and develop mitigation measures. Generally, surface occupancy is prohibited within key wildlife areas, floodplains, and public ROWs. There are no

known coal resources in the planning area; therefore, actions associated with coal extraction would not impact GRSG populations.

For locatable minerals, mitigation measures to prevent unnecessary degradation would continue to apply to the proposed Plan of Operations. The BLM would consider purchasing claims where activities threaten resource values, such as wildlife habitat. These policies are unlikely to impact GRSG due to the lack of mining in the LFO; as discussed in **Section 3.9**, no locatable mineral development potential has been identified within GRSG habitat in the current RMPs.

### **COT Report Threat—Infrastructure**

#### *Impacts from Lands and Realty*

Under Alternative A, ROWs are considered on a case-by-case basis outside of exclusion and avoidance areas, with policy being to collocate when possible. There are no ROW exclusion areas within the planning area, but there are two avoidance areas, Acid Shale Pine Forest ACEC and Judith River Canyon (9,708 acres total, 2,463 acres of which are in GRSG habitat, as shown in **Section 4.13**, Areas of Critical Environmental Concern). The collocation approach provides limited protection for GRSG habitat from ROW construction, which is a cause of fragmentation. **Table 4-1**, ROW Exclusion and Avoidance Areas in GRSG Habitat (PH and GH), shows ROW avoidance and exclusion areas under each alternative.

**Table 4-1**  
**ROW Exclusion and Avoidance Areas in GRSG Habitat (PH and GH)**

<b>Resource Use</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW avoidance area (acres)	0	112,341	0	240,464
ROW exclusion area (acres)	0	233,219	345,560	0

Note: Exclusion and avoidance areas in are PH and GH for Alternatives B-D, and in PPH and PGH for Alternative A (since no PH or GH is presently designated).

### **COT Report Threats—Grazing and Range Management**

#### *Impacts from Range Management*

As shown in **Table 4-2**, Acres and AUMs Available for Grazing in the Planning Area in GRSG Habitat, currently, 570,112 acres in the planning area are open for livestock grazing, with 103,806 acres available AUMs. There are 6,781 acres closed to livestock grazing. Current livestock grazing was a significant causal factor for not achieving land health standards in 78 (54 allotments within GRSG habitat) of the 526 allotments within the planning area.

**Table 4-2**  
**Acres and AUMs Available for Grazing in the Planning Area in GRSG Habitat**

<b>Resource Use</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Available AUMs	103,806	103,806	34,398	103,806
AUMs in GRSG habitat (PH and GH)	69,408	69,408	0	69,408
Acres open to grazing	570,112	570,112	232,947	570,112
Acres open to grazing in PH and GH	337,165	337,165	0	337,165

Note: PH and GH are for Alternatives B, C, and D, and PPH and PGH are for Alternative A (since no PH or GH is presently designated).

In accordance with BLM grazing regulations 43 CFR, Part 4180, policy and guidance, the LFO has changed livestock grazing management on the 105,437 acres of PPH and PGH (see **Table 3-45**) that were not meeting land health standards due to current livestock grazing. The actions taken should allow GRSG habitat to improve by reducing the negative impacts.

At this time the LFO cannot quantify through monitoring that the management changes implemented on these lands have resulted in the acres achieving land health standards; however, management changes were implemented. If future land health evaluations and determinations indicate that lands are still not achieving standards, further action in accordance with grazing regulations (regulatory mechanisms) and BLM policy and guidance would be required.

Under Alternative A, livestock grazing would continue to be managed through existing grazing plans. When grazing regimens are implemented, methods and guidelines from the existing RMPs would be followed to maintain ecological conditions and enhance wildlife habitat and vegetation production. Monitoring would be used to maintain the effectiveness of grazing management practices, and integrated ranch planning may be used to plan allotments as single units.

Land health assessments and other management evaluations aim to meet rangeland health standards, which would provide for the health of rangeland vegetation that supports GRSG and other wildlife. Range improvements would be designed to meet both wildlife and range objectives and fences would be built or modified to permit passage of wildlife and to minimize GRSG fence collision risks.

The acreage in PPH found to not be meeting standards would continue to be managed to achieve the standards, which would improve its usefulness as GRSG habitat. Restricting livestock from riparian areas would enhance riparian habitat for wildlife, including GRSG.

### **COT Report Threat—Recreation**

#### *Impacts from Recreation*

Alternative A includes no specific recreation plan related to GRSG or their habitat. This means that uncontrolled recreation would continue and could increase in GRSG habitat. Although most recreation is benign, hunting, camping, and bird watching may disturb individual GRSG.

Recreation is an important use of BLM roads. As shown in **Table 3.35** in **Section 3.11**, Comprehensive Travel and Transportation Management, there are currently 773 miles of roads on BLM-administered land in PPH and PGH.

Under Alternative A, BLM-administered lands would continue to permit limited yearlong use for motorized vehicles. Recreation on wildlife habitat may disturb GRSG, may reduce nest success, and may contribute to habitat fragmentation. Under Alternative A, road and trail development is minimized in crucial big game and upland bird habitat. Roads may be closed to vehicles where substantial resource impacts occur, including harm to wildlife or habitat. These policies may limit disturbance of GRSG habitat during the nesting season.

#### **Summary of Direct and Indirect Effects on GRSG in the Planning Area under Alternative A**

As discussed in **Chapter 3**, the Yellowstone Watershed GRSG population contains five GRSG priority habitat areas within the Billings, Miles City, and Lewistown BLM field offices. PPH within the LFO is made up of Yellow Water Triangle, War Horse, Crooked Creek, and Winifred. **Table 3-5** shows lek size data for these survey areas.

The Winifred survey area contains more agricultural land (11 percent) than any other PPH area in the LFO. Any further loss of habitat, regardless of ownership, would likely decrease lek size and population numbers. No further loss of sagebrush habitat on BLM-administered land is expected in this area. The two large leks in the Winifred survey area have declined in size over the monitoring period and are presently just over the 25 GRSG threshold separating large from medium-size leks.

The number of large leks in Crooked Creek (one), War Horse (six), and Yellow Water Triangle (two) are expected to be maintained, assuming no changes to private lands or West Nile virus outbreaks. Habitats with more extensive agricultural production are more impacted (higher GRSG population declines) during West Nile virus outbreaks (Taylor et al. 2010).

The NRCS in both Fergus and Petroleum Counties is working with producers on private and public lands as part of the SGI to improve GRSG habitat. This would continue under all alternatives, as would fence marking on high collision risk fences within 1.25 miles of leks.

The total number of leks and large leks has declined over the course of data collection (see **Diagrams 3.1** and **3.2** in **Section 3.3**), with 2012/2013 representing the lowest counts since surveys began in the 1950s. GRSG habitat on state and private lands would remain in the long term. Assuming this, the BLM would take the following corrective actions for grazing management on allotments not meeting rangeland health standards due to current livestock management (40 percent of PPH):

- Fence marking in conjunction with NRCS
- Deferring all oil and gas leases in PPH or PGH
- Wildfire suppression

Under Alternative A, these measures could stabilize GRSG numbers in the short term and maintain numbers in the long term. This would be especially true in the War Horse and Yellow Water Triangle survey areas, where a greater amount of BLM-administrated lands occur.

Grazing would be managed to meet rangeland health standards, which include GRSG habitat as part of the biodiversity standard. Continued grazing would reduce the amount of fine fuels and fires over the next decade. This would likely be similar to what has occurred over the previous decade (less than 2,000 acres burned in BLM PPH).

Continued grazing would also require permittees to continue to treat noxious weeds on BLM allotments. Land use patterns, weather, and West Nile virus would continue to play important roles in recruitment and survival rates for both chicks and adults. Recreation effects would continue to be minimal and benign, as described above.

#### **4.2.4 Alternative B**

##### ***COT Report Threats—Sagebrush Elimination, Agriculture Conversion***

###### *Impacts from Land Tenure Decisions*

No lands in PH would be available for disposal under Alternative B. As discussed above, current disposal, exchange, and acquisition criteria would include retaining lands with threatened or endangered species, high quality riparian habitat, or plant and animal populations or natural communities of high interest. Thus, Alternative B would not change the likelihood of habitat conversion to agriculture or other uses. Because of the unlikely conversion of land under this alternative, sagebrush habitat would not be removed from BLM administration, resulting in no loss of PH on BLM-administered lands.

### **COT Report Threat—Fire**

#### *Impacts from Fire and Fuels Management*

Fire and fuels management actions proposed under Alternative B would specifically protect mature sagebrush acreage and GRSG from wildfire and prescribed burning. As under Alternative A, the trend of nearly 2,000 acres burned annually between 2000 and 2012 would be expected to continue over the next 10 years.

The approach to prescribed fire would be as described under Alternative A. Fuels treatments would be designed and implemented with an emphasis on promoting sagebrush. Sagebrush canopy would not be reduced below 15 percent unless fuels management objectives required it. Seasonal restrictions would be applied to fuels management. Rest periods also would be required and invasive species would be controlled with native seeds wherever possible. Fire suppression would be prioritized in PH and GH, potentially leading to fine fuel buildup. Grazing livestock would be an option to reduce fine fuel load.

The impacts under Alternative B would likely be the same as those under Alternatives A and D.

### **COT Report Threats—Vegetation Management (Conifers and Weeds/Annual Grasses)**

#### *Impacts from Habitat Restoration and Vegetation Management*

Current management programs (Alternative A) were already designed to reduce weeds and conifer spread, which benefit GRSG habitat. Habitat restoration and vegetation management actions under Alternative B would additionally improve GRSG habitat and prioritize restoration to benefit PH compared to Alternative A. As a result, the restoration and management of vegetation actions would focus on GRSG habitat more than Alternative A. It would do this by requiring the use of native seeds, designing post-restoration management to ensure the long-term persistence of restoration, considering changes in climate, and monitoring and controlling invasive species.

### **COT Report Threats—Energy**

#### *Impacts from Fluid Minerals*

Geophysical exploration would be allowed within PH but only for obtaining information on fluid mineral resources in areas outside of PH. Impacts on GRSG and their habitat could continue as a result of existing fluid mineral leases (44,500 acres in PH and GH); however, no new wells are likely to be drilled on BLM-administered land in the next decade.

In the event of new permits to drill, additional RDFs and conservation measures would be applied to existing leases as COAs. In comparison to Alternative A, these additional measures would result in potential beneficial impacts related to

drilling. Under current forecasts, no drilling is anticipated, so there would be no change in impacts on GRSG.

#### *Impacts from Solid Minerals*

Alternative B would find all surface mining of coal to be unsuitable in PH. In LFO there are no coal potential or existing lease areas. For locatable minerals, areas in PH would be proposed for withdrawal from mineral entry based on risk to GRSG habitat. Existing claims would be subject to potential buyout. Currently there is no coal potential and limited locatable mineral mining in the planning area; therefore, these actions would have little to no impact on GRSG populations or habitat, relative to Alternative A.

#### **COT Report Threat—Infrastructure**

##### *Impacts from Lands and Realty*

PH would be managed as ROW exclusion areas (233,219 acres), with limited exceptions, and GH would be managed as ROW avoidance areas (112,341 acres; **Table 4-1**). ROW exclusion areas would protect GRSG habitat and reduce habitat fragmentation on BLM-administered lands, as described above under *Nature and Type of Effects*. However, impacts on GRSG would still continue to occur on non-BLM lands in the LFO. As shown in **Table 4-6**, ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres), in **Section 4.4**, Vegetation (Including Noxious Weeds; Riparian and Wetlands), below, more sagebrush habitat is on land not administered by the BLM (863,565 acres) compared to 256,052 acres BLM-administered land. This suggests that ROW exclusion and avoidance areas may impact more GRSG habitat if development is potentially pushed onto private land.

#### **COT Report Threats—Grazing and Range Management**

##### *Impacts from Range Management*

Under Alternative B, the amount of PH and GH open for livestock grazing and available AUMs is the same as under Alternative A (**Table 4-2**). Noxious weed control would be the same as under Alternative A. Impacts on GRSG habitat from grazing, as described under *Nature and Types of Effects*, would continue under Alternative B. However, AMPs, integrated ranch planning, and land health assessments in PH would be used to incorporate GRSG management objectives into grazing permit renewals. These policies would likely increase the protection and quality of GRSG habitat on grazing lands, compared to current policy (Alternative A). They could increase GRSG populations compared to Alternative A.

**COT Report Threat—Recreation***Impacts from Recreation*

Under Alternative B, SRPs would be issued in habitat areas only where the effects of recreation were neutral or beneficial to GRSG habitat. The BLM would continue to limit motorized vehicles to existing roads and trails until travel management planning is complete. Route construction in PH would be limited to realignments or built to minimum standards necessary. During the breeding season, recreation permits would not be issued in the vicinity of leks to promote nesting success.

These policies would protect GRSG by limiting disturbance of GRSG habitat from activities associated with recreational vehicle traffic. However, impacts from dispersed recreation, such as hiking or camping, would likely continue to disturb individual GRSG in areas where they occur.

**Summary of Direct and Indirect Effects on GRSG in the Planning Area Under Alternative B**

Grazing and noxious weed control under Alternative B would be similar to Alternative A. Direct effects from ROW exclusion areas within PH would be reduced on BLM-administered lands; however, this could result in much greater infrastructure impacts on adjacent private lands, especially in the War Horse, eastern Crooked Creek, and Yellow Water Triangle areas. This would be due to the checkerboard nature and variety of ownerships within PH (974,735 acres) and GH (899,659 acres). See **Section 4.3**, Lands and Realty, for more information on land ownership patterns in ROW avoidance and exclusion areas. Moving ROW impacts to private lands could prove especially detrimental for GRSG since no RDFs would be required by the BLM there. The sparsity of BLM-administered land in Winifred would likely have negligible potential indirect impacts on private lands as a result of ROW exclusion areas. Over the long term, ROW exclusion areas on BLM-administered land would likely decrease the number of large and medium leks in the planning area, especially War Horse and Yellow Water Triangle due to the potential effect of pushing development onto adjacent private lands with less management oversight. Because more sagebrush habitat is on land not administered by the BLM, development may impact more leks if pushed onto private land.

The human population in PH in Fergus and Petroleum Counties is sparse, so impacts from the ROW exclusion areas would be limited. Functioning habitat would increase as a result of vegetation treatments prioritized in PH, especially mechanized treatments targeting conifer encroachment. Designating routes as part of travel management would improve GRSG habitat long term once the plan is implemented. Short-term GRSG numbers would be expected to improve until negative impacts associated with long-term ROW exclusion areas are realized.

#### 4.2.5 Alternative C

##### **COT Report Threats—Sagebrush Elimination, Agriculture Conversion**

###### *Impacts from Land Tenure Decisions*

No lands in PH or GH would be available for disposal under Alternative C. As discussed above, current disposal, exchange, and acquisition criteria already include retaining lands with threatened or endangered species, high quality riparian habitat, or plant and animal populations and natural communities of high interest.

Private land may be acquired to enhance GRSG conservation value of existing lands. Although it is uncertain how much private land could be acquired to enhance GRSG habitat under Alternative C, this policy could increase the BLM acreage of sagebrush compared to Alternatives A, B and D, but impacts are likely to be minimal.

###### *Impacts from Range Management*

An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for GRSG that inhabit rangeland outside of BLM-administered lands.

###### **Impacts from ACECs**

ACECs to protect GRSG would be designated as sagebrush reserves in PH, consisting of contiguous blocks of at least 4,000-acre blocks of BLM-administered land, covering 96,246 acres. No additional protections would occur for GRSG with an ACEC designation since all conservation measures would be applied to both PH and GH under Alternative C. In addition, the ACEC designation could attract increased hunting for GRSG.

##### **COT Report Threat—Fire**

###### *Impacts from Fire and Fuels Management*

The approach for fire suppression and emergency stabilization projects is as described under Alternative B. Additional policies would be included to ensure the availability of native seed. Relative to Alternatives A, B and D, fire suppression in sagebrush areas would be less effective since fine fuels would increase without livestock grazing.

##### **COT Report Threats—Vegetation Management (Conifers and Weeds/Annual Grasses)**

###### *Impacts from Habitat Restoration and Vegetation Management*

Impacts from habitat restoration and vegetation management would be largely similar to those described for Alternative B. However, they would be applied to

a larger area (PH and GH) and would thus provide more restoration and habitat enhancement for GRSG. Removing livestock grazing on BLM-administered land would eliminate Weed Control Cooperative Range Improvement Agreements with BLM permittees and lessees. Noxious weed control thus would be done by BLM personnel. This could reduce noxious weed control efforts and increase weed patch size and distribution.

### **COT Report Threats—Energy**

#### *Impacts from Fluid Minerals*

Geophysical exploration within PH would be permitted to obtain information for adjacent areas, with timing restrictions to protect GRSG. As described under Alternative B, additional RDFs and conservation measures would be applied as COAs to existing leases. Alternative C would also include seasonal restrictions to activities that could disrupt GRSG and provide additional mitigation measures in both PH and GH. Existing leases could continue to impact GRSG and their habitat; however, no new wells are anticipated to be drilled in LFO in the next decade. Thus, beneficial effects from this alternative on fluid minerals would be negligible, compared to Alternative A.

#### **Impacts from Solid Minerals**

Impacts would be the same as under Alternative B.

### **COT Report Threat—Infrastructure**

#### *Impacts from Lands and Realty*

Under Alternative C, PH and GH would be managed as ROW exclusion areas (345,560 acres; see **Table 4-1**). Establishing ROW exclusion areas would reduce fragmentation on BLM-administered land and would protect GRSG habitat, as described above under *Nature and Type of Effects*. However, given the checkerboard pattern of landownership in the LFO, ROW impacts could be pushed onto adjacent private lands, potentially over a much larger area.

As shown in **Table 4-6** in **Section 4.4** below, more sagebrush habitat is on land not administered by the BLM (863,565 acres) compared to 256,052 acres of BLM-administered land. This suggests that ROW exclusion and avoidance areas may impact more GRSG habitat if potentially pushed onto private land.

Given the absence of land use controls and management, actions proposed under this alternative could increase habitat fragmentation on lands not administered by the BLM. See **Section 4.3** for more information on landownership patterns in ROW avoidance and exclusion areas.

### **COT Report Threats—Grazing and Range Management**

#### *Impacts from Range Management*

Under Alternative C, 343,991 acres would be closed to livestock grazing within PH and GH. This proposed management would eliminate 69,408 AUMs of available forage, leaving 34,398 AUMs of available forage in the planning area outside GRSG habitat (see **Table 4-2**).

Removing permitted grazing uses in habitat areas would reduce the impacts on GRSG, such as loss of herbaceous nesting cover, described under *Nature and Type of Effects*. However, grazing may reduce fuel buildup, so removing it could increase the occurrence of large wildfires, especially given the potential impact on weed control (see above under *Vegetation Management*). Much of the level shrub grassland in Montana that is preferred grazing land is privately owned and increasingly valuable for residential development (MCFWS 2005).

An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for GRSG that inhabit rangeland outside of BLM-administered lands. In the long term, removing grazing permits on federal land could cause ranches to be converted to residential or agricultural use, leading to a loss of GRSG habitat on adjacent private lands. Temperature increases resulting from climate change may also increase crop yields, encouraging lands not previously used for agriculture to be converted for that purpose (NRC 2010).

In addition, no-grazing areas on BLM-administered land would require approximately 3,400 additional miles of fencing to separate these areas from adjacent grazing lands. This would increase the adverse effects of fencing on GRSG, such as raptor predation and potential collision, as well as habitat fragmentation. Construction of 3,400 miles of additional fencing could result in as many as 2,300 additional fence collisions (Stevens et al. 2012), some of which could be fatal for GRSG.

### **COT Report Threat—Recreation**

#### *Impacts from Recreation*

Alternative C includes no specific recreation management related to GRSG or their habitat. Impacts are the same as under Alternative A.

### **Summary of Direct and Indirect Effects on GRSG in the Planning Area Under Alternative C**

There would be no livestock grazing or noxious weed control by permittees under Alternative C. Removing grazing from BLM-administrated lands would increase residual vegetation and increase concealment for GRSG. Most notably,

these increases would be felt in the War Horse and Yellow Water Triangle survey areas, where most BLM-administered lands occur.

In the short term, GRSG populations may increase as a result of removing grazing. Direct effects from ROW exclusion areas within PH would be reduced on BLM-administrated lands. However, this could result in much greater infrastructure impacts on adjacent private lands, especially in the War Horse, eastern Crooked Creek, and Yellow Water Triangle survey areas. Over the long term, absence of grazing would increase fine fuels, making fire suppression within sagebrush habitats less effective. Despite suppression, wildfires would become more prevalent and would increase conversion of Wyoming big sagebrush habitats to grasslands. This would be especially true in the War Horse and Yellow Water Triangle areas.

Grazing would continue on private and state lands in all survey areas and would require BLM-administrated lands be fenced to exclude livestock. The additional fencing would increase GRSG collisions. Smaller ranches that are not viable without BLM grazing permits would be more likely to be converted to agriculture or to be subdivided.

Direct and indirect effects from ROW exclusion areas are similar to Alternative B but would happen over a greater area, encompassing both PH and GH. Direct effects from ROW exclusion areas would be reduced on BLM-administered lands; however, this could result in much greater infrastructure impacts on adjacent private lands, especially in the War Horse, eastern Crooked Creek, and Yellow Water Triangle survey areas. This could prove especially detrimental for GRSG since no RDFs could be stipulated by the BLM on private lands.

The sparse BLM ownership in Winifred could likely have negligible potential indirect impacts on private lands as a result of ROW exclusion areas. Over the long term, ROW exclusion on BLM-administered land would likely decrease the number of large and medium leks in the planning area, especially War Horse and Yellow Water Triangle. The human population in PH in Fergus and Petroleum Counties is sparse, so impacts from the ROW exclusion areas would be limited.

GRSG habitat would increase as a result of vegetation treatments prioritized in PH, especially mechanized treatments targeting conifer encroachment.

The GRSG ACEC established under this alternative would provide no additional protections and could attract additional hunting pressure. Short- and long-term GRSG numbers could decline and no large leks would be expected to persist long-term in the LFO portion of the Yellowstone Watershed Population.

#### 4.2.6 Alternative D

##### **COT Report Threats—Sagebrush Elimination, Agriculture Conversion**

###### *Impacts from Land Tenure Decisions*

No lands in PH would be available for disposal under Alternative D. Impacts from land tenure decisions are the same as under Alternative B.

###### **Impacts from ACECs**

No additional ACECs would be designated under Alternative D, and impacts on GRSG are the same as that described under Alternative A.

##### **COT Report Threat—Fire**

###### *Impacts from Fire and Fuels Management*

Fuels treatment would be designed and implemented with seasonal restrictions and avoidance of winter range, as described under Alternative C. As described under Alternative B, livestock grazing would be considered as a means of fuel reduction and fire suppression would be prioritized in GRSG habitat. Fire suppression in sagebrush areas would protect mature sagebrush and GRSG from the disturbance associated with wildfire. Post-burn restoration programs would help regrowth, compared to Alternatives A, B and C.

##### **COT Report Threats—Vegetation Management (Sagebrush Elimination, Conifer Invasion, Invasive Species)**

###### *Impacts from Habitat Restoration and Vegetation Management*

Impacts from habitat restoration and vegetation management under Alternative D are similar to Alternative B. However, this alternative includes consideration of other threatened, endangered, or sensitive species, in addition to GRSG. This may reduce protection for GRSG habitat in very limited instances.

##### **COT Report Threats—Energy**

###### *Impacts from Fluid Minerals*

Operational constraints would be applied to existing leases, with some exceptions to minimize disturbance associated with mineral extraction, as described under *Nature and Type of Effects*. As under Alternatives B and C, RDFs and conservation measures would be COAs for the permit to drill. No new drilling permits are anticipated in the next decade in LFO, so impacts from fluid minerals are unlikely to affect GRSG populations.

###### *Impacts from Solid Minerals*

Similar to Alternative A, the planning area would be available for coal exploration licensing. However, an environmental review would be conducted to assess impacts and to develop mitigation measures before exploration. Currently there is low coal potential in the planning area; therefore, these

actions are not expected to impact GRSG populations unless future coal resources are discovered.

Locatable minerals development would be managed as described under Alternative A. Prospecting for nonenergy leasable minerals would be permitted after appropriate environmental review. These policies would likely have minimal impact on GRSG, given the low level of mining in the planning area.

#### **COT Report Threat—Infrastructure**

##### *Impacts from Lands and Realty*

PH would be managed as ROW avoidance areas (233,219 acres); no ROW exclusion areas would be established (see **Table 4-1**). The policies described under Alternative D would consider ROW authorizations on a case-by-case basis. They would circumvent impacts of outright ROW exclusion areas where there is mixed public/private landownership of sagebrush habitat. Additionally, these policies would protect GRSG habitat from loss and fragmentation by avoiding ROW construction, while retaining the management flexibility to locate ROWs in less sensitive areas in order to preserve connectivity of PH.

#### **COT Report Threat—Grazing and Range Management**

##### *Impacts from Range Management*

Under Alternative D, there would be no change to the acreage open for grazing or available AUMs described under Alternative A (**Table 4-2**). The policies proposed under Alternative D would be similar to those described under Alternative B. Noxious weed control would be the same as under Alternative B; as a result, impacts on GRSG habitat would be beneficial compared to Alternative A.

#### **COT Report Threat—Recreation**

##### *Impacts from Recreation*

Impacts would be the same as under Alternative B.

#### **Summary of Direct and Indirect Effects on GRSG in the Planning Area Under Alternative D**

Grazing and noxious weed control under Alternative D would be similar to Alternatives A and B. Fire and fuels management would be similar to Alternative B, but rest periods following disturbance would be based on vegetation response and desired conditions, not length of time following disturbance. GRSG habitat would increase as a result of vegetation treatments prioritized where they are most beneficial for GRSG, regardless of PH or GH designation. Treatments targeting species other than GRSG would be allowed, and depending on the habitat targeted, would most likely have no impacts. Additional site-specific NEPA studies would determine impacts for GRSG as well as other listed BLM sensitive species and migratory birds.

Similar to Alternative B, designating routes as part of travel management planning would improve GRSG habitat long term once the plan is implemented. In ROW avoidance areas within PH, the BLM would consider ROW requests on a case-by-case basis. This would influence the most appropriate placement and design for future infrastructure needs, especially in the War Horse, eastern Crooked Creek, and Yellow Water Triangle areas.

Short-term and long-term GRSG numbers would improve and the number of large leks would be maintained or would increase. This alternative provides the best possibility for LFO contributions to population viability for the GRSG Yellowstone Watershed Population, compared to Alternatives A, B and C.

#### **4.2.7 Impacts Summary**

**Table 4-3**, Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative, provides a summary comparison of how each alternative alleviates COT report threats to GRSG listed as “Present and Widespread” and “Present but Localized” for the LFO. The major threats to GRSG habitats in populations occurring across WAFWA MZ I are agriculture conversion, weeds and annual grasses, energy development (primarily oil and gas development), and supporting infrastructure and grazing (USFWS 2013, p. 17). The major threats to GRSG habitats in populations occurring across WAFWA MZ IV are the isolation and small size of the population, agriculture conversion, weeds and annual grasses, and grazing (USFWS 2013, p. 23).

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
<b>Oil and Gas Development*</b>				
Unleased Fluid Minerals				
Areas closed to fluid mineral leasing (acres)	1,949	1,949	1,949	1,949
	Acres closed to fluid mineral leasing (one ACEC, not in PPH or PGH)	Acres closed to fluid mineral leasing (one ACEC, not in PPH or PGH)	Acres closed to fluid mineral leasing (one ACEC, not in PPH or PGH)	Acres closed to fluid mineral leasing (one ACEC, not in PPH or PGH)
Areas open within the planning area to be nominated for fluid mineral leasing (acres)	1,113,841	1,113,841	1,113,841	1,113,841
<b>Summary of Impacts to GRSG from Oil and Gas Development</b>	<p>Alternatives B, C, and D would apply RDFs (<b>Appendix C</b> for Alternatives B and C, and <b>Appendix D</b> for Alternative D) as COAs where appropriate and necessary to drilling permits for currently leased federal minerals. Standard lease stipulations would apply to the existing leases. No new leases would be issued in PPH and PGH or PH and GH under any alternative, based on an existing RMP protest resolution, which requires deferring nominated lease parcels if a special stipulation is required to protect important wildlife values. These conditions and limitations would provide the regulatory mechanisms needed (identified in the COT report [USFWS 2013]) to stop population decline and habitat loss. They would do this by eliminating activities known to negatively impact GRSG and their habitats, and by reducing the threat of habitat loss, degradation and fragmentation.</p>			
<b>Infrastructure Yellowstone Watershed Population*/Anthropogenic</b>				
ROW avoidance areas in PPH and PGH, or PH and GH (acres)	30,193	112,341	0	240,464
	Various ROW avoidance areas designated, none specified to protect PPH and PGH	112,341 acres in GH, no PH ROW avoidance areas because it would be ROW exclusion area	No new ROW avoidance areas because all PH and GH would be ROW exclusion area	233,219 acres of PH and 7,245 acres of GH

<sup>1</sup> Resources/resource uses identified as threats to the LFO populations of GRSG in the COT report are identified with an asterisk\*

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW exclusion areas (acres), in accordance with BLM LUP Handbook, no exceptions permitted	0	233,219	345,560	0
		233,129 acres in PH	All PH and GH	All PH and GH would be a ROW avoidance area
Travel management	345,560 acres limited to existing roads and trails. CTTM planning process for route evaluation and designation would begin within 5 years of the ROD being issued for this RMPA. The BLM would minimize or prevent road and trail development on crucial big game and upland bird habitat areas. BLM regulations (43 CFR, Parts 8341.2 and 8364.1) allow for area, road or trail closures where OHVs are causing, or would cause considerable adverse effects on wildlife and its habitat.			
<b>Summary of Impacts on GRSG from Infrastructure</b>	Overall, Alternative A would have the least protections for GRSG and GRSG habitat from development of infrastructure. Alternative B would have more restrictions on route construction and upgrades, as well as ROWs, than Alternatives A and D, but fewer than Alternative C (some actions under Alternative D are the same as under Alternative B; see <b>Table 2-4</b> ).			
	<p>Alternatives B and C exclude PH from new ROWs. This responds directly to the need identified in the COT report (USFWS 2013) to stop population decline and habitat loss by eliminating activities known to negatively impact GRSG and their habitats. Beneficial impacts are from the reduction in the threat of habitat loss, degradation, and fragmentation on BLM-administered lands. Potential adverse indirect effects in GRSG habitat could increase if these activities were excluded from BLM-administered lands because they would still occur on private land without BLM RDFs or BMP guidance. Ownership patterns in LFO (highly fragmented, with public land comprising approximately 17% of the planning area) could substantially increase the length of infrastructure required to enclose BLM ROW exclusion areas. Alternative D would designate PH and GH as ROW avoidance areas because most PH and GH within the planning area are on private lands. The potential to concentrate infrastructure development where appropriate, and to use RDFs and BMPs, would increase direct beneficial effects from infrastructure on GRSG on BLM-administered lands; however, it could substantially reduce potential indirect adverse effects on a much greater area of adjacent land not administered by the BLM. The benefits of maintaining or improving habitat on most of the PH would exceed the costs on BLM-administered lands and would be more likely to perpetuate a viable GRSG population. Reducing impacts on more of the existing habitat within the planning area is a reason for the ROW avoidance areas rather than ROW exclusion areas in PH and GH under Alternative D. Each action alternative</p>			

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	would require collocating new ROWs with existing ROWs in GH. Alternative D would require this of new ROWs in PH also because new ROWs are not excluded in PH.			
	The action alternatives are in agreement with the following conservation objectives/options identified in the COT report specific to infrastructure:			
	<ol style="list-style-type: none"> <li>1. Avoid developing infrastructure within PACs (objective).</li> <li>2. Avoid constructing these features in GRSG habitat, both within and outside of PACs (option).</li> <li>3. Remove transmission lines and roads that are duplicative or are not functional (option).</li> <li>4. Construct transmission line towers to severely reduce or eliminate nesting and perching by avian predators, most notably ravens, thereby reducing human subsidies to those species (option).</li> </ol>			
<b>Agriculture Conversion (Yellowstone Watershed Population)*</b>				
Areas identified for disposal	Land tenure adjustments in the Judith Resource Area planning area (MZ I) would be subject to disposal/acquisition criteria. Within MZ I, retain important wildlife habitat (one of the three main criteria for land tenure adjustments outlined in the Judith Resource Area Resource Management Plan). Land tenure adjustments in the Headwaters planning area (MZ IV) would be subject to disposal/acquisition criteria.	Retain public ownership of PH. Consider exceptions where there is mixed ownership, and land exchanges would allow for additional or more contiguous federal ownership patterns within PH.	Same as Alternative B, without exceptions for disposal to consolidate ownership that would benefit GRSG (applies to PH and GH).	PH would be retained in public ownership, except when opportunities for land exchange would provide a greater benefit to GRSG habitat.
Areas identified for acquisition	No parcels identified in	Seek to acquire state	Strive to acquire	When offered, PH

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	existing plans for acquisition. If parcels are acquired, land exchanges, sales, or other methods of acquisition may be used.	and private lands with intact subsurface mineral estate by donation, purchase, or exchange in order to best conserve, enhance, or restore GRSG habitat.	important private lands in ACECs. Acquisition would be prioritized over easements.	would be a priority in consideration of land acquisitions (refer to <b>Appendix H</b> ). Consider GRSG for all land tenure actions.
<b>Summary of Impacts on GRSG from Agriculture/Urbanization</b>	<p>Although agriculture and urbanization have been identified as threats within the LFO planning area, including both the Yellowstone Watershed (Conversion) and Belt Mountain (Urbanization) populations, the BLM has no direct management authority over those types of activities. Under Alternatives B and D, the BLM would take advantage of opportunities to consolidate GRSG habitat through land exchange if the action would benefit GRSG. Alternative C would allow for no disposal of PH or GH, regardless of benefits to GRSG. The LFO may have limited indirect abilities to influence these threats through maintaining appropriate authorized uses (grazing, ROWs, recreation, energy development) of BLM-administered lands that allow for the maintenance of habitat objectives. One specific example is to maintain appropriate levels of livestock grazing, which could discourage the conversion of identified GRSG habitat on private land to improved (nonnative) pasture or cropland.</p> <p>Regarding the following conservation objectives/options identified in the COT report specific to infrastructure:</p> <ul style="list-style-type: none"> <li>• Limit urban and exurban development in GRSG habitat and maintain intact native sagebrush plant communities (objective).</li> <li>• Acquire and manage GRSG habitat to maintain intact ecosystems (option).</li> </ul> <p>Alternative D meets the objectives best because of its flexibility. Alternative B meets the objectives but its focus on ROW exclusion areas could lead to greater impacts on non-BLM-administered lands. Alternative C is in agreement with the first objective, but the consequences of its limitations on grazing, including increased fencing and reduced weed control, would not maintain intact GRSG habitat.</p>			

**Table 4-3  
Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
<b>Conifer Encroachment</b>				
See prescribed fire/fuels reduction below.				
<b>Grazing (Yellowstone Watershed and Belt Mountains Populations)*</b>				
Areas closed to livestock grazing (acres)	6,781	6,781	343,991	6,781
			BLM-administered surface lands within PH and GH would be closed to livestock grazing.	
Areas available for livestock grazing (acres)	570,112	570,112	232,902	570,112
	BLM-administered surface lands.	BLM-administered surface lands.	BLM-administered lands outside of PH and GH.	BLM-administered surface lands.
<b>Summary of Impacts on GRSG from Grazing</b>	GRSG habitat considerations within livestock grazing allotments would be similar across Alternatives B, C and D. Range improvement restrictions are the same under Alternatives B and D. Under Alternative C (no grazing), the need for increased fencing on BLM-administered land in order to prevent livestock trespass would result in indirect impacts on GRSG, including increased fragmentation, increased potential for wildfire from fine fuel buildup, increased collision with fences, and increased raptor predation. Additionally, under Alternative C the BLM would lose the current or potential treatment of existing or new infestations of noxious weeds because these weeds are currently treated through agreements with permittees to spray, under the terms and conditions of grazing permits or leases. Under Alternative A, grazing would be managed to achieve the standards of rangeland health, which would address GRSG habitat requirements under most scenarios. However, the potential for project infrastructure up to 0.25 mile of leks under Alternative A could cause fragmentation, raptor perches, and inappropriate fence locations and designs. Alternatives B and D, would also manage grazing to achieve the standards of rangeland health. These alternatives also put specific focus on GRSG habitat requirements in PH to preclude adverse impacts from livestock and project infrastructure. Because Alternative C closes PH and GH to grazing, fine fuels would increase and weed control would be reduced. In addition, potential actions taken on private land to compensate for loss of public grazing might affect GRSG habitat and could be substantial (for example,			

**Table 4-3  
Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	miles of fencing would likely be constructed to hold livestock on private lands).			
<b>Invasive Species (Yellowstone Watershed Population)*</b>				
Weed control	Analysis of the impacts from weeds includes impacts from lands and realty, fluid minerals, wildfire suppression, fuels management and fire rehabilitation. <i>For all alternatives, integrated vegetation management would be used to control, suppress, and eradicate, where possible, noxious and invasive species, in accordance with BLM Handbook H-1740-2.</i>			
Structural range improvements and livestock management tools	Potential for invasive species to become established or to increase following construction would be considered in the project planning process and monitored and treated post-construction.			
RDFs and BMPs for GRSG habitat	No RDFs or BMPs specifically for GRSG under Alternative A. Various RDFs and BMPs under Alternatives B, C and D, described in <b>Appendix C and D</b> , would be applied or suggested at the time an authorized use is granted.			
<b>Summary of Impacts on GRSG from Invasive Species</b>	Due to climate conditions, invasive weeds do not currently threaten the planning area on a large scale. Under all alternatives, the spread of weeds would be managed using integrated vegetation management as resources allow. Under Alternative C, grazing would be eliminated in GRSG habitat, which would remove the lessee agreements on weed control and limit resources for addressing invasive weeds.			
<b>Disease</b>				
Alternatives to reduce impacts from West Nile virus on GRSG are considered under Water Development below. See RDFs and BMPs in <b>Appendix C</b> for Alternatives B and C, and in <b>Appendix D</b> for Alternative D, for a description of RDFs and BMPs to reduce the threat of West Nile virus.				
<b>Coal Mining</b>				
There is no coal potential in the planning area.				
<b>Weather</b>				
There is no resource program in an RMP for addressing this threat to GRSG and its habitat.				
<b>Predation</b>				
See RDFs and BMPs in <b>Appendix C</b> for Alternatives B and C, and in <b>Appendix D</b> for Alternative D, for a description of features designed to reduce the threat of predation.				
<b>Wildfire/Fuels Treatment</b>				
Areas suitable for prescribed fire use and fuels treatments.	Intensive suppression would be applied to areas with high resource values,	In GH, prioritize suppression where wildfires threaten PH and follow RDFs	In PH and GH, follow RDFs ( <b>Appendix C</b> ). In PH and GH, design and implement fuels	In GH, prioritize suppression where wildfires threaten PH and follow RDFs

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	structures, improvements, oil and gas developments, commercial forest values, sagebrush and juniper areas, fire-sensitive woody riparian areas (soil subgroups 6 and 17), and cultural values that require aggressive suppression.	<b>(Appendix C)</b> . In PH, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems.	treatments with an emphasis on protecting existing sagebrush ecosystems.	<b>(Appendix D)</b> . In PH and GH, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems. Sites should not be burned unless a) biological and physical limitations of the site and impact on GRSG are identified and determined to be neutral or beneficial to PH; b) management objectives for the site, including those for wildlife, are clearly defined; c) potential for weed invasion and successional trends are well understood; and d) capability exists to manage the post-burn site properly.
	Controlled burning in conifer and sagebrush types would be done on an individual basis to improve wildlife habitat. Prescribed burning would be administered on an individual basis in grassland, sagebrush, and conifer types to improve wildlife habitat and vegetation production. Burning would be done on a limited basis to improve wildlife and livestock forage in dense pine-juniper stands throughout the Missouri Breaks and to improve vegetation productivity on other upland sites, including sagebrush.	Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in PH. Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and would maintain winter range habitat quality.	Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present. Allow no fuels treatments in known winter range, unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and would maintain winter range habitat quality.	Apply appropriate

**Table 4-3  
Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
				seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in PH. Allow no fuels treatments in known GRSG winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and would maintain winter range habitat quality.
<b>Summary of Impacts on GRSG from Wildfire and Fuels Treatment</b>	Alternative A manages wildfire effectively but Alternatives B, C and D would provide additional protection to sagebrush habitat during fire management. Under all alternatives, anticipated threats from wildfire remain constant (estimated 2,000 acres burned over a decade).			
<b>Water Development</b>				
Identify number and type of range water developments (location of developments not verified at this time).	<ul style="list-style-type: none"> <li>• Nonhabitat - 2,919 dams/pits</li> <li>• PPH or PH - 2,420 dams/pits</li> <li>• PPH or PH - 3,699 other</li> <li>• PGH or GH - 838 dams/pits</li> <li>• PGH or GH - 3,816 other</li> </ul>	RDFs would be applied to new water developments or the reconstruction of existing water developments (pits/reservoirs/dams/holding ponds).		

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Common to all alternatives, the Montana/Dakotas BLM requires the installation of wildlife escape ramps in all water developments on public lands (excluding pits and reservoirs), per Montana/Dakotas IM No. MT-2007-077.				
<b>Solid Mineral Development</b>				
Locatable minerals	Analyze proposed action in Plan of Operations and apply mitigating measures needed to prevent unnecessary or undue degradation. Before the BLM approves a Plan of Operations on existing mining claims in areas withdrawn, it would conduct validity examinations. If the claims did not contain a discovery, within the meaning of the mining laws, the claims would be declared null and void and the Plan of Operations would be denied. The BLM would consider purchasing valid claims where activities threaten the resource values protected by the withdrawal. Analyze proposed action in Plan of Operations and apply mitigating measures needed to prevent	In PH, recommend withdrawal from mineral entry based on risk to the GRSG and its habitat from conflicting locatable mineral potential and development (385,693 acres). Make any existing mining claims within the withdrawal area subject to validity exams or buyout. Require Plan of Operations before any proposed surface-disturbing activities. Consider seasonal restrictions if deemed effective. BMPs ( <b>Appendix C</b> ) needed to prevent unnecessary or undue degradation to GRSG habitat would be applied.	Same as Alternative B, except applies to both PH and GH (639,927 acres). BMPs ( <b>Appendix C</b> ) needed to prevent unnecessary or undue degradation to GRSG habitat would be applied.	Analyze proposed action in Plan of Operations and apply mitigating measures needed to prevent unnecessary or undue degradation. Locatable minerals exploration and development under the mining laws are not authorized under the discretion of the field manager but are reviewed (Notice and Plan of Operations) and approved (Plan of Operations) to prevent unnecessary or undue degradation. Proposed actions under Plan of Operations and Notices would be analyzed on a case-by-case basis in coordinating with MTDEQ. BMPs ( <b>Appendix D</b> )

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	unnecessary or undue degradation.			needed to prevent unnecessary or undue degradation to GRSG habitat would be applied.
Salable minerals	<p>2,437 acres within PGH and 101 acres within PPH are closed to salable minerals disposal.</p> <p>The BLM would issue sales contracts for salable minerals where disposal is deemed to be in the public interest, while providing for reclamation of mined lands and preventing unnecessary or undue impact on nonmineral resources. Salable minerals permits are considered on a case-by-case basis and are issued at the discretion of the area manager (639,927 acres open for sale of minerals).</p> <p>The planning area would be available for coal exploration licenses. Surface occupancy within</p>	<p>Close PH to salable minerals disposal (385,693 acres). In PH, restore salable mineral pits no longer in use to meet GRSG habitat conservation objectives. 100 acres of BLM-administered lands within PH are currently salable mineral disposal sites.</p>	<p>Close PH and GH to salable minerals disposal (639,927 acres). In PH and GH, restore salable mineral pits no longer in use to meet GRSG habitat conservation objectives. 300 acres of BLM-administered lands within PH and GH are currently salable mineral disposal sites.</p>	<p>2,437 acres within GH and 101 acres within PH are closed to salable minerals disposal. In PH, the BLM would issue permits for salable minerals where disposal is deemed to be in the public interest, while providing for reclamation of mined lands and preventing unnecessary or undue degradation (<b>Appendix D</b>). Salable minerals material permits are considered on a case-by-case basis and are issued at the discretion of the field manager (639,927 acres open for sale of minerals).</p>

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	MZ IV generally would be prohibited within public road corridors, ROWs, floodplains, and key wildlife areas.			Surface occupancy within MZ IV, generally would be prohibited within public road corridors, ROWs, floodplains, and key wildlife areas. In PH, restore salable mineral pits no longer in use to meet GRSG habitat conservation objectives.
<b>Summary of Impacts on GRSG from Solid Mineral Development</b>	Alternatives B and C would be more protective of GRSG and habitat than Alternatives A and D, although Alternative D, in the case of reclamation of salable mineral pits, requires the same action as Alternative B. Effective mitigation for existing mining claims and salable mineral sites is similar across Alternatives B, C and D. Alternative D provides a greater number of BMPs to be considered as necessary and appropriate to mitigate impacts.			
<b>Climate Change</b>				
There is no specific resource program in this RMPA for addressing this threat to GRSG and its habitat. However, actions under several resources listed below do address climate change and drought impacts on GRSG habitat. Furthermore, BLM grazing regulations 43 CFR, Part 4110.3-2, Decreasing Permitted Use, states: (a) Permitted use may be suspended in whole or in part on a temporary basis due to drought, fire, or other natural causes, or to facilitate installation, maintenance, or modification of range improvements.				
Implementing management actions after land health evaluations	Efforts to manage public rangeland under drought conditions would be directed first to allotments with resource concerns such as "I" category allotments. Specific allotments in the "M" and "C" categories could also be considered	During droughts, prioritize evaluating effects of the drought in PH relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought, ensure that post-drought	During droughts, prioritize evaluating effects of the drought in PH and GH relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought, ensure that post-drought	During droughts, prioritize evaluating effects of the drought in PH, relative to their needs for food and cover. Drought management would continue to be in accordance with the Montana/Dakotas

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

<b>Resource/Resource Use<sup>1</sup></b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	high priority when resource values or conditions so require.	management allows for vegetation recovery that meets GRSG needs in PH.	management allows for vegetation recovery that meets GRSG needs in PH.	drought policy ( <b>Appendix I</b> ). Since there is a lag in vegetation recovery following drought, post-drought management would be implemented to allow for vegetation recovery that meets GRSG needs in PH.
ES&R and habitat restoration and vegetation management		In PH, consider potential changes in climate when proposing restoration seeding of native plants. Consider collecting from the warmer component of the species' current range when selecting native seed.	In PH and GH, consider potential changes in climate when proposing restoration seeding of native plants. Consider collecting from the warmer component of the species' current range when selecting native seed.	In PH, consider potential changes in climate when proposing restoration seeding of native plants. Consider collecting from the warmer component of the species' current range when selecting native seed. Develop an appropriate seed mix for the location, based on current climatic data as well as soils/ecological site descriptions.

**Table 4-3**  
**Comparison of Alleviated Threats to GRSG in the Lewistown Field Office by Alternative**

Resource/Resource Use <sup>1</sup>	Alternative A	Alternative B	Alternative C	Alternative D
<b>Contaminants</b>				
<p>There are no management actions in this RMPA for addressing this threat to GRSG and its habitat. RDFs and BMPs, when applicable and appropriate, would be applied to use authorizations (<b>Appendix C</b> for actions under Alternatives B and C, and <b>Appendix D</b> for actions under Alternative D) to prevent the potential threat of contaminants.</p>				

### 4.3 LANDS AND REALTY

#### 4.3.1 Methods and Assumptions

##### *Indicators*

**Table 4-4**, Comparison of Lands and Realty Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on lands and realty under each alternative.

**Table 4-4**  
**Comparison of Lands and Realty Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Acres of surface ownership in the planning area	No change	No change	No change	No change
Acres of land tenure adjustments (i.e., lands identified for disposal, withdrawal, or acquisition)	N/A	385,693 for mineral withdrawal	639,927 for mineral withdrawal	0
Number, acres/miles, and types of surface-disturbing ROWs and leases, including communication sites	909 acres	Short-term increase, long-term decrease if buried or removed	Short-term increase, long-term decrease if buried or removed	Short-term increase, long-term decrease if buried or removed

##### *Assumptions*

The analysis includes the following assumptions:

- Existing ROWs, designated utility corridors, and communication sites would be managed to protect valid existing rights.
- On renewal, assignment, or amendment of existing ROWs, additional stipulations could be included in the land use authorization.
- ROW holders may continue their authorized use as long as they are in compliance with the terms and conditions of their grant.
- The BLM would continue to process land use authorizations and land tenure adjustments as workforce and workload allow.
- The demand for all types of ROWs (including communication sites, utilities, and renewable energy projects) would gradually increase over time.
- Maintaining and upgrading utilities, communication sites, and other ROWs is preferred before the construction of new facilities in the decision area, but only if the upgrading can be accommodated in the existing ROW.

- Demand for small distribution facilities to extend and upgrade services, such as communication sites and utilities, would increase as rural development occurs on the dispersed private parcels within the planning area.
- Demand for both regional and interstate transmission lines would increase as population and urban areas grow.
- Demand for new ROWs is expected to increase as demand for new communication technology, such as fiber optic cable, grows.
- Retention areas include all decision area lands (the BLM-administered lands within the planning area), with the exception of lands identified, or under consideration for disposal.
- In accordance with the Omnibus Act, the BLM would continue to manage all previously withdrawn BLM-administered lands as withdrawn from entry, appropriation, or disposal under the public land laws. Withdrawals would be reviewed, as needed, and recommended for extensions, modifications, revocations, or terminations. All existing withdrawals initiated by other agencies, such as the US Bureau of Reclamation or the Department of Energy, would be continued unless the initiating agency or BLM requests that the withdrawal be revoked.

#### **4.3.2 Nature and Type of Effects**

Resources and resource uses affect the lands and realty program by prescribing stipulations and mitigation to protect resources within ROW exclusion and avoidance areas. A ROW exclusion area is one that is not available for new ROW location under any conditions. A ROW avoidance area may be available for ROW location but may require special stipulations. ROW applications could be submitted in ROW avoidance areas; however, a project proposed in these areas may be subject to additional requirements, such as resource surveys and reports, construction and reclamation engineering, long-term monitoring, special design features, special siting requirements, timing limitations, rerouting, and off-site mitigation. Such requirements could restrict project location or they could delay availability of energy supply (by delaying or restricting pipelines, transmission lines or renewable energy projects) or they could delay or restrict communications service availability. As a result of special surveys and reports, alternative routes may need to be identified and selected to protect sensitive resources, such as GRS habitat. Designating ROW exclusion and avoidance areas and applying special stipulations would result in increased application processing time and costs due to the potential need to relocate facilities or due to greater design, mitigation, and siting requirements.

Collocating transmission and mineral development infrastructure in existing ROWs, and existing disturbed areas, reduces land use conflicts and additional land disturbance. Collocation policies also clarify the preferred locations for

utilities and simplify processing on BLM-administered lands. However, collocating can limit options for mineral development and selection of more-preferable locations for ROWs.

Travel management actions can involve closing areas or specific routes to motorized or mechanized travel, thereby creating areas that are impractical for some types of land uses, such as transmission lines or communication sites.

Land tenure adjustments are intended to maintain or improve the efficiency of BLM management, including management of GRSG habitat. Land disposal can result in a more contiguous decision area, thus increasing BLM-administered lands management efficiency. However, while consolidation may be beneficial for certain resources and uses, it may not necessarily reduce effects on GRSG habitat.

The following resources or resource uses would have negligible or no impact on land use authorizations and land tenure and are, therefore, not discussed in detail: range management, fluid and solid minerals, mineral split estate, fire and fuels management, and habitat restoration/vegetation management.

### **4.3.3 Impacts Common to All Alternatives**

#### ***Impacts from Lands and Realty***

Under all alternatives, the BLM would continue to process a pending land exchange within PH. The exchange would transfer 240-acres of private land to BLM ownership in exchange for disposing 240 acres of BLM-administered land to private ownership. The lands to be transferred into public ownership contain a lek site. The exchange would benefit GRSG under all alternatives; however, each alternative would result in greater or lesser levels of protection depending on the specific management actions proposed.

#### ***Impacts from Recreation***

Within the decision area, there is one SRMA and 11 ERMAs. BLM management goals and objectives are to preserve a desired setting and recreation experience for users within these areas. Land uses in the SRMAs and ERMAs should not conflict with recreation uses. In all alternatives, the BLM would continue to evaluate land use authorizations on a case-by-case basis in the special recreation areas so as to avoid conflicting uses.

### **4.3.4 Alternative A**

#### ***Impacts from Travel and Transportation Management***

Under Alternative A, travel would continue to be allowed on 595 miles of existing roads and trails in the decision area. Existing transportation routes would continue to provide motorized access to ROW infrastructure and communication sites for construction and maintenance. Planning area habitat would remain closed to cross-country vehicle use.

***Impacts from Lands and Realty***

Under Alternative A, 215 total miles of existing ROWs in the decision area, including 162 miles in PPH and 53 miles in PGH, would continue to provide opportunities for collocation of new infrastructure. A total of 2,601 acres associated with the Acid Shale-Pine Forest ACEC and Judith River Canyon would continue to be managed as ROW avoidance areas. All lands within the decision area would continue to be open for ROW development (subject to NEPA analysis).

BLM-administered lands would continue to be available for ROWs on a case-by-case basis, in accordance with Title V of FLPMA and 43 CFR, Part 2800. All ROW applications would be reviewed using the criteria of following existing corridors wherever practical and avoiding the proliferation of separate ROWs.

Wind facilities would be authorized through the ROW authorization process. See **Section 4.20**, Renewable Energy, for impacts on wind energy development.

Under Alternative A, the BLM would continue to manage 593,995 surface acres. There would continue to be six withdrawals in the decision area amounting to 2,538 acres (101 acres in PPH and 2,437 acres in PGH). Land tenure and adjustments would be subject to the disposal and acquisition criteria in the existing RMPs.

***Impacts from ACECs***

Under Alternative A, the Acid Shale-Pine Forest ACEC would continue to be a ROW avoidance area, continuing to affect ROW authorization application processing times and design standards for proposed ROWs within the 2,463-acre ACEC boundary.

**4.3.5 Alternative B*****Impacts from Travel and Transportation Management***

BLM would evaluate the need for permanent or seasonal road closures under Alternative B. Should the BLM determine during a future site-specific evaluation that there is a need to close certain routes, those closures could affect the convenience of access for ROW holders to existing ROW infrastructure, as described above under *Nature and Type of Effects*.

Under Alternative B, the BLM would only allow new roads where access to valid existing rights is necessary and does not currently exist. This would limit new ROW authorizations and new road construction as compared to Alternative A. Limitations on new road construction could make certain areas impractical for new ROW authorizations, particularly in areas not readily accessible via existing roadways.

**Impacts from Lands and Realty**

Under Alternative B, 233,219 acres of the decision area associated with PH (39 percent of BLM-administered land within the planning area) would be designated as ROW exclusion area for new ROW authorizations. GH in the decision area (112,341 acres) would be designated ROW avoidance area. However, 843 total acres of unitized lease areas (301 acres of PH and 542 acres of GH) would be exempt from ROW limitations related to oil and gas development.

As noted above in *Nature and Types of Effects*, limitations on new ROWs and aboveground linear features, such as transmission lines and pipelines, could restrict the availability of energy or service availability and reliability for communication systems. ROW exclusion and avoidance areas could extend processing time for renewals of existing ROW authorizations. The designations could make siting new linear or block ROWs more difficult than under Alternative A.

Additionally, under Alternative B, the BLM would take advantage of opportunities to remove, bury, or modify 42 miles of existing power lines within PH. As noted above in *Nature and Types of Effects*, limitations on new ROWs and above-ground linear features, such as transmission lines and pipelines, could restrict the availability of energy or service availability and reliability for communication systems.

The BLM would retain public ownership in PH except where land exchanges would result in more contiguous federal ownership patterns or where disposal accompanied by a habitat mitigation agreement or conservation easement would result in more effective management of GRSG habitat. If the BLM were to proceed with land tenure adjustments, those actions would enhance BLM management of GRSG habitat but could affect existing authorizations and leases, as described in *Nature and Type of Effects*.

**Impacts from ACECs**

Under Alternative B, the Acid Shale-Pine Forest would become a ROW exclusion area. Impacts on the lands and realty program from limitations on new ROW authorizations would be the same within and outside the ACEC and consistent with the *Nature and Types of Effects*.

**4.3.6 Alternative C****Impacts from Travel and Transportation Management**

Impacts on the lands and realty program under Alternative C would be the same as those described above under Alternative B, with the exception that Alternative C would prohibit new road construction within four miles of active leks. Because of the density of active lek sites, new road construction on BLM-administered land in the planning area would be limited to 21 percent of the decision area (13,340 acres in PH and 57,785 acres in GH), which is a reduction in areas available for new road construction and ROWs as compared to

Alternative A. This reduction would increase those effects described in *Nature and Type of Effects*, including delays in application processing time and costs, increase siting limitations, and delay delivery of energy supplies as compared to Alternative A.

#### ***Impacts from Lands and Realty***

Under Alternative C, PH and GH (345,560 acres) would be designated as ROW exclusion area for new ROW authorizations. However, 843 acres would be located inside a unitized area. Lands within the unitized area would be exempt from the ROW exclusion area provisions related to oil and gas development. Impacts on ROW authorizations are the same as under Alternative B and are consistent with effects described in *Nature and Types of Effects*.

The BLM would retain public ownership in PH with no exceptions and seek to acquire private lands when offered in ACECs. Impacts from land withdrawals would be the same as Alternative B.

#### ***Impacts from ACECs***

Under Alternative C, the BLM would designate 96,246 acres of GRSG habitat as a new ACEC with management tailored to protect the GRSG habitat. BLM management of lands and realty would be the same outside the ACEC boundary as it would be inside. PH and GH would be managed as a ROW exclusion area. Designation of ROW exclusion and avoidance areas could affect the number and type of ROW authorizations depending on the location and nature of any proposed ROW.

### **4.3.7 Alternative D**

#### ***Impacts from Travel and Transportation Management***

Under Alternative D, the BLM would complete a travel and transportation management plan, designating certain roads as open, closed or limited to motorized travel. The BLM would also consider permanently closing certain user-created roads and trails where off-road vehicle use would cause adverse effects on habitat. This would likely increase the effects on lands and realty actions as compared to Alternative A.

#### ***Impacts from Lands and Realty***

Under Alternative D, PH (233,219 acres) would be managed as ROW avoidance area for new ROW authorizations. PH and GH would be designated as wind energy ROW avoidance (345,560 acres). New ROW development would continue to be allowed in GH, within existing ROWs, and within the 843 acres of unitized lease areas, including 301 acres of unitized acres in PH. The designation of PH as ROW avoidance could limit the placement of new above ground infrastructure, resulting in an increase of effects on the lands and realty actions as compared to Alternative A. The extent of the effects would be based on the location and type of any proposed new ROW.

Impacts from land tenure adjustments would be the same as Alternative B.

#### **Impacts from ACECs**

Impacts would be the same as those described above under Alternatives A and B.

## **4.4 VEGETATION (INCLUDING NOXIOUS WEEDS; RIPARIAN AND WETLANDS)**

### **4.4.1 Methods and Assumptions**

Impacts were determined by assessing which actions, if any, would change the upland vegetation, riparian and wetland vegetation, and weed indicators described below. Some impacts are direct, while others are indirect and affect vegetation through a change in another resource. Direct impacts on vegetation include disrupting, damaging, or removing vegetation, thereby reducing area, amount, or condition of native vegetation. Included among these are actions that reduce total numbers of plant species and actions that reduce or cause the loss of diversity, vigor, or structure of vegetation, or that degrade its function as habitat for GRSG or other wildlife.

Indirect impacts are those that may occur later in time, such as decreased plant vigor or health from dust or reduced water quality. Other indirect impacts include loss of habitat suitable for vegetation colonization due to surface disturbance; introduction of weeds that compete with desirable, native vegetation; conditions that enhance the spread of weeds; and general loss of potential habitat due to surface occupancy or soil compaction.

#### **Indicators**

**Table 4-5**, Comparison of Vegetation Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on vegetation under each alternative.

**Table 4-5  
Comparison of Vegetation Indicators by Alternative**

<b>Indicator</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Acres meeting Rangeland Health standards	Possible increase	Possible increase	Stable/possible decrease	Possible increase
Acres of sagebrush (PH/GH <sup>1</sup> )	345,560	Possible increase	Increase	Possible increase
Extent of fragmentation	Increasing	Stable or decreasing	Decreasing	Stable or decreasing
Percentage of riparian areas in PFC	Stable	Increase	Increase	Increase
Acres of riparian/wetland vegetation	6,937	Stable or increasing	Stable or increasing	Stable or increasing
Change in spread of noxious weeds	Stable	Stable	Stable or increasing	Stable

<sup>1</sup>PPH and PGH for Alternative A (no PH or GH is presently designated).

### **Assumptions**

The analysis includes the following assumptions:

- All plant communities would be managed toward achieving a mix of species composition, cover, and age classes across the landscape, except in site-specific situations where introduced grass plantings (crested wheatgrass) are used to defer livestock use of native pasture.
- The degree of impact attributed to any one disturbance or series of disturbances would be influenced by several factors, including location in GRSG habitat; the type, time, and degree of disturbance; existing vegetation; precipitation; and mitigating actions applied to the disturbance.
- Noxious and invasive weeds would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the planning area, recreational activities, wildland fire, wildlife and livestock grazing and movements, and surface-disturbing activities.
- Activities that would disturb soils could cause erosion, loss of topsoil, and soil compaction, which could affect the ability of vegetation to regenerate. Further, surface-disturbing activities could increase dust, which could cover existing vegetation and impair plant photosynthesis and respiration. Resulting impacts could include lowered plant vigor and growth rate, altered or disrupted pollination, and increased susceptibility to disease.
- Ecological health and ecosystem functioning depend on a number of factors, including vegetative cover, species diversity, nutrient cycling and availability, water infiltration and availability, and percent cover of weeds.
- Climatic fluctuation would continue to influence the health and productivity of plant communities on an annual basis.
- Short-term effects would occur over a timeframe of two years or less and long-term effects would occur beyond two years.
- Removal of livestock grazing from BLM-administered land would eliminate the opportunity to initiate weed control cooperative range improvement agreements for noxious weed control on affected lands.

#### **4.4.2 Nature and Type of Effects**

GRSG rely on sagebrush ecosystems for all aspects of their life cycle. Typically, a range of sagebrush community composition within the landscape (including variations in sub-species composition, co-dominant vegetation, shrub cover, herbaceous cover, stand age) are needed to meet seasonal, and inter-seasonal, requirements for food, cover, nesting, and wintering habitats. The landscape

required for GRSG may range from up to 40 square miles. Thus, conserving and managing GRSG is as much about the ecology, management and conservation of large, intact sagebrush ecosystems as it is about the dynamics and behaviors of the populations themselves (Manier et al. 2013).

Historically, sagebrush-dominated vegetation was one of the most widespread habitats in the country, but its expanse has been fragmented, lost, or altered by invasive plants and anthropogenic disturbance (NTT 2011, p.4). Protection of GRSG habitat would involve restrictions and limitations on activities that contribute to the spread of invasive species, fire, and other surface disturbance, and management of vegetation to promote healthy sagebrush and understory vegetation to support GRSG.

#### **Vegetation Management and Habitat Protection**

In addition to landscapes with large, intact patches of sagebrush (i.e., those with limited habitat fragmentation), GRSG require high-quality habitat conditions. These are a diversity of herbaceous species, vegetative and reproductive health of native grasses, and an abundance of sagebrush, making management for high condition important in seasonally important habitats (Connelly et al. 2004). Given the limited distribution of suitable sagebrush habitats and the cost of habitat restoration, management plans that protect intact sagebrush acreage and restore impacted areas strategically to improve habitat connectivity have the best chance of increasing the amount and quality of sagebrush cover (Manier et al. 2013). Sagebrush-promoting vegetation treatments would protect native vegetation and overall ecosystem productivity, while reducing the distribution of invasive weeds and woody conifer species.

Invasive plants can alter plant community structure and composition, productivity, nutrient cycling, and hydrology, and may competitively exclude native plant populations. Invasive plant spread may result in habitat loss and fragmentation, and may also increase the risk of wildfire. The spread of invasive plants such as cheatgrass has increased the frequency and intensity of fires in some areas (Balch et al. 2012), though the LFO currently has cheatgrass only in isolated patches. An assortment of nonnative annuals and perennials and native conifers are currently invading sagebrush ecosystems, notably juniper species.

Expansion of conifer woodlands present a threat to GRSG because they do not provide suitable habitat, and mature trees displace shrubs, grasses and forbs through direct competition for resources; conifer expansion is also associated with increased bare ground and erosion potential. Mature trees may offer perch sites for raptors and increase predation threats (Petersen et al. 2009; Bradley 2010). Current treatments and active vegetation management typically focus on vegetation composition and structure for fuels management, habitat management and/or productivity manipulation for improving the habitat and forage conditions for ungulates and other grazers. Vegetation management techniques increase productivity by stabilizing soil surfaces or by removing

invasive plants (Knick et al. 2011). Vegetation treatments would cause short-term disturbance to vegetation from removal but would result in long-term improvements to habitat quality.

Treatments designed to prevent encroachment of shrubs, non-native species or woody vegetation would alter the condition of native vegetation communities by changing the density, composition, and frequency of species within plant communities. The intent of these management programs is to improve rangeland condition and enhance sagebrush ecosystems.

Vegetation manipulations in the riparian zone, such as weed treatments, native plantings, and erosion control in the channel, improve the condition of the riparian vegetation community, individual riparian species, and hydrologic functionality to attain PFC. Habitat connectivity for GRSG could be increased through vegetation manipulation designed to restore vegetation, or transition of an area to better match the surrounding vegetation.

Direct protection of sagebrush habitat to support GRSG would limit or modify uses in this habitat type. Use restrictions would reduce damage to native vegetation communities and individual native plant species in areas that are important for regional vegetation diversity and quality. Likewise, use restrictions would minimize loss of connectivity and would be more likely to retain existing age class distribution within these specific areas. Use restrictions could also minimize the spread of invasive species by limiting human activities that cause soil disturbance or seed introductions.

#### **Wildland Fire**

While wildfires likely played an important role historically in creating a mosaic of herbaceous-dominated areas (recently disturbed), and mature sagebrush (less-frequently disturbed), current land-use patterns have restricted the system's ability to support natural wildfire regimes. Slow rates of re-growth and recovery of vegetation after disturbances (driven by low water availability and other constraints) have contributed to the accumulating displacement and degradation of the sagebrush ecosystem (Beck et al. 2009). Thus, preservation of sagebrush against wildfire and limiting use of prescribed burning is important to preserving GRSG habitat.

Big sagebrush does not re-sprout after a fire, but is replenished by wind-dispersed seed from adjacent unburned stands or seeds in the soil. Depending on the species and the size of a burn, sagebrush can reestablish within five years of a burn, but a return to a full pre-burn community cover can take 13 to 100 years (Connelly et al. 2004). Fire suppression may be used to maintain habitat for GRSG (NTT 2011). When management reduces wildland fire frequency by controlling natural ignitions, the indirect impact is that vegetation ages across the landscape and early successional vegetation communities are diminished. Fire suppression may preserve condition of some vegetation communities, as well as habitat connectivity. This is particularly important in areas where fire

frequency has increased as a result of weed invasion, or where landscapes are highly fragmented. Fire suppression can also lead to increased fuel loads, which can lead to more damaging or larger-scale fires in the long term. Fire also increases opportunities for invasive species, such as cheatgrass, to expand (Balch et al. 2012), so fire suppression can indirectly limit this expansion.

Controlled burning may be prescribed to treat fuel buildup and can assist in the recovery of sagebrush habitat in some vegetation types. Re-seeding with native plants and long-term monitoring to ensure the production of GRSG cover and forage plants, would assist vegetation recovery (NTT 2011).

#### ***Lands and Realty***

Construction of utility ROWs often involves vegetation removal, which would disturb native vegetation communities and individual native plant species, alter age class distribution, reduce connectivity, and encourage the spread of invasive species. ROWs may extend for many miles, fragmenting habitat and increasing the potential for weeds to be spread (NTT 2011). ROW corridors would be managed to concentrate placement of large linear facilities and other ROW development in less-sensitive areas and to minimize the loss of connectivity and total acreage of vegetation that would be disturbed.

The holder of a ROW is responsible for weed control on disturbed areas within the limits of the ROW. The holder is responsible for invasive weed control for the life of the ROW plus three years. The holder is responsible for consultation with the authorized officer or local authorities for acceptable weed control methods.

ROW exclusion areas would prohibit all development of ROWs in PH, with the exceptions provided, while ROW avoidance areas would consider on a case-by-case basis whether an ROW should be allowed. This flexibility may be advantageous where federal and private land-ownership areas are mixed, while ROW exclusion areas could result in more widespread development on private lands.

#### ***Mineral Resources***

Many sagebrush ecosystems overlay major oil and gas reserves, which has created a long history of mining and exploration, particularly on eastern portions of the range, which include the planning area. Energy development requires construction of roads, well pads, wells and other infrastructure, and associated noise, traffic and lights, that alter, degrade and/or entirely displace native ecosystems and disturb wildlife (Manier et al. 2013). Surface disturbance associated with mineral development often removes vegetation, reduces the condition of native vegetation communities and the connectivity of habitat, and encourages the spread of invasive species (NTT 2011).

Despite lease nomination deferrals of public lands to oil and gas leasing within PH and GH, many valid leases remain across GRSG ranges, including the LFO

(Manier et al. 2013). If mineral development is shifted away from sagebrush habitat to other areas to protect GRSG, impacts on vegetation in GRSG habitat would be reduced.

#### **Recreation**

Recreational use of GRSG habitat can be benign, but excessive use may cause degradation of sagebrush vegetation. Potential impacts from recreational use include trampling, soil compaction, erosion, spread of invasive plants, and generation of fugitive dust (NTT 2011; Bradley 2010). Recreational use can also increase the potential for wildfire caused by invasive plant spread or human error (Knick et al. 2011). Most impacts occur in easily accessible areas from motorized use, especially OHV use. Restrictions on recreational use of GRSG habitat would limit damage to the vegetation communities that comprise this habitat, by directly reducing disturbance to vegetation from trampling, motorized vehicles, dust, and spread of invasive species. Such restrictions could involve seasonal area closures or limitations on the number of users or types of uses permitted.

#### **Travel and Transportation**

Road construction divides and fragments GRSG habitat, and causes erosion and nutrient leaching. The use of roads and trails creates soil compaction, and allows the spread of human disturbance, including wildfire and invasive plant species (Knick and Connelly 2011; Wisdom et al. 2011). Invasive species can out-compete sagebrush and other vegetation essential for GRSG survival. Invasive species also increase wildfire frequencies, further contributing to loss of habitat (Balch et al. 2012).

For protection of GRSG, some roads may be seasonally or permanently closed, traffic may be restricted to designated routes, and new route construction avoided in PH to the maximum extent possible (NTT 2011).

#### **Livestock Grazing**

Livestock grazing is the most widespread land use across the sagebrush biome (Connelly et al. 2004). Livestock grazing can affect soils, vegetation health, species composition, water, and nutrient availability by consuming vegetation, redistributing nutrients and seeds, trampling soils and vegetation, and disrupting microbial systems (Connelly et al. 2004; NTT 2011). Livestock grazing is a “diffuse” form of biotic disturbance that exerts repeated pressure over many years on a system; thus, effects of grazing are not likely to be detected as disruptions, but as differences in the processes and functioning of the sagebrush system. Grazing effects are not distributed evenly because historic practices, management plans and agreements, and animal behavior all lead to differential use of the range (Knick 2011). Livestock often use riparian and wetland areas for water and shade, and may trample riparian vegetation, which could reduce riparian community condition and contribute to erosion.

Livestock grazing may have both beneficial and detrimental aspects, depending on site-specific management (Connelly et al. 2004). At unsustainable levels, grazing can lead to loss of vegetative cover, decreased plant litter, increased soil erosion, and reduced habitat quality for wildlife, including GRSG (Knick 2011; Connelly et al. 2004).

Properly managed grazing can be used as a tool to reduce fuel load, to protect intact sagebrush habitat, and to increase habitat extent and continuity (Adams et al. 2004). Grazing can also have beneficial effects on vegetation, by reducing litter removing annual grasses, facilitating growth of native species and increasing vegetation community diversity. Land health evaluations are used to assess rangeland condition and help to identify where changing in grazing management would be beneficial. In areas meeting Rangeland Health Standards, grazing practices co-exist with healthy vegetation communities providing wildlife habitat.

Grazing systems that provide for closer management of allotments in GRSG habitat and aim to protect sagebrush and riparian ecosystems would protect vegetation, by allowing more plant growth and reducing trampling and introduction of exotic species. Reducing or removing grazing in habitat areas would also reduce these effects but could have unintended consequences of increasing fuel building or degrading vegetation quality over the long term.

#### **4.4.3 Impacts Common to All Alternatives**

##### ***Impacts from Solid Minerals***

There are no known coal resources located in the planning area; therefore, associated management actions related to coal would not impact vegetation under any of the alternatives.

#### **4.4.4 Alternative A**

##### ***Impacts from Travel and Transportation Management***

Under Alternative A, BLM-administered lands would continue to permit limited yearlong use for motorized wheeled vehicles, restricted to existing roads and trails. Continuation of this policy would allow for invasive plants introduction, wildfire, soil compaction, fragmentation, and other effects discussed under *Nature and Type of Effects*.

##### ***Impacts from Recreation***

Alternative A includes no specific recreation management related to GRSG or their habitat and thus current impacts from recreation on vegetation as described under *Nature and Type of Effects* would continue. Potential impacts include vegetation trampling, soil compaction, erosion, invasive plant spread, and fugitive dust generation.

***Impacts from Lands and Realty***

Under Alternative A, ROWs would be considered on a case-by-case basis outside of ROW exclusion and avoidance areas, and ROWs would be collocated when possible, which would reduce surface disturbance and vegetation removal. There are no ROW exclusion areas within the planning area; however, there are two ROW avoidance areas, Acid Shale Pine Forest ACEC and Judith River Canyon. Vegetation disturbance and removal would be reduced in avoidance areas, as described under *Nature and Type of Effects*. **Table 4-6**, ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres), shows ReGAP habitat types within ROW avoidance and exclusion areas, including lands not administered by the BLM. The table shows that more sagebrush habitat is located on land not administered by the BLM (863,565 acres compared to 256,052 acres), suggesting that development restrictions on BLM-administered land could push ROW construction onto private lands and may not result in any benefit to sagebrush habitat.

Land tenure adjustments would be subject to current disposal and acquisition criteria, which include retaining important wildlife habitat and nesting habitat for game animals. Retention would reduce the likelihood of habitat conversion to agriculture, urbanization, or other uses that would remove vegetation in these areas. Currently, there are no areas identified for withdrawal in the planning area.

**Table 4-6**  
**ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by**  
**Alternative (Acres)**

Habitat Type	Non-BLM <sup>1</sup>		Alternative A		Alternative B			Alternative C		Alternative D	
	GH	PH	Avoidance <sup>2</sup>	Neither <sup>3</sup>	Avoidance <sup>4</sup>	Exclusion <sup>5</sup>	Neither <sup>3</sup>	Exclusion <sup>6</sup>	Neither <sup>3</sup>	Avoidance <sup>7</sup>	Neither <sup>3</sup>
Cultivated cropland	90,147	70,077	8	3,916	1,623	2,301	0	3,924	0	2,301	1,623
Developed, Low Intensity	1,673	1,858	0	143	29	114	0	144	0	114	29
Developed, Medium Intensity	18	3	0	2	2	0	0	2	0	0	2
Developed, Open Space	9,318	2,906	0	242	69	173	0	242	0	173	69
InterMountain Basins Big Sagebrush Steppe	286,096	523,109	2,942	211,354	44,698	169,598	0	214,297	0	169,598	44,698
InterMountain Basins Greasewood Flat	7,336	6,513	253	3,839	1,747	2,345	0	4,093	0	2,345	1,747
InterMountain Basins Montane Sagebrush Steppe	54,272	0	0	135	135	0	0	135	0	0	135
Introduced Upland Vegetation Perennial Grassland and Forbland	79,759	119,309	6	6,558	1,757	4,807	0	6,564	0	4,807	1,757
Middle Rocky Mountain Montane Douglas fir Forest and Woodland	8,473	0	0	31	31	0	0	31	0	0	31
North American Arid West Emergent Marsh	257	1,155	0	204	4	200	0	204	0	200	4
Northern Rocky Mountain DryMesic Montane Mixed Conifer Forest	-0	0	0	26	26	0	0	26	0	0	26

**Table 4-6**  
**ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres)**

Habitat Type	Non-BLM <sup>1</sup>		Alternative A		Alternative B			Alternative C		Alternative D	
	GH	PH	Avoidance <sup>2</sup>	Neither <sup>3</sup>	Avoidance <sup>4</sup>	Exclusion <sup>5</sup>	Neither <sup>3</sup>	Exclusion <sup>6</sup>	Neither <sup>3</sup>	Avoidance <sup>7</sup>	Neither <sup>3</sup>
Northern Rocky Mountain Foothill Conifer Wooded Steppe	21,326	10,619	1,324	11,514	9,423	3,415	0	12,839	0	3,415	9,423
Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland	41,098	0	0	219	120	99	0	219	0	99	120
Northern Rocky Mountain Montane Foothill Deciduous Shrubland	818	0	0	2	2	0	0	2	0	0	2
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	1,908	13,885	0	2	2	0	0	2	0	0	2
Northwestern Great Plains Black Hills Ponderosa Pine Woodland and Savanna	32,673	118	2,482	18,429	14,360	6,551	0	20,912	0	6,551	14,360
Northwestern Great Plains Floodplain	2,318	76	34	177	195	16	0	211	0	16	195
Northwestern Great Plains Mixed-grass Prairie	105,251	150,819	298	38,918	8,377	30,839	0	39,216	0	30,839	8,377
Northwestern Great Plains Riparian	28,361	42,259	15	8,097	1,811	6,301	0	8,112	0	6,301	1,811

**Table 4-6**  
**ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by**  
**Alternative (Acres)**

Habitat Type	Non-BLM <sup>1</sup>		Alternative A		Alternative B			Alternative C		Alternative D	
	GH	PH	Avoidance <sup>2</sup>	Neither <sup>3</sup>	Avoidance <sup>4</sup>	Exclusion <sup>5</sup>	Neither <sup>3</sup>	Exclusion <sup>6</sup>	Neither <sup>3</sup>	Avoidance <sup>7</sup>	Neither <sup>3</sup>
Northwestern Great Plains Shrubland	5,255	409	78	1,526	1,529	75	0	1,603	0	75	1,529
Open Water Fresh	1,610	1,166	28	307	132	203	0	335	0	203	132
Pasture/Hay	25,694	739	2	10	8	4	0	12	0	4	8
Rocky Mountain Alpine Montane Wet Meadow	1,152	0	0	1	1	0	0	1	0	0	1
Rocky Mountain Cliff, Canyon and Massive Bedrock	35	0	0	104	99	5	0	103	0	5	99
Rocky Mountain Lodge pole Pine Forest	1,058	0	0	4	4	0	0	4	0	0	4
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	6,125	0	0	4	4	0	0	4	0	0	4
Rocky Mountain Subalpine Dry Mesic Spruce-Fir Forest and Woodland	62	0	0	1	1	0	0	1	0	0	1
Rocky Mountain Subalpine Montane Mesic Meadow	25,156	0	0	21	21	0	0	21	0	0	21
Western Great Plains Badland	32,142	4,986	2,412	22,808	22,427	2,793	0	25,220	0	2,793	22,427
Western Great Plains Cliff and Outcrop	208	17	3	110	72	41	0	112	0	41	72

**Table 4-6**  
**ReGAP Habitat Type including Non-BLM Acreage in PH and GH within Right-of-way Avoidance and Exclusion Areas by**  
**Alternative (Acres)**

Habitat Type	Non-BLM <sup>1</sup>		Alternative A		Alternative B			Alternative C		Alternative D	
	GH	PH	Avoidance <sup>2</sup>	Neither <sup>3</sup>	Avoidance <sup>4</sup>	Exclusion <sup>5</sup>	Neither <sup>3</sup>	Exclusion <sup>6</sup>	Neither <sup>3</sup>	Avoidance <sup>7</sup>	Neither <sup>3</sup>
Western Great Plains Closed Depression Wetland	109	105	0	21	3	18	0	21	0	18	3
Western Great Plains Open Freshwater Depression Wetland	68	54	0	43	0	43	0	43	0	43	(0)
Western Great Plains Saline Depression Wetland	203	2,920	0	392	17	375	0	392	0	375	17
Western Great Plains Sand Prairie	26,780	19,605	5	5,535	2,992	2,548	0	5,539	0	2,548	2,992
Western Great Plains Wooded Draw and Ravine	2,812	2,028	30	931	606	355	0	961	0	355	606
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	88	0	0	0	0	0	0	0	0	0	0
<b>Grand Total</b>	<b>899,659</b>	<b>974,735</b>	<b>9,920</b>	<b>335,626</b>	<b>112,329</b>	<b>233,217</b>	<b>0</b>	<b>345,547</b>	<b>0</b>	<b>233,217</b>	<b>112,329</b>

<sup>1</sup>Non-BLM acreage includes state lands, privately owned land, and other lands not managed.

<sup>2</sup>Alternative A avoidance acreage is existing protective habitat within BLM-administered lands.

<sup>3</sup>Neither is BLM-administered land outside of the ROW avoidance and exclusion areas that is not protective of GRSG habitat.

<sup>4</sup>Alternative B avoidance acreage is equal to BLM GH.

<sup>5</sup>Alternative B exclusion acreage is equal to BLM PH.

<sup>6</sup>Alternative C exclusion acreage is equal to BLM GH + BLM PH.

<sup>7</sup>Alternative D avoidance acreage is equal to BLM PH.

**Impacts from Range Management**

As shown in **Table 4-7**, AUMs and Acres Available for Grazing in Decision Area, currently, 570,112 acres in the planning area are open for livestock grazing, with 103,806 available AUMs. Livestock grazing would remain closed on 6,781 acres.

**Table 4-7**  
**AUMs and Acres Available for Grazing in Decision Area**

<b>Resource Use</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Available AUMs	n/a	69,408	0	69,408
Acres open to grazing in planning area	n/a	337,165	0	337,165

Livestock grazing would continue to be managed through existing grazing plans, with methods and guidelines from the existing RMPs followed. Continuation of these policies could indirectly preserve existing sagebrush habitat through consideration of vegetation potential, and adjustments to livestock use when necessary. This is in accordance with BLM grazing regulations 43 CFR, Part 4180, Fundamentals of Rangeland Health, which require appropriate action be implemented when current livestock grazing management is a significant factor in failing to achieve standards. Appropriate action would result in the significant progress toward fulfilling the standards and significant progress toward conforming to the guidelines. As discussed above under *Nature and Type of Effects*, grazing practices may have negative, neutral, or positive effects on vegetation; land health assessments and other management evaluations would be intended to identify areas of concern to maintain or improve rangeland health, which would improve vegetation condition.

Noxious weed control would be the responsibility of the affected permittee or lessee under weed control cooperative range improvement agreements. Each year, they would provide the BLM with records and maps of treatment areas.

Riparian habitats would be managed to achieve PFC and the desired plant community. Livestock management would be compatible with achieving these conditions. Together, these management actions would help to enhance riparian vegetation health and reduce impacts caused by livestock, such as trampling and overuse of riparian areas.

Range improvements would be designed to meet both wildlife and range health objectives. Development of range improvements on erodible soils would be avoided in springs. These approaches would help protect sagebrush ecosystems by supporting rangeland health and reducing the likelihood of surface disturbance in sensitive areas.

**Impacts from Fluid Minerals**

Under Alternative A, fluid mineral development could occur on currently leased lands. Development in these areas would continue to cause impacts on vegetation as described under impacts described under *Nature and Type of Effects*, including removal or degradation of vegetation and potential spread of invasive species.

**Impacts from Solid Minerals**

No lands would be recommended for withdrawal from locatable mineral entry under Alternative A (**Table 4-8**, Withdrawal from Locatable Mineral Entry in Decision Area). However, mitigation measures to prevent unnecessary degradation would be applied, which would reduce impacts on vegetation from surface disturbance, including those described under *Nature and Type of Effects*.

**Table 4-8  
Withdrawal from Locatable Mineral Entry in Decision Area**

<b>Resource Use</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Acres for withdrawal from locatable mineral entry	0	279,097	453,969	0

Note: Acres for withdrawal in PH/GH for Alternatives B, C, and D; no PH or GH is designated under Alternative A.

**Impacts from Fire and Fuels Management**

Fire and fuels management under Alternative A would not specifically protect sagebrush vegetation, although prescribed burning may be used in support of resource management objectives, such as restoring grassland or shrubland, reducing conifer encroachment, or increasing age-class variety. As a result, vegetation condition and desired species composition would be improved in certain areas. Further, chemical weed treatments applied following prescribed burns would limit the expansion of weeds or invasive species in the burned area and facilitate revegetation of native species.

Intensive wildfire suppression in high-value areas, such as sagebrush, fire-sensitive woody riparian areas, and commercial forests, would protect mature vegetation in these areas, but could also increase fuel load. Impacts from fire, including those described under *Nature and Type of Effects*, would continue under Alternative A.

**Impacts from Habitat Restoration and Vegetation Management**

Under Alternative A, BLM would continue to incorporate habitat restoration and vegetation objectives in management actions, which would improve vegetation conditions and increase the extent of native vegetation in areas where they are applied. In particular, BLM would manage for the benefit of vegetation that provides wildlife forage, forbs, and big and silver sage. Use of

native species would be used when possible, but not required, allowing for some introduced species in areas where they are necessary for site stabilization.

***Impacts from ACECs***

BLM would continue to manage 2,463 acres as the Acid Shale-Pine Forest ACEC to protect its unique pine forest and shale landscape.

**4.4.5 Alternative B**

***Impacts from Travel and Transportation Management***

Travel and transportation management under Alternative B would likely reduce impacts on vegetation from roads and motorized vehicles by limiting motorized vehicles to existing roads and trails, evaluating the need to permanently or seasonally close roads or areas to traffic in PH and restoring roads by re-seeding with appropriate seed mixes and considering the use of transplanted sagebrush. Restoration of sagebrush habitat and minimizing surface disturbances in sagebrush habitat would enhance vegetation and restore habitat to a greater extent than current policy under Alternative A.

***Impacts from Recreation***

Management proposed under Alternative B would reduce impacts on vegetation from recreation as described under *Nature and Type of Effects* by limiting issuance of SRPs in PH. Such management would restrict potentially damaging recreational uses of these areas associated with SRPs, although impacts from dispersed recreation, such as hiking, biking, or equestrian activities, would continue to disturb vegetation in areas where they occur.

***Impacts from Lands and Realty***

Establishing ROW exclusion and avoidance areas would protect vegetation in areas where they are applied as described above under *Nature and Type of Effects*. Under Alternative B, BLM would manage PH as ROW exclusion areas (233,219 acres). GH would be ROW avoidance areas. ROW exclusion areas would protect vegetation from disturbance and fragmentation, but could also have the effect of pushing development onto adjacent private lands with less management oversight. **Table 4-6** shows ROW avoidance and exclusion areas for sagebrush by ReGAP vegetation type. Measures under Alternative B would protect nearly 73 times more BLM sagebrush acreage than Alternative A in ROW avoidance or exclusion areas. In addition, reclamation of out-of-use ROWs would increase the extent and connectivity of vegetation communities.

Retention of BLM-administered lands in PH with limited exceptions would reduce the likelihood of vegetation removal or fragmentation associated with agricultural or urban development that could occur on state or private lands.

***Impacts from Range Management***

Under Alternative B, there would be no change to the acreage open for grazing or available AUMs described under Alternative A, as shown in **Table 4-7**.

However, BLM would implement a number of management actions in PH to incorporate GRSG habitat objectives and management considerations into livestock grazing management. Appropriate action would result in the possible increase in the number of acres meeting Rangeland Health Standards. Together, these efforts would reduce, but would not eliminate, impacts from grazing on vegetation communities described under *Nature and Type of Effects*. In addition, such management would promote the health of GRSG habitats, including sagebrush steppe, riparian areas, and wet meadows. Impacts from noxious weed control are the same as under Alternative A.

***Impacts from Fluid Minerals***

Additional restrictions on fluid mineral development proposed under Alternative B would reduce the impacts on vegetation compared to Alternative A. Exploration within PH would be permitted to obtain information for adjacent areas. RDFs and conservation measures would be applied as COAs to existing leases within PH in order to protect GRSG habitat from loss of sagebrush acreage and fragmentation of habitat. These restrictions on fluid mineral development would protect more acres of vegetation from associated activities compared to Alternative A, and would reduce the impacts from fluid mineral exploration and development described under *Nature and Type of Effects*.

***Impacts from Solid Minerals***

Alternative B would reduce impacts on vegetation associated with solid mineral exploration and extraction activities compared with Alternative A (see **Table 4-8**). All PH would be recommended for withdrawal from mineral entry and closed to nonenergy leasable mineral leasing and to salable mineral disposal. BMPs would be applied to existing leases and locatable mineral claims, and restoration would be required for existing salable mineral pits. These policies would decrease the number of acres of vegetation potentially impacted by solid mineral development compared to Alternative A, and a reduction in the likelihood of impacts from solid mineral exploration and extraction described under *Nature and Type of Effects*.

***Impacts from Fire and Fuels Management***

Fire and fuel management policies proposed under Alternative B would be designed to protect sagebrush ecosystems by maintaining sagebrush cover, applying seasonal restrictions, protecting winter range, and requiring use of native seeds. Post-fuels treatments and ES&R management would be designed to ensure long-term persistence of seeded areas and native plants. These proposed modifications to fire and fuel management would result in an increase in the protection of sagebrush vegetation compared to Alternative A, and a reduction in the likelihood of impacts from fire and fuels management described under *Nature and Type of Effects*.

Prioritizing fire suppression in PH and GH would protect mature vegetation from the destructive effects of wildfire but could result in increased fuel load

and spread of noxious weeds, which lead to larger and more severe wildfires in the long term.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Habitat restoration and vegetation management actions under Alternative B would aim to improve vegetation conditions and prioritize restoration efforts to benefit sagebrush vegetation. As a result, the restoration and vegetation management actions would enhance vegetation extent and condition relative to Alternative A by requiring the use of native seeds, designing post-restoration management to ensure the long-term persistence of the restoration efforts, considering changes in climate, and monitoring and controlling invasive species.

#### ***Impacts from ACECs***

Impacts on vegetation in the Acid Shale-Pine Forest ACEC would be similar to Alternative A. Additional RDFs and conservation measures in PH would further reduce impacts on vegetation, as described under the *Nature and Type of Effects*.

### **4.4.6 Alternative C**

#### ***Impacts from Travel and Transportation Management***

Impacts from travel and transportation management would be similar to Alternative B, although impacts on vegetation (as described under the *Nature and Type of Effects*) would be further reduced since protections would apply to both PH and GH, and the BLM would apply additional mitigation requirements. Prohibiting road construction within four miles of a lek would reduce the amount of land available for future road construction and would help prevent fragmentation of vegetative communities.

#### ***Impacts from Recreation***

Impacts are the same as under Alternative A.

#### ***Impacts from Lands and Realty***

Similar to Alternative B, the measures proposed under Alternative C would reduce the impacts of ROWs on vegetation. PH and GH would be ROW exclusion areas (345,560 acres). ROW exclusion areas would protect vegetation on BLM-administered land, as described above under *Nature and Type of Effects*, but could have the unintended consequence of pushing development onto adjacent private lands. **Table 4-6** shows vegetation type in ROW avoidance and exclusion areas by ReGAP vegetation type. Measures under Alternative C would protect both PH and GH sagebrush acreage (214,297 acres) as ROW exclusion areas, and since more GRS habitat is located on land not administered by the BLM, ROW exclusion areas on BLM-administered land could push ROW construction onto adjacent private lands with less management oversight. This may result in fewer protections for vegetation and increased removal and fragmentation of sagebrush.

As under Alternative B, public ownership would be maintained in PH, but without the exceptions provided under that alternative. Private lands, when offered, may be acquired in ACECs to enhance the GRSG conservation value of existing lands. Although it is uncertain how much private land would be acquired to enhance GRSG habitat under Alternative C, this policy would increase the acreage where vegetation condition would be improved compared Alternative A, as no such measures have been provided under Alternative A.

***Impacts from Range Management***

Under Alternative C, grazing would be removed on allotments within PH and GH (337,165 acres comprising 69,408 AUMs), resulting in zero acres and zero AUMs available in the decision area (as shown in **Table 4-7**). Removal of permitted grazing uses would reduce the impacts on GRSG and their habitat, such as loss of herbaceous cover, discussed under *Nature and Type of Effects*. However, grazing can be used to reduce fuel load and maintain vegetation health and diversity. Thus, removing grazing may diminish rangeland health and wildlife habitat quality in the long term. Action may result in the number of acres meeting Rangeland Health Standards being stable or potentially decreasing. Removing livestock grazing from BLM-administered land would also eliminate the opportunity to initiate weed control cooperative range improvement agreements for noxious weed control on affected lands. All noxious weed control efforts would be done by BLM personnel, which may increase weed distribution and patch sizes. Other impacts would be similar to those described under Alternative B.

***Impacts from Fluid Minerals***

Fluid minerals management under Alternative C would be similar to that described for Alternative B, but would include several more restrictive RDFs and conservation measures that would be applied to existing leases as COAs, thereby enhancing vegetation protection. In addition, actions would be applied to both PH and GH, which would increase the area of vegetation that would be protected. These measures would reduce habitat degradation and fragmentation associated with mineral extraction, including those impacts described under *Nature and Type of Effects*.

***Impacts from Solid Minerals***

Impacts from solid minerals management would be the same as Alternative B, but would be applied to a larger area (PH and GH), and would thus provide greater protection for vegetation over the long term.

***Impacts from Fire and Fuels Management***

Impacts from fire and fuels management would be similar to those described for Alternative B, but would be applied to a larger area (PH and GH), and would thus provide greater protection for vegetation over the long term.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Impacts from habitat restoration and vegetation management would be similar to those described for Alternative B, but would be applied to a larger area (PH and GH), and would thus provide greater protection for vegetation over the long term.

#### ***Impacts from ACECs***

ACECs to protect GRSG would be designated as sagebrush reserves on 96,246 acres. Vegetation within areas designated as ACECs would be protected from surface disturbance by increased management focus and restrictions on surface-disturbing activities in these areas.

### **4.4.7 Alternative D**

#### ***Impacts from Travel and Transportation Management***

Measures proposed under Alternative D would reduce impacts on GRSG habitat compared to Alternative A. Many management actions would be similar to Alternative B, with increased management flexibility incorporated to improve management and target those areas that need most protection. Overall, management under Alternative D would reduce impacts on vegetation from activities associated with travel and transportation in the planning area, including those described under *Nature and Type of Effects*, compared to Alternative A.

#### ***Impacts from Recreation***

Impacts would be the same as Alternative B.

#### ***Impacts from Lands and Realty***

Lands and realty management proposed under Alternative D would provide increased protection of vegetation compared to Alternative A. PH would be ROW avoidance areas (233,219 acres) and ROWs would be allowed in GH with appropriate mitigation measures. **Table 4-6** shows acres of land in ROW avoidance and exclusion areas by ReGAP vegetation type. Measures under Alternative D would protect the same amount of PH as Alternative B (169,598 acres) but in ROW avoidance areas, rather than ROW exclusion areas. These measures would protect vegetation, while providing more management flexibility to site ROWs in less sensitive locations. Mitigation measures applied in GH would reduce, but would not eliminate, impacts associated with ROW development described under *Nature and Type of Effects*.

Impacts from land tenure decisions would be the same as Alternative B.

#### ***Impacts from Range Management***

Under Alternative D, there would be no change to the acreage open for grazing or available AUMs, as shown in **Table 4-8**. Management under Alternative D would be similar to that described for Alternative B, with increased collaboration with stakeholders, guidance for prioritization of efforts, and increased tools available to improve flexibility in management. Appropriate

action would result in the possible increase in the number of acres meeting Rangeland Health Standards. As such, impacts would likely be similar to Alternative B, though increased management flexibility may improve management and target those areas that need most protection. Impacts from noxious weed control are the same as under Alternative B.

***Impacts from Fluid Minerals***

Under Alternative D, impacts would be reduced in comparison to Alternative A by applying RDFs and conservation measures as COAs to existing leases. The conservation measures would be designed to reduce surface disturbances associated with mineral extraction and would provide guidance for mitigation. Such management would reduce disturbance to vegetation associated with fluid mineral development described under *Nature and Type of Effects*.

***Impacts from Solid Minerals***

Impacts under Alternative D would be similar to those described for Alternative B. However, proposed actions for locatable mineral development would be analyzed on a case-by-case basis in cooperation with the State of Montana and reviewed to avoid unnecessary degradation of GRSG habitat. These actions would reduce, but would not eliminate, impacts from locatable mineral development on vegetation compared to Alternative A, including those described under *Nature and Type of Effects*.

***Impacts from Fire and Fuels Management***

Impacts from fire and fuels management would be similar to those described for Alternative B. In addition, fuels management projects in PH would be designed to incorporate greater flexibility to maximize the acreage protected and ES&R treatments would be monitored. These proposed modifications to fire and fuel management would result in an increase in the protection of sagebrush vegetation compared to Alternative A, and a reduction in the likelihood of impacts from fire and fuels management described under *Nature and Type of Effects*.

***Impacts from Habitat Restoration and Vegetation Management***

Impacts from habitat restoration and vegetation management under Alternative D would be similar to those described for Alternative B. However, this alternative includes consideration of other threatened, endangered, or sensitive species, which may change the proportions of vegetation communities that would be protected in certain instances.

***Impacts from ACECs***

Impacts would be the same as under Alternative B.

## 4.5 WILDLAND FIRE MANAGEMENT AND ECOLOGY

### 4.5.1 Methods and Assumptions

#### *Indicators*

**Table 4-9**, Comparison of Wildland Fire Management and Ecology Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on wildland fire management and ecology under each alternative.

**Table 4-9**  
**Comparison of Wildland Fire Management and Ecology Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Alteration of vegetative cover that is likely to result in a substantial shift in FRCC across the planning area	No change	Minor increased possibility	Minor increased possibility	Minor increased possibility
A substantial change in the likelihood or severity of wildland fire (based on level of restrictions on uses that may introduce sources of ignition)	Fires more likely to occur, due to few restrictions	Fires less likely to occur, due to restrictions that reduce risk of fire	Fires are more likely as a result of increased fine fuels from removing grazing	Fires are less likely due to restrictions that reduce risk of fire
Management actions that substantially inhibit a response to wildland fire or appropriate treatments to prevent wildland fire	No change	No change	Increase	No change

#### *Assumptions*

The analysis includes the following assumptions:

- Fire is an important functional, natural disturbance in many of the ecological systems found in the planning area.
- A direct relationship exists between fuel loading and potential fire intensity and severity.
- Demand for fuels treatments would likely increase over the life of this plan.

### 4.5.2 Nature and Type of Effects

Impacts on wildland fire management result from changes in fire frequency and intensity, and the ability to employ fire-suppression methods, all of which would affect management of fire and related costs within the planning area. As discussed in **Section 3.6** the majority of lands in the decision area have moderate to high level of departure from historic conditions and related fire risk. Actions which change condition class from highly altered ecosystems to

one closer to historical conditions could reduce the risk of losing key ecosystems as well as decrease fire risk and management costs in the long term.

Many different resource uses may introduce additional ignition sources into the planning area, which increase the probability of wildland fire occurrence and the need for fire-suppression activities. Fire intensity can be affected by activities that decrease fuel loading, such as vegetation treatments and harvesting of timber products, and activities that alter the composition and structure of vegetation communities. High-intensity fires generally result in a greater loss of vegetation cover, changes to soil chemistry, damage to root structures, and a greater ability for non-native species to become established (Verma and Jayakumar 2012).

Transportation and travel management can impact fire frequency by changing the level of risk of human caused ignitions. The risk of ignition is increased where travel is less restrictive, particularly where motorized vehicles travel cross-country. All forms of travel encourage the spread of invasive weeds (CEC 2012), particularly cheat grass, which can shift fire regimes and increase fire behavior potential. Conversely, if management restricts access, wildfire risk may be decreased. In addition, transportation management may impact fire suppression efforts; when routes are closed and rehabilitated, they become unavailable for response to wildfires, limiting access opportunities.

Similarly, the level and type of recreation permitted can impact fire risk. Increased recreational use may increase the probability of unintentional fire starts from human caused ignitions and the need for fire suppression. Recreation management may reduce this risk by providing targeted activities and outcomes.

Surface disturbance caused by development would generally contribute to the modification of the composition and structure of vegetation communities (including increases in noxious weed proliferation) in the vicinity of developed areas, which could then be more likely to fuel high-intensity fires. This could cause an increase in program costs because of the increased potential for fire.

Lands and realty actions may indirectly result in development and associated fire risk. For example, issuance of land use authorizations can result in indirect impacts by increasing the risk of human-caused ignition should construction of transmission lines, renewable energy projects, or other development occur.

Likewise, the development of energy and minerals resources could increase the risk of wildfires by introducing new ignition sources (Shlisky et al. 2007). Associated facilities, infrastructure and transmission lines can increase fire and fuels program costs while decreasing fire management flexibility with regards to suppression options. Energy development also poses hazards to firefighters, including unknown toxins, facility protection, evacuation of industry personnel, and dangerous overhead power lines. Fire programs could incur additional costs

to train firefighting personnel for emergency situations associated with energy development.

Limitations on mineral development would have an indirect effect of decreased fire but only when additional leasing would otherwise be likely to occur. This would be due to less development, fewer vehicles, and less construction equipment, all of which would decrease the chance of human ignition. In areas with limited potential for development, changes to mineral management are likely to have negligible impacts on fire management.

The potential for invasive species establishment or increase may follow construction and could impact fire management actions through increased risk of fire and need for fire management.

Range grazing management can impact the ability to manage fire as a natural process through changes in fine fuels availability (e.g., grasses). Livestock grazing reduces fuel loads, so retiring allotments may lead to increased fuels in site specific locations. Conversely, increasing AUMs could reduce fuel loads.

Vegetation and weed treatments that decrease standing vegetation could decrease the intensity of wildland fires and allow fires to be more easily controlled. For example, efforts to reduce incursion of nonnative annual grasses (primarily cheatgrass), and proliferation of other noxious and invasive weeds, would promote healthy plant communities and an associated lower risk of high-intensity wildfire (USGS 2006). Used appropriately, prescribed fire would be compatible with noxious weed control; however, the presence of noxious weeds and the potential of weeds to spread after a prescribed fire would need to be monitored on a site-specific basis. Conversely, management actions that retain shrub and cover may result in increased fuel loading and increase the likelihood and intensity of wildland fire.

Management actions that are intended to improve, create, or re-establish healthy ecological conditions in various vegetation types benefit the fire and fuels program in the long term by promoting the most efficient use of fire and fuels fire management program resources. Conversely, prioritizing fire suppression can limit management options and increase costs for fire management programs.

Special designations, such as ACECs, and the management of sensitive resources can restrict fuels treatments on a site-specific basis. For example, in areas where preservation of particular species or habitats is emphasized, management options and fuels treatments may be limited.

Impacts from mineral split estate are covered under the discussions of impacts from fluid and solid minerals. As such, there is no further discussion of mineral split estate in this section.

### 4.5.3 Impacts Common to All Alternatives

#### ***Impacts from Travel and Transportation Management***

As all alternatives would limit motorized and mechanized travel to existing routes, fire risk would be minimized due to lack of off-road motorized travel. In addition, site-specific travel management would be implemented with designation of roads as well as seasonal and permanent closures, where appropriate. Due to these management actions, impacts across all alternatives would have similarities, although the areas prioritized for travel designation planning would vary by alternative. Administrative access would be maintained for fire suppression and fire management activity except in the case of road closure and rehabilitation; therefore, the impacts on access would be minimal.

#### ***Impacts from Solid Minerals***

There is currently no coal development in the planning area, but any coal development within the planning area would require a plan amendment EIS. Due to this, impacts on fire management from coal would be negligible across all alternatives.

### 4.5.4 Alternative A

#### ***Impacts from Travel and Transportation Management***

As described under *Impacts Common to all Alternatives*, travel would be limited to existing routes and site specific travel management plans would be completed slightly decreasing the likelihood of human caused ignition due to site-specific restrictions on access. Fire risk from human-caused ignitions would be minimized due to lack of off-road motorized travel.

#### ***Impacts from Recreation***

Under Alternative A, there are no recreation management actions that would result in impacts on fire management.

#### ***Impacts from Lands and Realty***

Alternative A places the fewest restrictions on ROW development; restrictions would be imposed on a case-by-case basis. Under this alternative, two areas in the decision area (9,708 acres) continue to be managed as ROW avoidance areas, with no land managed as a ROW exclusion area. As discussed under *Nature and Type of Effects*, fire risk could be increased as a result of development from ROW authorizations; therefore, this alternative would have a high potential for impacts from lands and realty on fire management.

#### ***Impacts from Range Management***

Under Alternative A, grazing of all classes of livestock would be open on 337,165 acres of BLM-administered land in the decision area. Additionally, Alternative A would allocate up to 69,408 AUMs in the decision area. Allowing grazing throughout the majority of the planning area may decrease the risk of wildfire due to the reduction in fuel load caused by livestock grazing. Land

treatments for livestock forage would be conducted as needed to effectively manage livestock, treatments could reduce fuels and the risk of wildland fire as described under *Nature and Type of Effects*.

***Impacts from Fluid Minerals***

Under Alternative A, fluid mineral could be developed on currently leased lands. Alternative A places the fewest restrictions on fluid minerals. Due to this, the chance of human ignition under this alternative would be the highest and could indirectly effect fire management through increased fire risk as discussed under *Nature and Types of Impacts*.

***Impacts from Solid Minerals***

Alternative A has the greatest number of acres open to mineral exploration, development, and mining operations for salable minerals, nonenergy leasables, and new locatable mineral development. This increases the risk of human-ignited fire. Alternative A could impact fire management through increased human-caused ignition where exploration development or mining occurred. There is currently no coal development in the planning area. Under Alternative A, the planning area would continue to be available for coal exploration licenses; however, any coal development within the planning area would require a plan amendment EIS, so impacts would be minimal.

***Impacts from Fire and Fuels Management***

Alternative A would place few restrictions on fire and fuels management, and therefore would have the fewest impacts on fire management. Alternative A would allow for the continued use of prescribed burning in support of resource management objectives and would allow for the continued use of mechanical and chemical treatments. Intensive fire suppression would be applied to protect public safety and property an areas with high resource value.

Due to the flexibility in management of prescribed and wildland fires, fire suppression costs are likely to be the lower under Alternative A as compared to all action alternatives.

***Impacts from Habitat Restoration and Vegetation Management***

Under Alternative A, surface disturbing activities greater than a 1/4 acre would require rehabilitation and re-vegetation using primarily native plants. The use of native plants under this alternative could contribute to healthy plant communities and an associated lower risk of high-intensity wildfire. Vegetation could be managed to alter fuel loads and management activities could be conducted as appropriate to meet resource needs under this alternative. Impacts on fire management would therefore be lower under Alternative A than under all action alternatives.

***Impacts from ACECs***

Under this alternative no new ACECs would be designated to protect GRSG habitat; therefore, there would be no new restrictions on fire management from

ACECs. This flexibility in GRSG habitat could allow fire and fuels management to function at greater efficiency and lower costs.

#### **4.5.5 Alternative B**

##### ***Impacts from Travel and Transportation Management***

As described under *Impacts Common to all Alternatives*, travel would be limited to existing routes. Under Alternative B, route construction would be limited in PH, and the use of existing roads would be emphasized. Additional restrictions would be placed on upgrades, route construction, and realignment. This would further limit the risk of human-caused ignition in PH by reducing exposure to machinery, vehicles, and personnel. However, closing roads could have some impacts on the ability to respond to fire due to reduced access.

##### ***Impacts from Recreation***

Alternative B would only allow SRPs in PH that have neutral or beneficial effects on PH areas. SRPs that have neutral or beneficial effects on PH areas would likely not include recreation involving motorized vehicles. As such, this management action would likely decrease the risk of human-caused ignitions and the subsequent strain on fire management.

##### ***Impacts from Lands and Realty***

The number of acres managed as ROW exclusion areas and ROW avoidance areas combined would be larger under Alternative B than under any other alternative. Alternative B would manage 233,219 acres as ROW exclusion areas and 112,341 acres as ROW avoidance areas (102,633 acres more than under Alternative A). Managing PH as an exclusion area for new ROW authorizations would reduce the potential for development and the associated fire risk and suppression costs on BLM-administered lands. However, there could be increased development on private lands with associated fire risks.

##### ***Impacts from Range Management***

Alternative B allows for the same number of AUMs as Alternative A; however, management actions may impact fire management.

Under Alternative B, retirement of permitted grazing uses could lead to increased fuels in those site-specific locations, as discussed under *Nature and Type of Effects*. In addition, only forage treatments which would also enhance GRSG habitat would be permitted, with additional potential for increase in fuels. However, management focused on achieving ecological site potential would likely reduce invasive species and increase habitat health, and could decrease the risk of fire and consequently reduce the need to respond to human-fueled ignitions in the area in the long term.

Assessment of land health and changes to grazing systems to achieve objectives would be prioritized in PH; therefore, the impacts of range management actions in Alternative B would be focused on these areas.

***Impacts from Fluid Minerals***

Under Alternative B, fluid mineral development could occur on currently leased lands. RDFs and conservation measures would be applied to existing leases as COAs in PH. These measures would limit surface occupancy on federal leases as well as impose seasonal limits on exploratory drilling. These measures would place restrictions on development in PH with a related decrease in fire risk in this portion of the planning area.

***Impacts from Solid Minerals***

Under Alternative B, surface mining of coal would be prohibited in PH and new mining leases would also be prohibited, unless all surface disturbances were placed outside of PH. PH would be closed to salable mineral disposal as well as nonenergy leasable and the area would be proposed for withdrawal from new locatable mineral development. These actions would reduce the impact from solid minerals on fire management within PH because development that could increase the risk of human-caused ignition would not occur in PH.

***Impacts from Fire and Fuels Management***

Under Alternative B, fuel treatments would be allowed on a limited basis with an emphasis on protecting existing sagebrush ecosystems in PH. Management options for fuels treatments in PH would be limited in this alternative. In addition, suppression of wildland fire to protect GRSG habitat would be emphasized along with public safety and property. Restrictions placed on fire and fuels management under this alternative, such as seasonal closures, no treatments in known winter range, and restrictions on the use of fire to treat sagebrush in low precipitation zones, could impact the ability to efficiently manage fuels and could increase costs of vegetation management and fire suppression.

Under this alternative the use of livestock to reduce fuel loads would be evaluated. This could provide one option to decrease the risk of wildfire and consequently reduce strain on fire management, particularly in PH.

***Impacts from Habitat Restoration and Vegetation Management***

Under Alternative B, many of the management actions focus on the use of native plants in order to create landscapes that most benefit the GRSG. The emphasis of native plants under this alternative could contribute to healthy plant communities and an associated lower risk of high-intensity wildfire. However, habitat parameters could also limit the options for fuels treatment and could therefore increase costs of treatment compared to Alternative A.

Specifically, fire and fuels management may be impacted by the requirement to use native seeds whenever possible for restoration. Since the introduction and establishment of exotic plants species can contribute to a departure from historic fire regimes, a focus on native plants can create a habitat that is less susceptible to wildfires; therefore, places less burden on fire management programs (Hann and Bunnell 2001).

***Impacts from ACECs***

Impacts would be the same as under Alternative A.

**4.5.6 Alternative C**

***Impacts from Travel and Transportation Management***

Travel management actions would be similar to that described in Alternative B, but would be applied to both PH and GH. Risk of human-caused ignition would slightly decrease for both PH and GH, as compared to Alternative A. Due to limitations on new roads in most PH, access for fire management may be reduced, resulting in increased time or cost for suppression compared to Alternative A.

***Impacts from Recreation***

Impacts would be the same as under Alternative A.

***Impacts from Lands and Realty***

Alternative C would manage 345,560 acres as ROW exclusion area. Under this alternative, zero acres would be managed as ROW avoidance area. The restrictions placed on ROWs under this alternative would likely restrict the amount of construction and motorized travel to and from construction sites that would occur on GRSG habitat. Due to the restrictions on ROW development in PH and GH under this alternative, potential fire risks from lands and realty actions would be the least of any alternative.

***Impacts from Range Management***

Due to the reduced number of AUMs in PH and GH (0 AUMs permitted, 100 percent less than Alternative A) and the large number of areas closed to livestock grazing under this alternative (337,165 acres), the fuel load in PH and GH would be higher and the risk of fire would be greater under this alternative than the others. In addition, grazing management actions to improve forage for livestock may indirectly reduce fuels on BLM-administered lands as well as adjacent private lands where grazing occurs. Leases/permittees can also act as important partners in fire suppression activities.

***Impacts from Fluid Minerals***

Under Alternative C, fluid minerals could be developed on currently leased lands. Restrictions on fluid minerals would be similar to that described under Alternative B but would be applied to PH and GH. Seasonal restrictions would be further expanded, further decreasing the potential for human-related fire ignition from exploration and development.

***Impacts from Solid Minerals***

Management actions under Alternative C would be similar to those described under Alternative B, except would extend to both PH and GH. This would result in a further reduced risk of human-caused ignition, which would result in an even lower risk of impacting fire management.

***Impacts from Fire and Fuels Management***

Under Alternative C, impacts would be similar to those applied under Alternative B, but would be applied to both PH and GH. The restrictions placed on fire management would be more stringent under this alternative, which would result in greatest impacts on the fire and fuels management program. Increases in restrictions on fire management could result in increased program costs. Costs of suppression are likely to be highest under Alternative C due to the emphasis of suppression within both PH and GH.

***Impacts from Habitat Restoration and Vegetation Management***

Impacts under Alternative C would be similar to those under Alternative B, except that management actions under Alternative C would apply to both GH and PH; therefore, the potential for long-term benefits to ecosystem health could be slightly increased, but the costs for treatments also would increase.

***Impacts from ACECs***

Under Alternative C, an ACEC covering 96,246 acres would be designated to protect GRS habitat. There could be reduced flexibility for hazardous fuels treatments on the 96,246 acres managed as an ACEC. The reduction in flexibility could result in higher program costs and could reduce the programs ability to efficiently suppress fires within the ACEC.

**4.5.7 Alternative D**

***Impacts from Travel and Transportation Management***

Impacts would be similar to that described under Alternatives B and C. However, under Alternative D, new routes could be built if criteria are met. This would reduce the risk of human-caused ignitions because travel would be on designated routes rather than potentially as cross-country travel. Additionally, construction of new roads may increase access for fire management, resulting in decreased time or cost for suppression.

***Impacts from Recreation***

Impacts would be the same as under Alternative B.

***Impacts from Lands and Realty***

Under Alternative D, 233,219 acres would be managed as ROW avoidance area, which is 223,511 acres more than under Alternative A. ROWs would be allowed in GH with measures to minimize surface-disturbing and disruptive activities. Similar to Alternative A, no land would be managed as ROW exclusion areas, and no land would be identified for withdrawal. Development could still occur, resulting in the potential for human-related ignitions. Having only avoidance areas would allow for infrastructure in areas with the least impact on coordination with adjacent private lands.

***Impacts from Range Management***

Impacts under Alternative D would be similar to those under Alternative B, but with additional measures taking into account local conditions and resources and working with state and federal agencies. As a result, impacts on fire management are similar to those described under Alternative B, but they may be more suited to site-specific conditions, resulting in improved ecological conditions and decreased fire risk. Costs and time for fire management activities may also be reduced.

***Impacts from Fluid Minerals***

Impacts under Alternative D would be similar to those in Alternative B for exploration activities. Conservation measures specific to GRSG management would be applied to existing leases as COAs, but with greater flexibility for site specific modifications. There would be potential for fire risk from development activities, but risk should be decreased compared to Alternative A.

***Impacts from Solid Minerals***

Locatable mineral exploration and some salable mineral disposal would be permitted. This would result in impacts similar to those described under Alternative A. Coal exploration licenses would be available, but due to the requirement for a plan amendment for coal development, impacts would be limited.

***Impacts from Fire and Fuels Management***

Under Alternative D, impacts would be similar to those described in Alternative C, with restrictions on fuels treatment options in both PH and GH. In Alternative D, the emphasis would also be placed on tailoring management objectives to local site conditions and monitoring sites to ensure treatments are helping to meet objectives; therefore, habitat may be further improved in the long term. Fire suppression actions and related impacts would be the same as described under Alternative B.

***Impacts from Habitat Restoration and Vegetation Management***

Impacts under Alternative D would be similar to those in Alternative B, but would include provisions to restore habitat for other priority species in the project area and to consult with local landowners to coordinate management. As a result, actions may be undertaken in a manner consistent with local site conditions, improving the habitat and decreasing fire risk and costs in the long term.

***Impacts from ACECs***

Impacts would be the same as under Alternative A.

## 4.6 FLUID MINERALS

### 4.6.1 Methods and Assumptions

Analysis of impacts on fluid minerals from this RMPA focuses on the impacts of RDFs and conservation measures to protect GRSG. These impacts may be direct or indirect. For example, a direct impact on fluid minerals would result from application of COAs on existing leases. An indirect impact would result from removal of a road, which would change the economic feasibility of developing a site. Additional actions or conditions that might cause direct or indirect impacts on fluid minerals are described under *Indicators*, below.

#### *Indicators*

Indicators were developed and used to analyze impacts of the management actions under each alternative on fluid minerals. **Table 4-10**, Comparison of Fluid Minerals Indicators by Alternative, illustrates how the indicators vary under each alternative.

**Table 4-10**  
**Comparison of Fluid Minerals Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Application of COAs on fluid mineral development activities on leased parcels for the protection of GRSG	No change	Increase	Increase	Increase
Restrictions on geophysical exploration in GRSG habitat	No change	Increase	Increase	No change

#### *Assumptions*

The analysis includes the following assumptions:

- Oil and gas operations on existing federal leases, regardless of surface ownership, would be subject to COAs by the BLM Authorized Officer. The BLM can deny surface occupancy on portions of leases with COAs to avoid or minimize resource conflicts if this action does not eliminate reasonable opportunities to develop the lease.
- Valid existing leases would be managed under the stipulations in effect when the leases were issued.
- Management actions and conservation measures also apply to fluid mineral leasing on lands overlying federal fluid mineral estate. This includes federal mineral estate underlying BLM-administered lands, private lands, and state lands.
- 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 would be updated in the existing data inventory through plan maintenance.

- If an area has been leased, it could be developed; however, not all leases would be developed within the life of this RMPA.
- As the demand for energy increases, so would the demand for extracting energy resources.
- As discussed in **Section 3.7** the primary oil and gas fields within the planning area are largely played out. The level of oil and gas activity in the planning area is likely to remain relatively stable for the life of the Judith Resource Area (BLM 1994) and Headwaters (BLM 1984) Resource Management Plans with the possible exception of the Heath Shale play. Activity in the vicinity of the Heath Shale play could dramatically increase if this play proved to be economic.

#### 4.6.2 Nature and Type of Effects

The following analysis describes the nature and type of impacts that could affect fluid minerals in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area. Details on how the occurrence of each impact would vary by alternative are described under the various subheadings.

Buying out or cancelling leases in occupied habitat would prevent future development of existing oil and gas leases. However, in accordance with 43 CFR 3108.3, leases may only be cancelled by the Secretary of the Interior when 1) the lessee has a nonproducing well and fails to comply with the provisions of the law, regulations, or lease; or 2) the lease was improperly issued. Cancellation of a lease with a producing well requires a judicial proceeding.

Applying COAs, which include RDFs (per **Appendices C and D**) and conservation measures outlined in **Chapter 2 (Table 2-4)**, to existing leases would directly impact fluid mineral leasing. These RDFs and conservation measures would include standards such as noise restrictions, height limitations on structures, design requirements, water development standards, remote monitoring requirements, and reclamation standards. Application of these requirements through COAs would impact fluid mineral development by increasing its costs if it resulted in the application of additional requirements and/or use of more expensive technology (such as remote monitoring systems) than would otherwise have been used by operators. Impacts of these COAs would be mitigated where exceptions limit their application. This would occur where a COA was not applicable (e.g., a resource is not present on a given site) or where site-specific consideration merited slight variation. See **Section 2.4.3, Elements Common to Alternatives B, C, and D**, for more information on when these exceptions to RDFs would apply.

Placing limits on geophysical exploration could reduce the availability of data on fluid mineral resources and could increase costs of fluid mineral development if the limits required use of more expensive technology. Timing limitations on geophysical exploration would delay development activities and could cause equipment shortages because all exploration would be occurring during the same time period.

Requiring master development plans and unitization could cause direct impacts on fluid minerals through increased costs of fluid mineral extraction by delaying the permit approval process until such additional site-specific planning efforts are completed. However, unitization typically has been initiated at the operator's discretion.

Requiring bonds in the amount necessary to cover full reclamation upon completion of the project could deter fluid mineral exploration and development by increasing up-front costs when these costs could have previously occurred after economic resources had already been recovered.

Identification of areas in which to acquire additional surface or mineral estate containing GRS habitat would have no impacts on fluid minerals because it would not result in application of management actions to additional acres of surface or fluid mineral estate. If areas for acquisition were identified, acquisition would occur only in areas containing existing federal mineral leases, which are already subject to BLM management actions applicable to both the surface and the mineral estate through the fluid minerals program.

Implementing management for the following resources would have negligible or no impact on fluid minerals and are therefore not discussed in detail: travel and transportation management, recreation, lands and realty, range management, solid minerals, fire and fuels management, habitat restoration and vegetation management, and ACECs.

#### **4.6.3 Impacts Common to All Alternatives**

##### ***Impacts from Fluid Minerals (Including Mineral Split Estate)***

Under all alternatives, the BLM would continue to require a bond in accordance with 43 CFR 3104. The amount of the bond would have to be at least the minimum amount described in the regulations to “ensure...reclamation of the lease area(s) and the restoration of any lands or surface waters adversely affected by lease operations after the abandonment or cessation of oil and gas operations on the lease(s).”

#### **4.6.4 Alternative A**

##### ***Impacts from Fluid Minerals (Including Mineral Split Estate)***

Under Alternative A, existing oil and gas leases would continue to be developed according to their lease terms. BMPs and COAs could be applied to mitigate or

prevent impacts on BLM-administered lands or other resources. If COAs were applied, impacts would be the same type as those described under *Nature and Type of Effects*.

Geophysical exploration would continue to be allowed within the decision area under Alternative A.

#### **4.6.5 Alternative B**

##### ***Impacts from Fluid Minerals (Including Mineral Split Estate)***

Under Alternative B, RDFs and conservation measures would be applied as COAs to existing leases on 42,717 acres of PH with federal mineral estate (48 percent of the 89,761 acres of existing leases in the decision area). These actions would increase impacts on fluid minerals in comparison with Alternative A by requiring additional standards that could increase time and costs related to development. In addition to limitations on surface disturbance and timing of exploratory drilling, the COAs would require unitization when necessary to minimize harm to GRSG and may require the completion of Master Development Plans instead of processing individual APDs. Cost impacts of these required actions would be the same type as those described under *Nature and Type of Effects*. The BLM would not apply COAs that would eliminate reasonable opportunities to develop the lease.

Geophysical exploration would be allowed within the 385,693 acres of PH with federal mineral estate but would be subject to timing limitations (TLs) and other restrictions. Impacts would increase compared with Alternative A and would be the same type as those described under *Nature and Type of Effects*, including delays on development activities and could cause equipment shortages.

#### **4.6.6 Alternative C**

##### ***Impacts from Fluid Minerals (Including Mineral Split Estate)***

Management actions under Alternative C would be similar to those under Alternative B, but they would apply to existing leases on 73,691 acres of PH and GH with federal mineral estate (82 percent of the 89,761 acres of existing leases in the decision area). Management of geophysical exploration would be the same as under Alternative B but would apply to 639,927 acres of PH and GH. In addition to applying the restrictive management to more acres, Alternative C would call for COAs implementing seasonal restrictions on vehicle traffic and human presence associated with exploratory drilling. This alternative also would limit new surface disturbance on existing leases to three percent per section, with some exceptions. Additionally, the BLM would explore amendment, cancellation, and buyout of leases. Impacts of requiring RDFs and conservation measures are similar to Alternative B. Possible cancellation or buyout of leases would prevent future development of existing oil and gas leases in those areas.

#### 4.6.7 Alternative D

##### ***Impacts from Fluid Minerals (Including Mineral Split Estate)***

Under Alternative D, the BLM would apply the same RDFs to the same acreage as under Alternative B. However, the conservation measures applied would differ. No quantitative percentage limit, surface occupancy buffers, or TL would apply to surface disturbance; rather, surface disturbance would avoid or minimize disturbance to GRSG and their habitat. Operation costs could increase as described under *Nature and Types of Impacts* from application of conservation measures, but operators would be able to extract resources throughout the year and would maintain flexibility in siting options for ancillary facilities on their lease. Unitization would occur on a case-by-case basis in the same manner as described under Alternative A.

In addition to RDFs and limitations on disturbance, noise limitations and structure height restrictions would be applied as COAs under Alternative D. This would require additional standards that could increase time and costs related to development.

Impacts related to geophysical exploration are similar to those under Alternative B.

### 4.7 SOLID LEASABLE MINERALS

#### 4.7.1 Methods and Assumptions

Solid leasable minerals in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area are coal and hardrock minerals underlying acquired lands (see **Section 3.8**).

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

##### ***Indicators***

**Table 4-11**, Comparison of Solid Leasable Minerals Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on solid leasable minerals under each alternative.

**Table 4-11**  
**Comparison of Solid Leasable Minerals Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
The amount of land closed to nonenergy solid mineral leasing	0	279,097	453,969	0
Application of RDFs that can be placed on solid minerals	No change	Increase	Increase	Increase

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

In areas that are acceptable or available for solid mineral leasing, factors that affect solid leasable mineral extraction include permitting, regulatory policy, public perception and concerns, travel management, transportation, proximity to sensitive areas, low commodity prices, taxes, and housing and other necessities for workers.

The amount of area that would fall under restrictions outlined in **Chapter 2**, and the impact of those restrictions on solid leasable mineral development, are considered below in the analysis of each alternative.

### **Assumptions**

The analysis includes the following assumptions:

- There are no existing coal leases in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area and no known coal potential in GRSG habitat.
- If an area is leased, it could be developed; however, not all leases would be developed within the life of this RMPA.
- As demand for energy increases, so would the demand for energy resources.
- Management actions and conservation measures also apply to solid mineral leasing on lands overlying federal solid mineral estate, which includes federal mineral estate underlying BLM-administered lands, privately owned lands, and state-owned lands. There are 453,969 acres of federal solid mineral estate within the decision area (345,560 acres of BLM-administered surface with federal solid minerals and 108,409 acres of non-BLM administered surface with federal solid minerals).

#### 4.7.2 Nature and Type of Effects

As discussed in **Section 3.8** there has been no coal development within the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area, and there is no known coal development potential within GRSG habitat. As a result, coal resources in the planning area are not expected to be impacted by management actions proposed in this RMPA and are not discussed further in this section.

Management actions that close areas to nonenergy solid mineral leasing would directly impact nonenergy solid leasable minerals by reducing the area available for leasing. If the most lucrative resources were closed to leasing, prospectors may have to prospect and extract resources that are not as lucrative, thus decreasing profit. Prospecting and extraction operations may also move to nearby private minerals within GRSG habitat, where the BLM could not impose measures to protect GRSG.

Application of RDFs would increase the cost of nonenergy solid leasable mineral development if it resulted in increased reclamation and mitigation expense, siting operations in less economical locations, or delays of operations.

Implementing management for the following resources would have negligible or no impact on solid leasable minerals and are therefore not discussed in detail: travel and transportation management, recreation, lands and realty, range management, fluid minerals, mineral split estate, fire and fuels management, habitat restoration and vegetation management, and ACECs.

#### 4.7.3 Alternative A

##### ***Impacts from Solid Minerals***

Approximately 2,538 acres (less than one percent) of the federal solid mineral estate would remain closed to solid minerals, precluding future leasing in these areas. The types of impacts from these closures are the same as those discussed under the *Nature and Type of Effects*, reducing the area available to leasing and extraction.

Under Alternative A, prospecting permits would continue to be issued within the decision area on a case-by-case basis. Site-specific environmental review would continue to assess impacts and develop mitigating measures, which could result in increased restrictions.

#### 4.7.4 Alternative B

##### ***Impacts from Solid Minerals***

Under Alternative B, all PH (279,097 acres, or 61 percent of the solid minerals decision area) would be closed to nonenergy solid mineral leasing. Once current prospecting permits expired, they would not be able to be renewed. Current prospecting permits could not lead to lease issuance. This would close all areas where nonenergy solid mineral prospecting has occurred within the planning

area in the past 20 years. Impacts on the nonenergy solid minerals program would increase compared with those under Alternative A and would be the same type as described under *Nature and Type of Effects*, reducing the area available to leasing and extraction.

RDFs outlined in **Appendix C** would apply to existing nonenergy solid mineral leases in PH. These RDFs would place limitations on road design, construction, and use; would restrict operations to minimize surface disturbance; would limit construction; would maximize reclamation efforts to meet GRSG habitat needs; and would place other standards and restrictions on solid mineral operations. Impacts would be the same type as those discussed under *Nature and Type of Effects* and could increase extraction costs

#### **4.7.5 Alternative C**

##### ***Impacts from Solid Minerals***

Impacts under Alternative C are similar to those under Alternative B, except that more acres (453,969 acres, or 100 percent of the solid minerals decision area) would be closed to nonenergy solid mineral leasing. Also, more acres with existing leases would be subject to the mandatory application of the solid mineral RDFs outlined in **Appendix C**. Impacts would increase compared with those under Alternative A and would be the same type as described under *Nature and Type of Effects*. This includes fewer areas available for leasing and extraction and other standards and restrictions on solid mineral operations; these could also increase costs.

#### **4.7.6 Alternative D**

##### ***Impacts from Solid Minerals***

Management of solid leasable minerals under Alternative D would be similar to that under Alternative A except that, under Alternative D, new prospecting permits would be subject to the RDFs outlined in **Appendix D**. These RDFs would place limitations on surface disturbing activities and human presence, require mitigation actions for habitat losses, limit siting options for facilities, and place other standards and restrictions on solid mineral operations. Impacts and costs would increase compared with those under Alternative A and would be the same type as described under *Nature and Type of Effects*.

### **4.8 SOLID MINERALS (LOCATABLE MINERALS)**

#### **4.8.1 Methods and Assumptions**

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

direct or indirect impacts on locatable minerals are described under *Indicators*, below.

### **Indicators**

**Table 4-12**, Comparison of Solid Minerals (Locatables) Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on locatable minerals under each alternative.

**Table 4-12**  
**Comparison of Solid Minerals (Locatables) Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
The amount of land <i>withdrawn</i> from locatable mineral entry	2,538	2,538	2,538	2,538
The amount of land <i>recommended for withdrawal</i>	0	279,097	453,969	0
Application of restrictions, such as BMPs and conservation measures, that can be placed on locatable mineral development activities to prevent unnecessary or undue degradation of GRSG habitat	No change	Increase	Increase	Increase

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

In areas that are open to locatable mineral entry, factors that affect locatable mineral extraction include permitting, regulatory policy, public perception and concerns, travel management, transportation, proximity to sensitive areas, low commodity prices, taxes, and housing and other necessities for workers.

The amount of area that would fall under restrictions outlined in **Chapter 2**, and the impact of those restrictions on locatable mineral development, are considered below in the analysis of each alternative.

### **Assumptions**

The analysis includes the following assumptions:

- There is no known locatable mineral potential within occupied habitat in the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area.
- Management actions and conservation measures also apply to locatable mineral development on lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-

administered lands, privately owned lands, and state-owned lands. There are 453,969 acres of federal solid mineral estate within the decision area (345,560 acres of BLM-administered surface with federal minerals and 108,409 acres of surface with federal solid minerals not administered by the BLM).

#### **4.8.2 Nature and Type of Effects**

As discussed in **Section 3.9** no locatable mineral development potential has been identified within GRSG habitat in the current RMPs (BLM 1992, Appendix C [as amended]). As a result, locatable minerals in the planning area are not expected to be impacted by management actions proposed in this RMPA.

Withdrawal or closure of an area to mining development removes the mineral resources in that area from being able to be accessed and extracted. This represents an impact on the potential discovery, development, and use of those resources by decreasing the availability of mineral resources. Because there is no known locatable mineral development potential in GRSG habitat, withdrawing lands is not expected to impact the locatable minerals program.

Implementing management for the following resources would have negligible or no impact on locatable minerals and are therefore not discussed in detail: travel and transportation management, recreation, lands and realty, range management, fluid minerals, mineral split estate, fire and fuels management, habitat restoration and vegetation management, and ACECs.

#### **4.8.3 Alternative A**

##### ***Impacts from Solid Minerals***

Under Alternative A, approximately 2,538 acres (less than one-percent of the total federal solid mineral estate for locatable minerals) would remain withdrawn to the location of mining claims. Impacts would be the same as those discussed under *Nature and Type of Effects*, whereas new exploration and mining would be precluded in these areas.

Under Alternative A, prospecting permits would continue to be issued within the decision area on a case-by-case basis. Site-specific environmental review would continue to assess impacts and develop mitigating measures.

#### **4.8.4 Alternative B**

##### ***Impacts from Solid Minerals***

Under Alternative B, approximately 101 acres of PH and 2,437 acres of the GH (2,538 acres total, same as Alternative A) would remain withdrawn to locatable mineral entry, precluding new exploration and mining. Impacts would be the same as those discussed under *Nature and Type of Effects*, whereas new exploration and mining would be precluded in these areas.

To restrict locatable mineral development, the BLM must petition the Secretary of the Interior for withdrawal actions, with subsequent valid existing rights reviews for existing claims. Under Alternative B, 279,097 acres of PH would be recommended for withdrawal. As discussed under *Nature and Type of Effects*, there is no known locatable mineral potential in GRSG habitat, so no effect on locatable minerals is anticipated.

In accordance with the FLPMA, it is the BLM's responsibility to prevent "unnecessary or undue degradation of the lands." In addition to performance standards (described under Alternative A), BLM may apply BMPs (per **Appendix C**) and conservation measures outlined in **Chapter 2 (Table 2-4)** to any Notice or Plan of Operations on a case-by-case basis. Application of these requirements would impact locatable mineral development by increasing its costs if it resulted in the application of additional requirements (e.g., GRSG-safe fences around sumps) and/or use of more expensive technology (e.g. burying power lines) than would otherwise have been used by operators.

#### **4.8.5 Alternative C**

##### ***Impacts from Solid Minerals***

Under Alternative C, approximately 101 acres of the PH and 2,437 acres of the GH (2,538 acres total, same as Alternative A) would remain withdrawn to locatable mineral entry, precluding new exploration and mining. Impacts would be the same as those discussed under *Nature and Type of Effects*, whereas new exploration and mining would be precluded in these areas.

To restrict locatable mineral development, the BLM must petition the Secretary of the Interior for withdrawal actions, with subsequent valid existing rights reviews for existing claims. Under Alternative C, 453,969 acres of PH and GH would be recommended for withdrawal. As discussed under *Nature and Type of Effects*, there is no known locatable mineral potential in GRSG habitat so no effect on locatable minerals is anticipated.

Applying BMPs and conservation measures to any Notice or Plan of Operations would result in the same types of impacts as those described under Alternative B; however, these measures would apply to more acres under Alternative C.

#### **4.8.6 Alternative D**

##### ***Impacts from Solid Minerals***

Under Alternative D, approximately 101 acres of the PH and 2,437 acres of the GH (2,538 acres total, same as Alternative A) would remain withdrawn to the location of mining claims, precluding new exploration and mining. Impacts would be the same as those discussed under *Nature and Type of Effects*, whereas new exploration and mining would be precluded in these areas.

Similar to Alternative A, no additional lands within PH or GH would be recommended for withdrawal.

Applying BMPs and conservation measures to any Notice or Plan of Operations would result in the same impacts as those described under Alternative B (see **Appendix D**).

## 4.9 SOLID MINERALS (SALABLE MINERALS)

### 4.9.1 Methods and Assumptions

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

#### *Indicators*

**Table 4-13**, Comparison of Solid Minerals (Salable Minerals) Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on salable minerals under each alternative.

**Table 4-13**  
**Comparison of Solid Minerals (Salable Minerals) Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Acres closed to salable mineral disposal	2,538	279,097	453,969	2,538
Acres managed as ROW avoidance areas	9,708	112,341	0	240,464
Acres managed as ROW exclusion areas	0	233,219	345,560	0
Application RDFs that can be placed on salable minerals	No change	No change	No change	Increase
Restrictions on salable mineral pits no longer in use	No change	Increase	Increase	Increase

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

In areas that are open to salable mineral disposal, factors that affect salable mineral development include permitting, regulatory policy, public perception and

concerns, travel management, transportation, proximity to sensitive areas, low commodity prices, taxes, and housing and other necessities for workers.

The amount of area that would fall under restrictions outlined in **Chapter 2**, and the impact of those restrictions on salable mineral development, are considered below in the analysis of each alternative.

### **Assumptions**

The analysis includes the following assumptions:

- Existing salable mineral permits would not be affected by the closures proposed under this RMPA.
- Management actions also apply to salable mineral development on lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered lands and land not administered by the BLM. There are 453,969 acres of federal mineral estate within the decision area (345,560 acres of BLM-administered surface with federal minerals and 108,409 acres of split estate).

#### **4.9.2 Nature and Type of Effects**

The predominant mining method for salable minerals is surface mining; therefore, any restrictions on surface-disturbing activities effectively close the subject areas to salable mineral mining.

Demand for salable minerals is generated primarily from road maintenance needs. Closure of areas to salable mineral sales would result in pits relocating nearby. If demand for salable minerals cannot be met by pits operated on federal lands, pits could move onto private lands where the BLM would lose the ability to implement mitigation measures.

Application of RDFs would increase the cost of salable mineral development if it were to increase reclamation and mitigation expense, site pits in less economical locations, or delay operations.

Requiring reclamation of salable mineral pits no longer in use could increase costs on developers if the BLM requires them to pay for the reclamation.

Managing areas as ROW avoidance or exclusion could result in impacts on salable minerals because construction of new roads in these areas would likely decrease. As a result, demand for salable minerals needed for construction and maintenance would also decrease.

Implementing management for the following resources would have negligible or no impact on salable minerals and are therefore not discussed in detail: travel and transportation management, recreation, range management, fluid minerals, mineral split estate, fire and fuels management, habitat restoration and vegetation management, and ACECs.

#### 4.9.3 Alternative A

##### ***Impacts from Lands and Realty***

Under Alternative A, 9,708 acres would continue to be managed as ROW avoidance area. All other BLM-administered surface in the decision area would continue to be open to ROW authorization. The types of impacts from these closures would be the same as those discussed under *Nature and Type of Effects*, whereas construction of new roads in these areas would likely decrease thereby decreasing demand for salable minerals needed for construction and maintenance.

##### ***Impacts from Solid Minerals***

Approximately 2,538 acres (less than one percent) of the federal solid mineral estate in the decision area would remain closed to the salable minerals disposal, precluding future mining in these areas. The types of impacts from these closures would be the same as those discussed under *Nature and Type of Effects*, reducing the area available for access and extraction.

#### 4.9.4 Alternative B

##### ***Impacts from Lands and Realty***

Under Alternative B, 112,341 acres would be managed as ROW avoidance area and 233,219 acres would be managed as ROW exclusion area. The types of impacts from these closures would be the same as those discussed under *Nature and Type of Effects*, whereas construction of new roads in these areas would likely decrease thereby decreasing demand for salable minerals needed for construction and maintenance.

##### ***Impacts from Solid Minerals***

Under Alternative B, approximately 279,097 acres of federal mineral estate in PH (61 percent of the solid minerals decision area) would be closed to the salable mineral disposal. The types of impacts from these closures would be the same as those discussed under *Nature and Type of Effects*, reducing the area available for access and extraction. If demand for salable minerals cannot be met by pits operated on BLM-administered lands, pits could move onto private lands where the BLM would lose the ability to implement mitigation measures.

Solid mineral RDFs outlined in **Appendix C** would apply to existing salable mineral operations in PH. These RDFs would limit road design, construction, and use; would restrict operations to minimize surface disturbance; would limit construction; would maximize reclamation to meet GRSG habitat needs; and would place other standards and restrictions on salable mineral operations. Impacts would be the same type as those discussed under *Nature and Type of Effects*.

In PH, salable mineral pits no longer in use would be restored to meet GRSG habitat conservation objectives. As described under *Nature and Type of Effects*,

restoring pits would increase costs on developers if the BLM requires them to pay for the reclamation.

#### **4.9.5 Alternative C**

##### ***Impacts from Lands and Realty***

Approximately 345,560 acres in PH and GH (100 percent of BLM-administered surface in the decision area) would be managed as ROW exclusion areas under Alternative C. However, because all PH and GH would be closed to salable minerals disposal under this alternative, the ROW exclusion areas would not impact the salable minerals program.

##### ***Impacts from Solid Minerals***

Under Alternative C, approximately 453,969 acres of federal mineral estate in PH and GH (100 percent of the solid minerals decision area) would be closed to salable mineral disposal, the most of any alternative. The types of impacts from these closures would be the same as those discussed under *Nature and Type of Effects*, reducing the area available for access and extraction.

Similar to Alternative B, RDFs outlined in **Appendix C** would be applied to salable mineral operations in PH. Because more acres would be within PH and GH under Alternative C, the impacts of applying these RDFs would increase.

Similar to Alternative B, salable mineral pits no longer in use would be restored to meet GRS habitat conservation objectives; however, under this alternative this measure would apply to both PH and GH, thereby increasing the area of impact. The types of impacts from restoring pits no longer in use would be the same as those described under Alternative B; however, they may be greater because of larger area.

#### **4.9.6 Alternative D**

##### ***Impacts from Lands and Realty***

Under Alternative D, 240,464 acres in PH (70 percent of BLM-administered surface in the decision area) would be managed as an ROW avoidance area. The types of impacts from these closures would be the same as those discussed under *Nature and Type of Effects*, whereas construction of new roads in these areas would likely decrease thereby decreasing demand for salable minerals needed for construction and maintenance.

##### ***Impacts from Solid Minerals***

Management under Alternative D would be similar to that under Alternative A except that RDFs outlined in **Appendix D** would be applied to new salable mineral operations. These RDFs would limit surface disturbance and human presence, require mitigation actions for habitat losses, limit siting options for facilities, and place other standards and restrictions on salable mineral

operations. Impacts would increase compared with Alternative A and would be the same type as those described under *Nature and Type of Effects*.

Similar to Alternative B, salable mineral pits no longer in use would be restored to meet GRSG habitat conservation objectives. The types of impacts from restoring pits no longer in use would be the same as those described under *Nature and Type of Effects*, restoring pits would increase costs on developers if the BLM requires them to pay for the reclamation.

## 4.10 COMPREHENSIVE TRAVEL AND TRANSPORTATION MANAGEMENT

### 4.10.1 Methods and Assumptions

Travel allocations and designations support resource programs and are designed to help achieve their objectives. Therefore, CTTM is not considered to be in conflict with those resource programs. Impacts on travel and transportation from other resource areas include altering the existing transportation system, for instance by removing routes (i.e., reclaiming and revegetating the ROW) or by limiting or closing routes to certain modes of travel (such as designating routes as closed to motorized travel).

Where a route closure would protect wildlife habitat, the impacts of the route closure (i.e., improved wildlife habitat) are to the wildlife resource program, not travel and transportation management. As a result, impacts of travel allocations on other resources and resource uses are discussed in the respective resource sections of this chapter. Therefore, while impacts on travel and transportation management from other program areas do occur and are considered as part of travel management planning, this section does not address the impacts on travel and transportation management from other resources and resource uses.

#### *Indicators*

**Table 4-14**, Comparison of Comprehensive Travel and Transportation Management Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on travel and transportation management under each alternative.

**Table 4-14**  
**Comparison of Comprehensive Travel and Transportation Management**  
**Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Change in the types of transportation activities occurring on routes that may impact GRSG or habitat	No change	No change	No change	No change
Change of designated motorized wheeled routes (such as from limited to closed)	No change	No change	No change	No change

**Table 4-14**  
**Comparison of Comprehensive Travel and Transportation Management**  
**Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Number of acres where new road development would be allowed	No change	No change, with mitigation	Decrease 274,435 acres	No change, with mitigation

### **Assumptions**

The analysis includes the following assumptions:

- In the Lewistown Field Office Greater Sage-Grouse RMPA/EIS planning area (233,219 acres of PH and 112,341 acres of GH), OHV travel is, and will continue to be limited to existing routes until the BLM is able to complete site-specific travel management planning.
- The demand to increase and maintain travel routes on BLM-administered lands would continue to increase over 20 years, especially near communities and in areas of high-density oil and gas development.
- The BLM has no authority over federal, state, or county roads on BLM-administered lands, so those routes are not included in the analysis.
- The travel designations would not affect ROW holders, permitted uses, county or state roads, or other valid existing rights. Travel closures/limitations apply only to public access.
- The incidence of resource damage would increase with the increasing use of BLM-administered lands.
- Administrative use authorizations are granted on a case-by-case basis with approval from the BLM.
- Implementation of a travel management plan would include increased public education, signing, enforcement, and resource monitoring in regard to travel management.

#### **4.10.2 Nature and Type of Effects**

Impacts on travel and transportation management are those that restrict or enhance travel (e.g., managing areas as closed or limited to motorized travel and seasonal travel limitations). Current BLM management limits motorized travel to existing roads and trails within the planning area. New travel and transportation management actions in response to GRSG habitat protection strategies could limit travel route miles and the types of activities allowed on those routes. Seasonal travel restrictions to prevent disruption of GRSG breeding and brood

rearing activities would allow travel in defined areas only at specific times of the year. Additionally, management actions that restrict future route construction limit the ability of the travel network to accommodate increased travel demands over time. Conflicts among route users could increase if the existing network becomes congested.

CTTM decisions resulting in the closure or removal of routes in GRSG habitat areas would affect travel and transportation management throughout the entire planning area. Management for all other resources and uses would have negligible or no impact on CTTM and are therefore not discussed in detail.

#### 4.10.3 Alternative A

**Table 4-15**, Areas Open/Closed to New Road Construction by Alternative, provides a comparison of acres open and closed to new road construction by alternative. Closed acres are based on the total area covered by four-mile buffers placed around active lek sites.

**Table 4-15**  
**Areas Open/Closed to New Road Construction by Alternative**

	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Area open to new construction (acres)	345,560	345,560	71,125	345,560
Area closed to new construction (acres)	0	0	274,435	0

#### ***Impacts from Travel and Transportation Management***

Under Alternative A, existing travel opportunities would be maintained. The BLM would continue to manage for a total of 695 miles of roads and trails throughout the decision area. Through site-specific planning, the BLM would designate roads and trails for motorized use. Roads and trails would be inventoried, mapped, and analyzed to the degree necessary to evaluate and designate the roads and trails as open, seasonally open, or closed. Until such time, motorized wheeled travel would continue to be limited yearlong to existing roads and trails and no areas would be entirely open to cross-country motorized wheeled travel or entirely closed, resulting in continued existing impacts, as described above in the *Nature and Types of Effects*, into the foreseeable future.

#### 4.10.4 Alternative B

#### ***Impacts from Travel and Transportation Management***

Alternative B could result in more restrictions on existing travel and transportation opportunities than Alternative A. For areas within PH, the BLM would develop a travel and transportation management plan within five years of the RMP ROD. The new plan would be used to evaluate the existing

transportation network and as a basis for amending certain route designations. Access in PH could be diminished if the new plan closes or restricts travel on certain routes. Alternative B would also prohibit new route construction unless associated with valid existing rights and would preclude upgrading of existing routes in PH where such action would result in loss of GRSG habitat. This would limit future enhancements to travel opportunities.

#### **4.10.5 Alternative C**

##### ***Impacts from Travel and Transportation Management***

Under Alternative C, the BLM would develop a travel and transportation plan for areas in PH and GH within five years of the RMP ROD. The four-mile lek buffers cover 274,435 acres (79 percent of the decision area). As a result, new road construction would be limited to 71,125 acres in the decision area. BLM management would also preclude upgrading of existing routes in PH and GH where such action would damage GRSG habitat. These actions would result in site-specific losses of opportunity for route construction and improved access. They would prevent the construction of new roads where they might otherwise be needed to improve access or functionality of the network.

#### **4.10.6 Alternative D**

##### ***Impacts from Travel and Transportation Management***

Under Alternative D, the BLM would continue to limit travel to existing roads and trails on 345,560 acres. The BLM would prepare a travel and transportation management plan to address all resource uses that would be completed within five years of the signing of the ROD for the RMP. This plan would allow for subsequent route evaluation and designation of roads and trails. It would look at a range of alternatives for specific route designations to minimize impacts on GRSG habitat. During route designation and travel planning in PH, CTTM would evaluate the need for permanent or seasonal road or area closures where OHV use is causing or would cause considerable adverse effects upon habitat. Road reclamation would be determined on a case-by-case basis depending on whether the route provides specific benefits for public access and the route minimizes impacts on resources.

In PH, during site specific travel and transportation management planning, the BLM would limit route construction to realignments of existing 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. All upgrades to existing routes would be evaluated on a case-by-case basis and would be subject to valid existing rights. If valid existing rights cannot be accessed via existing roads, then any new road construction would be built to absolute minimum standard necessary. When reseeding roads, primitive roads and trails in PH, appropriate seed mixtures would be used and transplanting sagebrush would be considered. In PH, restoration of roads, primitive roads and trails would be

conducted if they are not designated in the future travel management plans. Alternative D would minimize impacts on travel and transportation management, while providing mitigation options for the protection of GRSG habitat.

## 4.11 RECREATION

### 4.11.1 Methods and Assumptions

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

#### *Indicators*

**Table 4-16**, Comparison of Recreation Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on recreation under each alternative.

**Table 4-16**  
**Comparison of Recreation Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Change in recreation activities and participation rates in the planning and PH areas, especially those within SRMA and ERMA	No change	Opportunity for increase due to restrictions on surface disturbance	Greatest opportunity for increase in nonmechanized activities and greatest opportunity for decrease of motorized activities due to restrictions on surface disturbance	Opportunity for increase due to restrictions on surface disturbance
Change in the number and type of SRPs issued on an annual basis within the planning area and PH	No change	Decrease in SRPs that are not beneficial or neutral	Decrease in SRPs that are not beneficial or neutral	Decrease in SRPs that are not beneficial or neutral
Access	No change	Opportunity for a slight decrease in motorized access	Decrease in motorized access due to a decrease in roads	Opportunity for a slight decrease in motorized access

**Assumptions**

The analysis includes the following assumptions:

- Traditional recreational uses in the planning area, such as hunting and fishing, would continue as people seek outdoor family-oriented activities; an active retired population spends its disposable time and income on recreation; and as other areas of the country become more urbanized.
- The LFO would continue to manage the Judith River SRMA and 13 ERMA's in accordance with existing policies but with management constraints, particularly in the Judith River SRMA, due to non-contiguous land holdings.
- Outdoor recreation would continue to be an important component of the local economy.
- Substantial increases in recreation could negatively impact GRSG habitat.
- The potential for resource impacts and conflicts between all types of users would increase with increasing use.
- Demand for SRPs would remain steady or gradually increase over time.
- The BLM would continue to issue SRPs on a discretionary basis.

**4.11.2 Nature and Type of Effects**

Impacts on recreation are frequently the result of management actions related to other resources and resource uses (for example, special status species habitat protection) and stipulations placed on resource uses. New management actions to preserve GRSG habitat would affect a variety of resources and uses, which would in turn affect recreation.

BLM management of areas as unsuitable for public utilities (i.e., ROW exclusion areas) protects recreation opportunities. Depending on location, development in utility corridors impacts recreation opportunities during construction and operation. Managing areas as ROW avoidance can limit development that would be incompatible with nearby recreation uses.

On lands with existing oil and gas leases and facilities, the recreation setting would be altered during construction by equipment, noise, dust, vehicles, night lighting, pipelines, and human activity. Fluid mineral development that requires surface occupancy generally impacts recreation management objectives, opportunities, and activities. Even with controlled surface use stipulations, oil and gas development can impact recreation opportunities if the development conflicts with existing recreation activities. However, applying NSO stipulations preserves the natural character of landscapes and protects GRSG habitat.

Stipulations maintain current recreation settings and preserve recreation opportunities in those areas in the long term.

Minerals development and disposal result in short- and long-term impacts during construction and operations by displacing recreation opportunities. Closure of certain areas to mineral development decreases the likelihood for conflict with recreation users and maintains desired recreation settings.

Travel management affects recreation opportunities and the overall recreation experience by managing for access to areas where recreation activities take place. Closure of routes to motorized travel can decrease access to recreation uses, while at the same time reducing conflicts between motorized and non-motorized recreation activities. Travel and transportation management policies that close routes to OHV use directly affect recreation opportunities in the closed area and can increase OHV impacts outside the closure boundary. Management actions that restrict future route construction limit the ability of the travel network to accommodate increased recreational demands, such as increased OHV use, over time. Conflicts among users could increase if the existing network becomes congested.

Where lands are open to livestock grazing, impacts on recreation can result. The intensity of the impact varies based on recreation activity, visitor expectation, and nature of the grazing activity. Range improvements help to reduce conflicts by keeping grazing animals away from popular recreation areas, particularly SRMAs and ERMAs. Structural range improvements may also hinder cross-country movement by hunters, bird watchers, hikers, and other recreationalists.

Development of renewable energy projects, such as wind, could result in the loss of recreation opportunities. Management of certain areas as ROW avoidance areas can minimize impacts from renewable energy projects.

BLM management for ACECs often includes restrictions on surface-disturbing activities within the ACEC boundary, which could directly or indirectly affect recreation opportunities within an ACEC. At the same time, management prescriptions for ACECs can help maintain the existing physical setting by preserving natural landscapes.

Implementing management for certain resources would have negligible or no impact on recreation and are therefore not discussed in detail. Resources not likely to have an effect on recreation include fire and fuels management, and habitat restoration and vegetation management. Impacts from mineral split estate are covered under the discussions of impacts from fluid and solid minerals. As such, there is no further discussion of mineral split estate in this section.

#### 4.11.3 Impacts Common to All Alternatives

##### ***Impacts from Lands and Realty***

Under all alternatives, impacts on recreation opportunities from existing ROWs would continue. The restoration of discontinued or abandoned ROWs pursuant to FLPMA guidelines would reduce the potential for long-term impacts. Particularly in situations where the ROW includes a linear obstruction such as a fence; removal of the feature could improve recreation user experiences.

##### ***Impacts from Solid Minerals***

Although BLM management prescriptions under the alternatives would vary, there is no foreseeable solid leasable (coal) or locatable mineral potential in the decision area which would result in no impacts on recreation across all alternatives.

#### 4.11.4 Alternative A

##### ***Impacts from Travel and Transportation Management***

Under Alternative A, through site-specific planning, the BLM would designate roads and trails for motorized use. Roads and trails would be inventoried, mapped, and analyzed to the degree necessary to evaluate and designate the roads and trails as open, seasonally open, or closed. As a result, the potential for conflicts among different types of recreation users, such as hikers and OHV operators, would continue under Alternative A.

##### ***Impacts from Recreation***

BLM management under Alternative A would result in no additional measures to protect GRS habitat. No new impacts from BLM management actions to recreation would occur.

##### ***Impacts from Lands and Realty***

Under Alternative A, 215 total miles of existing ROWs, including roads, telephone and power lines, pipelines, and railroads, would continue to impact recreation opportunities. A total of 9,708 acres associated with the Acid Shale-Pine Forest ACEC and Judith River Canyon would continue to be managed as ROW avoidance areas, concurrently protecting existing recreation opportunities in those areas.

BLM-administered lands would continue to be available for ROWs on a case-by-case basis, in accordance with Title V of FLPMA and 43 CFR, Part 2800. All ROW applications would be reviewed using the criteria of following existing corridors wherever practical and avoiding the proliferation of separate ROWs. Recreational opportunities could be diminished where new ROWs are authorized.

Renewable energy projects, such as wind facilities, would be authorized through the ROW authorization process. See **Section 4.20** for impact analysis regarding renewable energy development.

#### ***Impacts from Range Management***

Under Alternative A, PH and GH would continue to be open to grazing. Impacts on recreationists would be consistent with the *Nature and Types of Effects*, especially where cattle grazing areas overlap prime big game hunting areas. Impacts of grazing on SRPs would continue to be evaluated on a case-by-case basis through the SRP issuance process.

#### ***Impacts from Fluid Minerals***

Under Alternative A, oil and gas development would continue to impact recreational opportunities on 8,120 leased acres throughout the decision area, including 3,851 acres in PGH and 2,786 acres in PGH. Refer to *Nature and Types of Effects*, above for the nature of impacts on recreation from fluid mineral development. Impacts on recreationists include activities and disturbance related to exploration, development, and operations.

#### ***Impacts from Solid Minerals***

There are three existing sand and gravel pits in the decision area, each less than five acres in size. Under Alternative A, salable material disposal is expected to continue to have no impact on SRPs because the sand and gravel pits do not conflict with areas or activities currently experiencing demand for SRPs.

#### ***Impacts from ACECs***

Under Alternative A, the Acid Shale-Pine Forest ACEC would continue to provide a rural, undeveloped experience for popular recreation activities such as hunting, OHV use, hiking, birding, and nature photography.

### **4.11.5 Alternative B**

#### ***Impacts from Travel and Transportation Management***

BLM would evaluate the need for permanent or seasonal road closures under Alternative B. Should the BLM determine there is a need to close certain routes those closures could restrict route-based recreation opportunities. Areas where routes would be closed could include areas where permitted recreation activities take place.

Under Alternative B, the BLM would only allow new roads where access to valid existing rights is necessary and does not currently exist. While new roads could improve certain recreation experiences such as OHV operation, actions proposed under Alternative B would reduce the potential for new conflicts between motorized travel and existing recreation uses that do not require motorized vehicle operation.

***Impacts from Recreation***

Under Alternative B, the BLM would consider the effects of SRPs on PH. Impacts on the number or types of SRPs would only occur if the BLM determines that a proposed SRP activity negatively affects PH. If SRPs are reduced, there would be a corresponding reduction in organized recreation opportunities on BLM-administered lands in the planning area. Because BLM has not identified a conflict between hunting and PH, this alternative is anticipated to have little or no impact on big game or upland bird hunting SRPs. Only SRPs that are neutral or beneficial on PH would be allowed.

***Impacts from Lands and Realty***

Under Alternative B, PH would be designated as ROW exclusion area and GH would be designated ROW avoidance area. Additionally, under Alternative B, the BLM would take advantage of opportunities to remove, bury, or modify existing power lines within PH areas. A long-term reduction in the amount of acres dedicated to ROWs and above-ground linear features, such as transmission lines and pipelines, would improve recreation opportunities as described under *Nature and Types of Effects*, potentially limiting development that would be incompatible with nearby recreation uses.

***Impacts from Range Management***

Impacts under Alternative B would be the same as those described above under Alternative A.

***Impacts from Fluid Minerals***

Restrictions such as TLs on fluid mineral development in PH under Alternative B would decrease the potential for oil and gas development conflicting with recreation users. The benefits of reduced surface disturbance and less construction activity associated with oil and gas development would be consistent with the effects described under *Nature and Types of Effects*. Restriction of geophysical exploration to helicopter-portable drilling methods could diminish the quality of certain recreation activities, such as hunting, if helicopter operations are in proximity to key big game or bird hunting areas or existing SRMAs and ERMAs.

***Impacts from Solid Minerals***

Proposed BLM management actions for Alternative B would include the closure of all PH areas to salable mineral disposal. In addition, mineral pits no longer in use would be restored. Since there are only three small sand and gravel pit operations in the decision area, a reduction in salable mineral disposal would have a neutral effect or slightly enhance recreation opportunities by minimizing salable material extraction and hauling activities that have the potential to conflict with hunting, fishing, birding, camping, and other recreational activities. A change in the amount of salable material disposal under Alternative B would have a neutral effect on SRPs.

***Impacts from ACECs***

Impacts on recreation under Alternative B for ACECs are the similar to those described under Alternative A. In addition to management actions under Alternative A, Alternative B would include conservation measures consistent with the identified management actions and constraints identified for PH. This would provide additional opportunities for an undeveloped experience for popular recreation activities, such as hunting, OHV riding, hiking, birding, and photographing nature.

**4.11.6 Alternative C*****Impacts from Travel and Transportation Management***

Impacts under Alternative C would the same as those described above under Alternative B, with the exception that Alternative C would include additional prohibitions on new road construction within four miles of active leks. Under this alternative, new roads would be allowed on 71,125 acres (21 percent) of the lands within the decision area. Limitations on new construction would limit motorized recreation access to existing roads and trails with resultant impacts consistent with those described under *Nature and Types of Effects*.

***Impacts from Recreation***

BLM management prescriptions under Alternative C for GRSG habitat protection would not directly affect the permitting criteria for SRPs. Direct and indirect impacts on recreation under Alternative C would result from new management actions for other resources and uses, particularly the designation of 96,246 acres as an ACEC to protect GRSG habitat (see *Impacts from ACECs*, below).

***Impacts from Lands and Realty***

Under Alternative C, all GRSG habitat, with the exception of 843 acres of unitized areas, would be designated as ROW exclusion area for new ROW authorizations. Any new development would be allowed only if it could be contained within an existing ROW. Consistent with the impacts described under *Nature and Types of Effects*, the designation of the decision area as ROW exclusion area would benefit recreation uses. ROW exclusion area designations would also protect the desired settings in the Judith Valley SRMA and the 11 ERMA.

***Impacts from Range Management***

Under Alternative C, 337,165 acres in PH and GH would be closed to grazing. As such, the potential for conflicts with recreationists would be reduced in those areas. Alternative C could also remove range improvements and prevent the construction of new water developments, which would further minimize potential conflicts with recreationists. However, additional fencing to keep livestock in designated non-GRSG habitat areas could conflict with certain recreation activities, such as hunting.

***Impacts from Fluid Minerals***

Restrictions on fluid mineral development in PH under Alternative C would decrease the potential for oil and gas development conflicting with recreation users. The benefits of reduced surface disturbance and less construction activity associated with oil and gas development would be consistent with the impacts described under *Nature and Types of Effects* and under Alternative B.

***Impacts from Solid Minerals***

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

***Impacts from ACECs***

Under Alternative C, the BLM would designate 96,246 acres of GRSG habitat as a new ACEC. Designation of the ACEC could affect recreation opportunities by limiting surface disturbing activities within the ACEC boundaries. For example, motorized recreation associated with popular hunting, fishing, camping, and hiking areas could be limited by the designation. The ACEC designation could also limit the number and type of SRPs within the ACEC.

Designation of a new ACEC would at the same time limit ROW development, grazing, and mineral development. Management prescriptions for the ACEC would be to preserve, protect, conserve, restore, and sustain sage-brush populations and the sagebrush ecosystem upon which the GRSG depend. As a result, recreation activities such as hunting, fishing, birding, and nature photography that create little to no surface disturbance and benefit from rural settings would likely be enhanced under Alternative C.

**4.11.7 Alternative D*****Impacts from Travel and Transportation Management***

Under Alternative D, the BLM would complete a CTTM plan within five years of the signing of the ROD for the RMP. The plan would identify existing roads and trails and designate certain roads as open, closed or limited to motorized travel. The BLM would also consider permanently closing certain user-created roads and trails. Closure of certain routes could diminish route-based recreational opportunities, but could also reduce user conflict. Administrative off-road use for BLM personnel and BLM-authorized activities would be allowed. BLM-implemented CTTM would not apply to private or state lands within the LFO.

***Impacts from Recreation***

SRPs in PH may be allowed if they are neutral or beneficial for GRSG habitat. Impacts would be similar to Alternative B. This requirement would limit issuing SRPs for certain activities.

***Impacts from Lands and Realty***

Under Alternative D, PH would be managed as ROW avoidance areas for new ROW authorizations and wind energy projects. ROWs would continue to be allowed in GH. However, wind energy ROWs, would be managed as ROW

avoidance areas in GH. Any new development would be allowed only if it could be contained within an existing ROW. Consistent with the impacts described under *Nature and Types of Effects*, the designation of PH as a ROW avoidance area would benefit recreation activities that take place in undeveloped settings. Limitations on ROW development would also preserve the existing recreation settings in each of the 11 ERMA's in PH.

New ROWs in GH areas could conflict with dispersed recreation uses in those areas. The extent of the effects would be based on the location and type of any new ROW.

#### ***Impacts from Range Management***

Impacts would be the same as those described under Alternative A.

#### ***Impacts from Fluid Minerals***

Under Alternative D, conservation measures would be applied as COAs to existing federal leases. These measures would limit disturbance, noise, and high profile structures that conflict with popular recreation activities in the planning area.

#### ***Impacts from Solid Minerals***

Denying salable mineral disposal applications that cannot provide adequate mitigation to prevent unnecessary or undue degradation would further limit potential conflict with recreational activities in the planning area.

#### ***Impacts from ACECs***

Impacts would be the same as those described under Alternatives A and B.

## **4.12 RANGE MANAGEMENT**

### **4.12.1 Methods and Assumptions**

#### ***Indicators***

**Table 4-17**, Comparison of Range Management Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on range management under each alternative.

**Table 4-17**  
**Comparison of Range Management Indicators by Alternative**

<b>Indicator</b>	<b>Alternative</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Permitted AUMs in GRSG habitat	69,408	69,408	0	69,408
Permitted AUMs in non-GRSG habitat	34,398	34,398	34,398	34,398
Prohibitions to the ability to construct or maintain range improvements and conduct treatments (infrastructure and vegetation)	No change	Increase	Increase	Increase

**Table 4-17**  
**Comparison of Range Management Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Acres closed to livestock grazing	0	0	337,165	0
Acres open to livestock grazing in GRS habitat	337,165	337,165	0	337,165
Acres open to livestock grazing in non-GRSG habitat	248,435	248,435	248,435	248,435
Changes to timing, duration or frequency of permitted use	No change	Potential increase	Increase	Potential increase

### **Assumptions**

The analysis includes the following assumptions:

- All new and existing leases and permits would be subject to terms and conditions determined by the authorizing officer to achieve the management and resource condition objectives for BLM-administered lands and to meet range land health standards, in accordance with BLM grazing regulations.
- Range improvements (e.g., fences, pipeline, water wells, troughs, and reservoirs) could result in a localized loss of vegetation cover throughout the improvements' useful life. Vegetation would be reestablished through reclamation practices along water pipelines within five years to the extent possible, whereas areas with fences, water wells, troughs, and reservoirs could contain a portion of the area disturbed during their useful life and would be revegetated when abandoned.
- The construction and maintenance of range improvements would continue in the decision area as needed. New range improvements could be subject to limitations, as defined in the plan. Range improvements lead to better livestock distribution and management, which would maintain or improve rangeland health and could benefit the forage base.
- Livestock grazing is a "diffuse" form of biotic disturbance that exerts repeated pressure over many years on a system; unlike point sources of disturbance such as fires, livestock grazing exerts repeated pressure across the landscape.
- Vegetation could be treated to allow the current level of AUMs to be maintained.

#### 4.12.2 Nature and Type of Effects

Impacts on livestock grazing are generally the result of activities that affect forage levels, areas open to grazing, the class of livestock, the season of use and timing, the ability to construct range improvements, and human disturbance or harassment of livestock in grazing allotments. Key types of impacts are detailed below.

Protecting GRSG habitat may directly affect livestock grazing if management requires limitations to areas open to grazing or available AUMs, modification of grazing strategies, or changes to season of use, which could result in increased time and cost to leases/permittees. For example, management actions to enhance habitat for GRSG could affect livestock grazing by restricting grazing intensity, retiring permitted grazing uses in some areas, or changing livestock rotation patterns, in order to maintain residual herbaceous cover in sagebrush habitat (NTT 2011).

Management of vegetation resources to benefit GRSG, may, however, indirectly benefit livestock grazing by increasing vegetation productivity and improving forage in the long term, especially in cases where current conditions are not meeting or exceeding land health standards. For example, in allotments with a history of intensive grazing, transitions in the composition of sagebrush communities may have occurred that have reduced cover or forage for GRSG (Cagney et al. 2010) and grazing livestock. However, when grazing management is put into place to promote health and vigor of the herbaceous community for livestock, this would generally result in sufficient herbaceous cover to meet habitat requirements for breeding GRSG, such as those specified by Connelly et al. (2000).

Similarly, vegetation management designed to curb incursion of non-native annual grasses or encroachment of shrubs, could remove forage in the short term. However, these treatments generally enhance rangeland conditions in the longer term (NTT 2011).

Unregimented livestock grazing can have adverse impacts on riparian ecosystems (Armour et. al 1991); therefore, managing riparian habitat can directly impact livestock grazing through excluding livestock at specific sites, increasing herding, adding range improvements (such as cross fences and water gaps), and adjusting season of use and livestock numbers. Managing riparian habitat to maintain PFC would benefit grazing livestock by indirectly providing cleaner and more reliable water sources and more dependable forage availability.

Protecting water quality and watershed health could require changes in livestock management, such as deferring or shortening grazing periods, adding range improvements, excluding grazing from riparian areas, establishing riparian pastures, and increasing livestock herding. In areas requiring exclusion of livestock or other restrictions on livestock management, these limitations could

increase costs to lessees and permittees if changes were to reduce AUMs or result in more livestock movements.

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

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

Limits on construction or use of transportation routes may affect livestock grazing practices. Road construction may cause loss of forage, harassment, and displacement; therefore, reduction of these activities may benefit livestock by reducing disturbances. Closing roads or trails not leading to range improvements would also increase forage availability when the area is rehabilitated or when natural rehabilitation occurs. Administrative cross-country travel would continue to be granted to grazing lessees and permittees to access grazing allotments and range improvement projects. Travel management actions for GRSG protection generally involve increased limitations or restrictions on travel management.

Wildland fire alters sagebrush habitat due to the long time required for sagebrush to regenerate, which may allow for invasion of invasive species (NTT 2011). Wildland fire would remove vegetation and forage over the short term but can result in short-term increases in forage post-fire. Impacts on livestock operations could also occur when BLM guidelines require a rest period following rehabilitation before grazing is reestablished. Changes in wildland fire suppression and fuels management to protect GRSG habitat would have varying effects on livestock grazing. Measures to protect sagebrush habitat might reduce the spread of wildland fire and the associated disruption to livestock. The

management of habitat for GRSG using natural disturbance regimes, such as fire, and using vegetative treatments to accomplish biodiversity objectives to improve plant community resilience, could also benefit livestock grazing in the long term by maintaining a balance of seral stages. In general, selectively thinning woodland species benefits livestock grazing by creating a healthier grass, forb, and shrub community.

Restrictions on ROWs or land transfers may indirectly impact grazing by reducing construction impacts from development of these ROWs (such as dust, displacement and introduction of noxious weeds). In addition, such restrictions can also inhibit the development of water sources for livestock use where power may be required. Lands and realty actions taken to protect GRSG habitat would involve avoiding or excluding ROWs (e.g., for power lines, pipelines, and other structures) or land transfers in PH or GH. However, the areas outside of GRSG habitat to which ROWs are relocated may see an increase in construction-related effects and associated disturbance or displacement of livestock.

Energy and mineral development could impact grazing as follows: During the exploration and testing phase of mineral development, the footprint of disturbance is usually small and localized; therefore, minimal acres available for grazing would be directly impacted. However, during the exploration phase impacts on livestock dispersal and trespass could occur, increasing time and cost to permittees and lessees. Outside of the exploration and testing phase, surface-disturbing mineral development directly affects areas of grazing in the short term during construction of well pads, roads, pipelines, and other facilities. Potential impacts include changes in available forage, reduced forage palatability because of dust on vegetation, limitations on livestock movement, harassment, temporary displacement of livestock, and an increased potential for the introduction and proliferation of noxious weeds that lack the nutritional value needed for productive grazing practices. In the long term, a smaller amount of grazing acreage is permanently lost from mining operations following rehabilitation. Improving roads associated with mineral development could facilitate livestock management operations by maintaining or improving access to remote locations within allotments. Properly implemented BMPs and reclamation mitigation measures would help maintain rangeland health and forage levels for livestock.

Management for energy and mineral development on split estate lands would not impact lessees and permittees with BLM-administered land leases; however, impacts could occur to livestock grazing on private, state or lands of other ownership as stated above.

Changes in livestock grazing management could impact grazing opportunities in a variety of ways. For example, implementing particular livestock grazing management requirements to benefit GRSG could affect livestock grazing by

increasing operators' costs or changing required management actions. Some management requirements may result in short-term and long-term costs to lessees and permittees could increase, or AUMs could decrease for some lessees and permittees due to the following:

- Implementation of a grazing strategy
- Change in season-of-use or livestock class
- Modification to grazing systems
- Construction or modification of range improvements.

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

Some management changes may require a short-term output of cost for lessees and permittees, but would result in long-term benefits. For example, construction of range improvements to improve livestock distribution and allow use of a larger portion of the rangeland would generally enhance rangeland health in the long term; however, it would have short-term costs. Constructing off-site water sources and fencing riparian and spring sources could keep livestock away from sensitive riparian areas and provide a cleaner more reliable source of water for livestock but would similarly represent an increased cost for lessees and permittees. See **Section 4.21** for a discussion of socioeconomic impacts on grazing.

ACECs may be designated to protect sensitive habitat for the benefit of GRSG. Grazing availability would depend on the designated ACEC management objectives. Restrictions can include total exclusion of grazing from the ACEC, limitations on the class of livestock animal, or the season, duration, or location that livestock are allowed to graze.

#### **4.12.3 Impacts Common to All Alternatives**

##### ***Impacts from Travel and Transportation Management***

Under all alternatives, motorized vehicles would be designated as limited to existing roads and trails, thereby limiting the impacts on livestock grazing from dispersed travel as discussed under *Nature and Type of Effects*. Impacts, such as loss of forage, harassment, or displacement, from motorized and mechanized travel could occur, as described in *Nature and Type of Effects*. Access to authorized BLM uses, such as grazing allotments, would not be impacted in any alternatives. Site specific travel management planning could, when completed, reduce the potential for conflicts between range management and travel management.

**Impacts from Fluid Minerals**

There are 55,880 acres of existing leases in the decision area; this acreage would be consistent across all alternatives. Conflicts between livestock grazing and existing leases could be present as described in *Nature and Type of Effects*. Potential impacts include changes in available forage, reduced forage palatability because of dust on vegetation, limitations on livestock movement, harassment, temporary displacement of livestock, and an increased potential for the introduction and proliferation of noxious weeds that lack the nutritional value needed for productive grazing.

**Impacts from Solid Minerals**

Across all alternatives, impacts from coal management on livestock grazing would be minimal due to the lack of coal development in the planning area.

**Impacts from Fire and Fuels Management**

Objectives for all alternatives for fire management set target sage-brush canopy forage cover at no less than 15 percent cover, which is not necessarily optimal for range management as cover for livestock forage depends on a variety of site specific conditions.

**Impacts from Habitat Restoration and Vegetation Management**

Restoration of native plants under all alternatives has the potential to impact grazing management. In many cases, replacement of non-native plants with native plants would increase suitable forage for livestock and reduce the risk of wildland fire which has the potential to disrupt grazing should it occur. Restoration of crested wheatgrass (*Agropyron cristatum*) has the potential to impact the season of livestock grazing.

**4.12.4 Alternative A****Impacts from Travel and Transportation Management**

Impacts would be as described under *Impacts Common to All Alternatives*.

**Impacts from Recreation**

Direct impacts, such as human disturbance, and indirect impacts through rangeland degradation under Alternative A would be as described under *Nature and Type of Effects*. Under this Alternative there would be no new restrictions on SRPs in the decision area; therefore; livestock could be disturbed by recreational activities or groups in the planning area.

**Impacts from Lands and Realty**

Under Alternative A, approximately 9,708 acres of ROW avoidance areas would be present in the decision area in areas open to livestock grazing (see **Table 4-18**, Impacts on Livestock Grazing from Lands and Realty Actions). As discussed under *Nature and Type of Effects*, disturbance of livestock could be decreased in this area from construction and operation of infrastructure within the ROW.

**Table 4-18**  
**Impacts on Livestock Grazing from Lands and Realty Actions**

<b>Management Action</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW avoidance areas within PH and open to livestock grazing	2,463	0	0	232,964
ROW avoidance areas within GH and open to livestock grazing	7,123	106,508	0	7,123
ROW exclusion areas within GH and open to livestock grazing	0	0	0	0
ROW exclusion areas within PH and open to livestock grazing	0	230,501	0	0

Note: PH and GH for Alternatives B, C, and D, PPH and PGH for Alternative A (no PH or GH is presently designated).

No ROW exclusion areas or lands proposed for withdrawal are present in this alternative.

#### ***Impacts from Range Management***

Grazing would be permitted within PPH or PGH, totaling 314 allotments with 337,165 acres and 69,408 AUMs (**Table 4-17**). An additional 34,398 AUMS would be available on 248,435 acres open to grazing in non-GRSG habitat. Lands would be maintained and restored to maintain healthy ecological conditions, and BLM-administered rangeland management would be directed first to allotments not meeting rangeland health standards due to current livestock; therefore, impacts on grazing management options or permitted AUMs would most likely change in these areas (approximately 105,437 acres).

Livestock grazing would continue to be managed through development and monitoring of AMPs or similar grazing plans and adjustment to grazing systems, with modification to the kind or class of livestock grazing on an allotment, the season of use, the stocking rate, or the pattern of grazing made as needed based on site-specific conditions and monitoring results. Permitted use levels would normally be reviewed and adjusted when permits and leases are renewed.

Vegetative manipulation projects would be designed to minimize impact on wildlife habitat and to improve it whenever possible, which could result in some costs for lessees and permittees, or limitations on manipulation for livestock forage. Long-term benefits to rangeland conditions could also result from these vegetation manipulation projects.

Noxious weed control would be the responsibility of the affected permittee or lessee under weed control cooperative range improvement agreements. Each

year, permittees and lessees would submit records and maps of treatment areas to the BLM; therefore, tracking annual treatments may help to improve or maintain rangeland conditions.

The focus in riparian areas and wetlands would be to improve functioning-at-risk and non-functioning riparian areas and wetlands towards PFC; therefore, there is potential for some impacts on grazing management options and related costs and time required for lessees and permittees in these areas.

Range improvements would be designed to achieve both wildlife and range objectives; however, no specific actions apply to modification for improvements for GRSG. Therefore, impacts on costs for modification of range improvements would likely be the lowest under this alternative.

#### ***Impacts from Fluid Minerals***

Under Alternative A, COAs may be applied to existing fluid mineral leases on a case-by-case basis. Approximately 45,018 acres of existing leases are located in areas open to livestock grazing; therefore, conflicts between grazing and mineral development would be more likely to occur in this area (see **Table 4-19**, Fluid Mineral Impacts on Range Management by Alternative).

**Table 4-19**  
**Fluid Mineral Impacts on Range Management by Alternative**

<b>Management Action</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Acres of existing fluid mineral leases within areas open to grazing	45,012	29,778	0	29,778

#### ***Impacts from Solid Minerals***

Under Alternative A, development of locatable minerals, nonenergy leasable minerals, and salable minerals could be permitted after environmental review. Some restrictions may be put in place, such as requirements in Plan of Operations for locatable minerals, but this alternative would generally be the least restrictive on mineral development, with the highest potential for conflicts with range management. Impacts on livestock grazing would be as described in *Nature and Type of Effects*; however, the intensity would vary by site-specific conditions and restrictions. Potential impacts are changes in available forage, reduced forage palatability because of dust on vegetation, limits on livestock movement, harassment, temporary displacement of livestock, and an increased potential for the introduction and proliferation of noxious weeds.

#### ***Impacts from Mineral Split Estate***

Across all alternatives, federal lessees and permittees would not be impacted by split-estate lands; however, there is the potential for impacts on range management on other lands. Under Alternative A, some minimal regulations are

in place for mineral development on nonfederal surface lands, including permitting and reclamation requirements.

***Impacts from Fire and Fuels Management***

Under Alternative A, treatment for fuels management would allow for some burning to improve wildlife and livestock forage, allowing for management options of lessees and permittees. Impacts would vary based on site-specific management actions, but would fire could be utilized to maintain optimal forage for livestock in the long term.

A minimum rest period from livestock grazing of two growing seasons would be required after any major vegetative disturbance, including wild fire. Specific timing and the type of rest would be determined at the site-specific EA phase. As a result, livestock grazing would typically be excluded from areas following a fire, impacts on and costs and time for lessees and permittees would depend on location of fire in relation to grazing allotments.

***Impacts from Habitat Restoration and Vegetation Management***

Under Alternative A, grazing methods would be designed and monitored to accomplish objectives and meet wildlife habitat needs, as determined in coordination with MFWP. Where objectives for wildlife did not correspond with needs for livestock forage, there is the potential for impacts on range management, specifically ability of lessees and permittees to effectively distribute livestock or fully utilize permitted AUMs.

***Impacts from ACECs***

No new ACECs would be designated under Alternative A; therefore, there would be no additional impacts on range management.

**4.12.5 Alternative B**

***Impacts from Travel and Transportation Management***

Under Alternative B, future travel plans would analyze PH for the need for road closures and limitations would be put in place on development of new roads. Some reduction in routes and limitations on new routes as well as upgrades to existing routes would be in place compared to Alternative A, which could result in indirect reduction in disturbance to livestock in PH.

***Impacts from Recreation***

Direct impacts, such as from human disturbance, and indirect impacts through rangeland degradation under Alternative B are similar to those described under *Nature and Type of Effects*. SRPs in PH would be limited when they were found to have negative impacts on GRSG; therefore, overall SRPs may be reduced with potential benefits to livestock grazing due to decreased disturbance.

**Impacts from Lands and Realty**

Under Alternative B, approximately 106,508 acres of ROW avoidance areas and 230,501 of ROW exclusion areas would be present in the decision area in areas open to grazing (see **Table 4-18**). As discussed under *Nature and Type of Effects*, disturbance of livestock from construction and operation of infrastructure could be decreased in this area as a result of these management actions.

**Impacts from Range Management**

Under Alternative B, acres open to grazing and permitted AUMs would be the same as Alternative A (**Table 4-17**). All GRSG habitat objectives and management would be incorporated into AMPs and permit/lease renewals; therefore, impacts would occur at a site-specific level during the renewal process. Completion of land health assessments and permits/leases would be prioritized within PH. As a result, impacts on range management would be most likely to occur in these areas.

Retirement of permitted grazing uses would be an option in PH, resulting in potential reductions in AUMs in the planning area. Compensation for authorized range improvements would be provided as appropriate.

Vegetation treatments that benefit livestock forage could only be completed if these treatments would also conserve, enhance or improve GRSG habitat; therefore, the management options in PH could be reduced and the ability to fully utilize permitted AUMs could be impacted. Land health assessment utilizing ecological site descriptions would be required to determine if standards of rangeland health as well as GRSG habitat objectives were being met. Impacts from noxious weed control would be the same as those described under Alternative A.

Under Alternative B, riparian areas and wet meadows would be managed for PFC within PH, with potential limitations on grazing within these areas or increased use of fencing/herding, seasonal limitations on grazing, creation of water developments or other measures to manage distribution of livestock so that pressure on these systems is limited; this could result in increased costs or time by lessees and permittees.

Under Alternative B, structural range improvements, such as fences and enclosures, would be allowed in PH, but they must be developed to conserve or enhance GRSG habitat. In addition, fences would require flagging to lessen risk for GRSG strike impacts; therefore, the cost of building or maintaining these structures may be increased as compared to Alternative A. Similarly, new water developments from diversion of spring or seeps would be permitted only when it also would benefit GRSG habitat. Therefore, lessees and permittees may not be able to fully use permitted AUMs if water were limited on a given allotment.

***Impacts from Fluid Minerals***

Under Alternative B, additional RDFs and conservation measures would be applied as COAs in PH to existing leases. These measures would limit surface occupancy on federal leases in PH as well as impose seasonal limits on exploratory drilling, resulting in a decrease in conflicts between livestock grazing and fluid mineral extraction, as described in *Nature and Type of Effects*. Approximately 29,778 acres of existing leases are open to livestock grazing (33 percent less than alternative A), reducing the disturbance from mineral development under this alternative (see **Table 4-19**)

***Impacts from Solid Minerals***

Under Alternative B, additional restriction would be put in place on mineral development as compared to Alternative A. PH would be closed to nonenergy leasable mineral leasing as well as salable mineral disposal. In addition, lands in PH would be recommended for withdrawal from mineral entry. As a result, disturbance of range management from mineral development on would decrease.

***Impacts from Mineral Split Estate***

As described under Alternative A, there would be no impact on BLM permittees from mineral development of these lands. Impacts on private range management would likely decrease in PH due to the application of the same conservation measures as applied on BLM-administered lands.

***Impacts from Fire and Fuels Management***

Under Alternative B, suppression of fire would be prioritized when PH was threatened. As a result, disturbance to grazing could decrease because fewer wildfires require fewer post-fire rest periods. However, in the long term vegetative condition may become less than ideal for grazing as cover and sagebrush density would likely increase and available forage decrease.

***Impacts from Habitat Restoration and Vegetation Management***

Under Alternative B, vegetation treatments would still occur, given special consideration for the protection and maintenance of sagebrush ecosystems. Projects would be prioritized in areas thought to be limiting GRSG abundance based on defined habitat parameters. Impacts could occur to range management when objectives for range management did not match with those for GRSG habitat. Post restoration management requirements could also result in changes to grazing systems, AUM levels or other range management changes, with resulting potential for an increase in costs and time for lessees and permittees.

***Impacts from ACECs***

Impacts would be the same as under Alternative A.

#### 4.12.6 Alternative C

##### ***Impacts from Travel and Transportation Management***

Due to the removal of grazing from PH and GH, impacts from travel management would be limited. However, the type of impacts described under Alternative A would still occur in areas that are PH or GH in the decision area.

##### ***Impacts from Recreation***

Impacts from recreation on grazing would be limited due to removal of grazing from all allotments in PH and GH under this alternative. However, the type of impacts described under Alternative A would still occur in areas that are not PH or GH in the decision area.

##### ***Impacts from Lands and Realty***

Impacts from lands and realty action on livestock grazing would be limited by the removal from grazing on all allotments in PH and GH. There is potential for indirect impacts to occur on BLM-administered lands outside of GRSG habitat should ROW grants and associated development and/or livestock grazing increase in this area.

##### ***Impacts from Range Management***

Management under Alternative C would remove livestock grazing from all allotments in PH and GH, for a total of 337,165 acres closed to grazing in the decision area, on 305 allotments with 69,408 removed AUMs (see **Table 4-17**). Like Alternative A, 34,398 AUMS would be available on 248,435 acres open to grazing in non-GRSG habitat.

Removal of grazing from all PH and GH would result in economic impacts on lessees and permittees. As discussed under *Nature and Type of Effects*, lessees and permittees would be faced with reducing AUMs for their operations or locating replacement forage, often at higher costs than that currently obtained from BLM-administered lands, with potential impacts on individual leases/permits as well as the local community. Closures would also impact ability of lessees and permittees current seasonal rotations or other management strategies that utilize both BLM-administered and private lands.

Existing structural range improvements under Alternative C would require modifications or removal when determined to have a high risk of GRSG strike. In addition, management actions would allow no new water developments and could dismantle existing developments. Lessees/permittees who have investments on BLM-administered lands in PH and GH would be impacted and could be subject to compensation. In addition, the substantial range infrastructure installed by the BLM would fall into disrepair and the investments would be lost. Furthermore, approximately 3,400 additional miles of fencing may be required to exclude livestock from BLM-administered lands where grazing is excluded, representing potential additional costs.

Removal of range improvements and water developments on PH and GH would also further restrict management options. Lessees and permittees who currently rotate pastures between private and BLM-administered lands may need to construct additional water developments or other structural range improvements on private pastures, resulting in increased time and costs.

As a result of removal of grazing from PH and GH, there is also the potential for increase conflicts between grazing and other resources and resource uses on lands of other surface ownership should livestock grazing increase in this area. For example, under this alternative, if permittees and lessees were to lose the forage that the BLM currently provides, many of them would try to increase forage production on their private and other leased land. This could accelerate the conversion of private native range, including GRSG habitat, to agricultural or introduced grass production.

***Impacts from Fluid Minerals***

Under Alternative C, due to the removal of livestock grazing from all PH and GH, impacts from mineral development on range management in this habitat would be negligible. There is potential for an increase in conflicts between grazing and mineral development in areas outside of PH and GH, should grazing and mineral development increase in this area.

***Impacts from Solid Minerals***

Under Alternative C, impacts from solid minerals on grazing would be negligible due to the limitations on mineral development and the removal of livestock grazing from all PH and GH. There is potential for an increase in conflicts between grazing and mineral development in areas outside of PH and GH, should grazing and mineral development increase in this area.

***Impacts from Mineral Split Estate***

As in Alternative A, there is no impact of split estate mineral development on BLM lessees and permittees. It is likely that mineral development on split-estate PH and GH under this alternative would result in the least disturbance to private range management due to the application of conservation measures to these areas.

***Impacts from Fire and Fuels Management***

Under this Alternative, impacts on range management would be minimized due to the removal of livestock grazing from PH and GH. However, the type of impacts described under Alternative A would still occur in non-PH or GH in the decision area.

***Impacts from Habitat Restoration and Vegetation Management***

Impacts on range management in PH and GH under this alternative would be minimized due to the removal of grazing from PH and GH. However, the type of impacts described under Alternative A would still occur in non PH or GH areas of the decision area.

***Impacts from ACECs***

Under Alternative C, 96,246 acres of the planning area would be designated as an ACEC to protect GRSG. Due to the removal of grazing from PH and GH, impacts from the ACEC designation would be limited.

**4.12.7 Alternative D*****Impacts from Travel and Transportation Management***

Under Alternative D, impacts would be similar to those described under Alternative B, but with additional restrictions on upgrades, realignment of roads, and requirements for site-specific travel management planning completion applied to PH and GH. As a result, disturbance from travel management on livestock grazing would be limited.

***Impacts from Recreation***

Impacts would be the same as under Alternative B.

***Impacts from Lands and Realty***

Under Alternative D approximately 240,087 acres would be proposed as a ROW avoidance area within areas open to livestock grazing. Impacts would be as described in Alternative A, but with increased intensity, due to the larger area that is less likely to be developed (see **Table 4-18**).

***Impacts from Range Management***

Similar to Alternative A, grazing would be allowed on all lands identified as suitable (see **Table 4-17**).

Within PH, the BLM would conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. State objectives would be used for fine-scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS. Similar to Alternative B, the BLM would prioritize completion of land health assessments in PH. Like Alternative B, management under Alternative D would focus forage treatments in PH.

Management objectives would require analysis of grazing systems during the grazing authorization renewal process to determine the best treatment for maintaining or improving PH. Modifications to grazing systems could be required, increasing costs to lessees and permittees.

Impacts from noxious weed control would be the same as under Alternative B.

Actions to reduce grazing in riparian areas would include fencing and herding techniques or seasonal use or livestock distribution changes to meet GRSG

habitat objectives. Some grazing within these areas may be allowed at site-specific locations when consistent with GRSG objectives. However, options for permittees and lessees would be limited and their costs could be increased should additional fences be required.

Overall, impacts would be similar to Alternative B but would vary in site-specific implementation.

#### ***Impacts from Fluid Minerals***

Acres of existing leases open to grazing would be the same as in Alternative B (29,778 acres, 33 percent less than Alternative A; see **Table 4-19**). RDFs and conservation measures applied as COAs to existing leases to limit fluid minerals impacts would also be similar to those described under Alternative B, but under this alternative would have greater flexibility for site-specific modification. As in Alternative B, surface disturbing/disruptive activities in PH would avoid or minimize disturbance to GRSG or their habitat; therefore, conflicts between range management and fluid mineral development would be minimized in this area. In addition to the measures included under Alternative B, measures limiting placement of utility structures and noise would further reduce disturbance of livestock and livestock forge by mineral development as compared with Alternative A.

#### ***Impacts from Solid Minerals***

Under Alternative D, impacts from solid mineral development would be similar to those described under Alternative A. Some additional site-specific restriction on nonenergy minerals and salable minerals could result in a reduction in development where not in the public interest; therefore, impacts on livestock grazing from mineral development could be slightly reduced as compared with Alternative A.

#### ***Impacts from Mineral Split Estate***

Under Alternative D, as described in Alternative A, there would be no impact on BLM lessees and permittees. Conservation measures would be applied when federal action (mineral exploration or development) occurs, resulting in some potential reduction in disturbance for livestock on lands not administered by the BLM.

#### ***Impacts from Fire and Fuels Management***

Under Alternative D, no fuels treatments would be allowed in GRSG winter range unless they would benefit GRSG. Rest requirements would vary based on site-specific conditions. As a result, some site-specific locations could have restrictions on range management due to fire and fuels management.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Under Alternative D, restoration projects to benefit GRSG habitat improvements would be prioritized. Impacts would be similar to that described in Alternative B. However, under this alternative, any changes required to

grazing systems, AUM levels or other changes to range management would be determined in consultation with lessees and permittees; therefore, the potential for impacts would be reduced.

#### **Impacts from ACECs**

Impacts would be the same as under Alternative A.

### **4.13 AREAS OF CRITICAL ENVIRONMENTAL CONCERN**

#### **4.13.1 Methods and Assumptions**

Direct impacts on ACECs are considered to be those that either impair or enhance the relevant and important values for which the ACEC was proposed for designation. This analysis focuses on the impacts on relevant and important values from the special management derived from ACEC designation or, under Alternatives A, B and D, where a GRSG ACEC is not proposed for designation, the management actions and allocations for other resources and resource uses. In this case, the relevant and important values considered are the unique pine forest and shale landscape of the existing Acid Shale-Pine Forest ACEC (which would continue to be managed as an ACEC under all alternatives) and GRSG habitat in the proposed GRSG ACEC (Alternative C). All impacts discussed are direct impacts, though some may not occur immediately after implementation of management actions.

#### **Indicators**

**Table 4-20**, Comparison of ACEC Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects to ACECs under each alternative.

**Table 4-20**  
**Comparison of ACEC Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Changes in the size or location of ACEC boundaries	No change	No change	New GRSG ACEC results in net increase of 96,246 acres	No change
Specific management provisions designed to protect the relevant and important values for which the ACEC was designated	No change	No change	Manage 96,246 acres of new GRSG ACEC as ROW exclusion area	No change

#### **Assumptions**

The analysis includes the following assumptions:

- Permitted activities would not be allowed to impair the relevant and important values for which the ACEC(s) are designated. The

exception is locatable minerals; until withdrawn from mineral entry, a mining claim can be filed, and subsequent mining activities could have an impact. However, measures would have to be identified in a Plan of Operations to mitigate unnecessary and undue degradation.

#### **4.13.2 Nature and Type of Effects**

Special status species management objectives would prevent degradation of, and could improve, relevant and important values where a GRSG ACEC is designated to protect such values. BLM management could protect the relevant and important values in the GRSG ACEC independent of an ACEC designation. Refer to **Section 4.2** for a discussion of impacts on GRSG habitat.

In general, management actions that protects resources—such as surface-disturbance restrictions, management for desired habitats, travel restrictions and closures, livestock grazing, and recreation restrictions—would help maintain and improve the important and relevant values within ACECs. Management actions that create the potential for resource degradation—such as mineral development, livestock grazing, and infrastructure development—could impact the relevant and important values for which an ACEC is designated. Recreation and travel within ACECs could impact ACEC values. Limiting motorized travel to existing routes and trails would reduce surface disturbance and the potential for related GRSG habitat loss. Dispersed recreation activities in the planning area affect the unique soils found within the Acid Shale-Pine Forest ACEC. Management approaches that direct recreation to specific areas could result in more predictable and manageable impacts.

Identifying ACECs as ROW exclusion or avoidance areas would protect relevant and important values by reducing (for avoidance areas) or eliminating (for exclusion areas) impacts from development requiring a land use authorization, including utilities, access roads, and renewable energy projects. Impacts from such development on GRSG habitat include compaction, erosion, and potentially habitat fragmentation. Impacts from development on the Acid Shale-Pine Forest ACEC include soil compaction and erosion and removal or disruption of the ACEC's unique plant community, which includes slow growing ponderosa pine trees. Due to the area's severely erodible soils and lack of understory vegetation, development would impact ACEC values beyond the footprint of the grant.

Energy and mineral development could impact ACEC values by increasing soil erosion potential and through the removal or disruption of unique ponderosa pine trees. Where GRSG habitat exists, energy and mineral development could degrade and fragment habitat. Construction, operation, and maintenance activities could disturb GRSG populations. Closing ACECs to fluid minerals leasing would help protect relevant and important values by eliminating surface-disturbance associated with such development.

Depending on their extent, location, and severity, wildfires could cause short- and long-term damage to ACEC values, particularly by removal of critical sagebrush habitats. ES&R techniques would be applied to minimize impacts where special values are at risk. If these techniques are successful, wildfires could also cause long-term improvement in ACEC values by maintaining natural vegetative ecosystem cycles.

Livestock grazing could impact ACEC values by increasing soil erosion potential and reducing understory plant species. Closing ACECs to livestock grazing would help protect relevant and important values by eliminating soil and vegetation disturbance associated with grazing, but could also increase the risk for fire due to increased fuel loads.

Implementing management for the following resources would have negligible or no impact on ACECs and are therefore not discussed in detail: solid minerals, mineral split estate, fire and fuels management, and habitat restoration and vegetation management.

#### **4.13.3 Impacts Common to All Alternatives**

Alternative C is the only alternative under which the BLM proposes a new ACEC. As such, analysis of impacts common to all alternatives focuses on the relevant and important values of the Acid Shale-Pine Forest ACEC, and impacts on these values from the special management derived from ACEC designation.

##### ***Impacts from Range Management***

Under all alternatives, the Acid Shale-Pine Forest ACEC would continue to be open to grazing. Impacts on the ACEC would be consistent with those described in *Nature and Type of Effects*, including soil erosion potential and reducing understory plant species.

##### ***Impacts from Fluid Minerals***

Under all alternatives, the Acid Shale-Pine Forest ACEC would continue to be closed to fluid mineral leasing and development and would therefore be protected from the impacts, such as soil erosion and the removal or disruption of unique ponderosa pines. Where GRSG habitat exists, energy and mineral development could degrade associated with oil and gas development, as described under *Nature and Types of Effects*.

#### **4.13.4 Alternative A**

##### ***Impacts from Travel and Transportation Management***

Under Alternative A, the BLM would continue to limit motorized travel to existing routes and trails within the Acid Shale-Pine Forest ACEC. The types of impacts are the same as those described under *Nature and Types of Effects*, including limiting surface disturbance.

**Impacts from Recreation**

Impacts from recreation on the relevant and important values for which the Acid Shale-Pine Forest ACEC was established would be the same as those described under *Nature and Types of Effects*. Dispersed recreation could affect soils within the ACEC.

**Impacts from Lands and Realty**

The Acid Shale-Pine Forest ACEC would continue to be managed as a ROW avoidance area; impacts from ROW development, including soil compaction and erosion, and removal or disruption of the ACEC's unique plant community, are described under *Nature and Types of Effects*.

**Impacts from ACECs**

**Table 4-21**, ACECs by Alternative, provides a comparison of ACEC acreages by alternative. Under Alternative A, the BLM would continue to manage the Acid Shale-Pine Forest as the only ACEC within GRSG habitat in the planning area. The Square Butte ACEC, Judith Mountains Scenic Area ACEC, and Collar Gulch ACEC are also located in the planning area, but are located outside GRSG habitat. Management activity to protect GRSG would not affect the relevant and important values for which the ACECs were established or the BLM management prescriptions for these ACECs. The BLM would continue to manage lands and PH in accordance with existing management policies.

**Table 4-21**  
**ACECs by Alternative**

ACEC	Alternative			
	A	B	C	D
Acid Shale Pine Forest (acres)	2,463	2,463	2,463	2,463
GRSG ACEC (acres)	0	0	96,246	0

**4.13.5 Alternative B**

Under Alternative B, the BLM would continue to manage the Acid Shale-Pine Forest as the only ACEC in the planning area. The BLM would implement new management strategies to protect PH but without establishing an ACEC. Refer to **Section 4.2** for a discussion of impacts on GRSG habitat.

**4.13.6 Alternative C**

Under Alternative C, in addition to the Acid Shale-Pine Forest ACEC, the BLM would manage a new GRSG ACEC. As a result, the total ACEC acreage in the planning area would increase by 96,246 acres. BLM management for the Acid Shale-Pine Forest (2,463 acres) would continue to be tailored to protect the relevant and important values for which the ACEC was originally designated.

Management actions in the new GRSG ACEC would be the same as those actions proposed for GRSG habitat outside the ACEC, including ROW

exclusion areas, closures to mineral entry, and livestock grazing limitations. Designation of the GRSG ACEC boundary would bring heightened management attention and public awareness to GRSG habitat, and would further the management objective of helping to maintain and improve the important and relevant values within ACECs.

***Impacts from Travel and Transportation Management***

The BLM would evaluate the need for permanent or seasonal road closures and would avoid new construction within ACECs. If the BLM determines there is a need to close certain routes, then those closures would benefit the values for which the ACECs would be designated. Effects on ACECs under Alternative C would be the same as those described under Alternative B, except that Alternative C would include additional road closures within four miles of active GRSG leks.

***Impacts from Recreation***

Impacts from recreation to the relevant and important values for which the Acid Shale-Pine Forest ACEC was established would be the same as those described under *Nature and Types of Effects*.

***Impacts from Lands and Realty***

Under Alternative C, the Acid Shale-Pine Forest would continue to be managed as an ACEC, with the addition of the GRSG ACEC (96,246 acres), which would bring added restrictions to lands and realty actions to protect GRSG habitat to minimize surface-disturbing activities. The types of impacts are the same as those described under *Nature and Types of Effects*.

***Impacts from Fluid Minerals***

In addition to the impacts described in *Impacts Common to All Alternatives*, under Alternative C, the BLM would also pursue options to buy out existing fluid minerals leases. Management to reduce fluid mineral development would also protect the new GRSG ACEC from the impacts associated with fluid minerals exploration, development, and production, described under *Nature and Types of Effects*.

***Impacts from ACECs***

The designation and management of the GRSG ACEC would be used as a way to protect GRSG habitat. Management prescriptions to protect habitat under this ACEC would be similar to protective prescriptions under Alternatives B and D but would have the added ACEC administrative boundary designation. ACEC designation could heighten awareness of the resource and help prioritize BLM management. Acquisition of lands within a designated ACEC could help protect relevant and important values by bringing additional acres under BLM control and managing those acres according to special protection of GRSG habitats.

**4.13.7 Alternative D**

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

**4.14 AIR RESOURCES****4.14.1 Methods and Assumptions****Indicators**

**Table 4-22**, Comparison of Air Resource Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on air resources under each alternative.

**Table 4-22**  
**Comparison of Air Resource Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
A substantial change in the likelihood or severity of wildland fire/management actions that substantially inhibit a response to or appropriate treatments to prevent fire	Fires more likely to occur /no change	Fires less likely to occur /no change	Fires more likely to occur because, by removing grazing, fine fuels would increase	Fires more likely to occur/no change
Acres closed to new road construction	0	0	274,435	0
Acres closed to salable mineral disposal	2,538	279,097	453,969	2,538
Acres closed to nonenergy leasing and salable mineral disposal	2,538	279,097	453,969	2,538

**Assumptions**

The analysis includes the following assumptions:

- Air resource impacts can be localized or regional.
- Weather-related events and wildfires may cause or contribute to local or regional air resource impacts.

**4.14.2 Nature and Type of Effects**

Actions that reduce emissions of air pollutants improve air resources. Actions that initiate or increase emissions of air pollutants can degrade air resources, including increased concentrations of air pollutants, decreased visibility, increased atmospheric nitrogen and sulfur deposition on soils and vegetation, and acidification of sensitive water bodies.

Emissions of hazardous air pollutants could potentially result in localized increased risk of impacts on human health. Criteria and hazardous air pollutants can negatively impact human health in a variety of ways. Exposure to air pollution most often affects the respiratory system, and is often also associated with pulmonary, cardiac, vascular, and neurological impairments (EPA 2010b). Children and other high-risk groups, such as the elderly, pregnant women, and individuals with chronic heart and lung diseases, are especially susceptible to impacts from air pollution (EPA 2010b).

Actions that increase emissions of air pollutants can result in negative effects on air quality related values, including visibility and atmospheric deposition. An increase in SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions can result in decreased visibility, increased atmospheric nitrogen and sulfur deposition on soils and vegetation, and acidification of sensitive water bodies. Fugitive dust could potentially result in increases in ambient concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> resulting in localized impacts on vegetation and increases in atmospheric deposition. Particulate matter also contributes to haze and limits visibility (EPA 2012g). Ozone, which is formed by a chemical reaction between volatile organic compounds and nitrogen oxides, contributes to smog, which limits visibility (EPA 2012h).

Particulate matter emissions (fugitive dust) are primarily caused by earth-moving activities and vehicular traffic on unpaved roads and surfaces associated with development and operation.

Implementing management for the following resources would have negligible or no impact on air resources and are therefore not discussed in detail: travel and transportation management (except for Alternative C), recreation, lands and realty, range management, fluid minerals, mineral split estate, habitat restoration and vegetation management, and ACECs.

#### **4.14.3 Alternative A**

Air resource impacts under Alternative A would be identical to impacts associated with current management as described above in *Nature and Type of Effects*. No changes to criteria air pollutant or hazardous air pollutant emissions would occur.

#### **4.14.4 Alternative B**

##### ***Impacts from Fire and Fuels Management***

Fires, particularly uncontrolled fires, can significantly affect air quality by introducing large amounts of particulate, CO, atmospheric mercury, ozone precursors, and volatile organic compounds into the air, affecting both visibility and human health (BC Air Quality 2013). Controlling fuel load through prescribed burns and vegetation treatments can reduce the risk of uncontrolled wildfire and resultant effects on air resources (Wiedinmyer and Hurteau 2010).

Management under Alternative B would generally restrict prescribed burning within PH; however, fires would be less likely to occur compared with Alternative A because management actions would decrease the risk of human-caused ignitions and increase the level of fire suppression in PH. Management actions that would decrease human risk of fire include limiting route construction in PH, emphasizing nonmotorized recreation, and closing areas to mineral development. Because wildfires would be less likely to occur, there would be fewer fire-related impacts on air resources.

Habitat reconstruction or vegetation treatments used in fire and fuels management would cause negligible increases in exhaust and fugitive dust.

#### ***Impacts from Solid Minerals***

Under Alternative B, 279,097 acres would be closed to salable material disposal and nonenergy solid mineral leasing. Development of these mineral resources results in short-term and long-term emissions of criteria and hazardous air pollutants during fuel combustion in vehicles and construction equipment; it also produces particulate emissions from surface disturbance. Closing areas with solid mineral potential to development would have the potential to result in fewer impacts on air resources, due to decreased emissions that would otherwise be associated with development of these mineral resources.

### **4.14.5 Alternative C**

#### ***Impacts from Fire and Fuels Management***

Impacts on air resources from fire and fuels management would be the same as described under Alternative B, except restrictions would be applied to PH and GH.

#### ***Impacts from Solid Minerals***

Under Alternative C, 453,969 acres would be closed to salable material disposal and nonenergy solid mineral leasing. As described under Alternative B, closing areas with solid mineral potential to development would have the potential to result in fewer impacts on air resources, due to decreased emissions that would otherwise be associated with development of these mineral resources.

#### ***Impacts from Travel and Transportation Management***

Under Alternative C, the BLM would close 274,435 acres of the planning area to new road construction compared with Alternative A. Road construction has short-term effects associated with construction of the roads, including fugitive dust emissions from surface disturbance and exhaust emissions associated with road construction equipment, worker vehicles, and material deliveries, and long-term effects associated with road use and maintenance. Prohibiting new road construction would likely result in fewer impacts on air resources, due to decreased emissions associated with road construction and use.

#### 4.14.6 Alternative D

##### ***Impacts from Fire and Fuels Management***

Impacts on air resources from fire and fuels management would be similar to those described under Alternative B in that restrictions may decrease the risk of fire from human-caused resource use. Under Alternative D, emphasis would be placed on tailoring management objectives to local site conditions and monitoring sites to ensure fuels treatments are helping to meet objectives; therefore, habitat may be further improved in the long term, which may reduce the risk of significant wildfires.

##### ***Impacts from Solid Minerals***

Under Alternative D, no new areas would be closed to salable material disposal and nonenergy solid mineral leasing. Impacts on air resources would be the same as those under Alternative A.

### 4.15 CLIMATE

#### 4.15.1 Methods and Assumptions

##### ***Indicators***

**Table 4-23**, Comparison of Climate Change Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects related to climate change under each alternative.

**Table 4-23**  
**Comparison of Climate Change Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
A substantial change in the likelihood or severity of wildland fire / management actions that substantially inhibit a response to or appropriate treatments to prevent fire	Fires more likely to occur /no change	Fires less likely to occur /no change	Fires are more likely because removing grazing would increase fine fuels	Fires more likely to occur/no change
Acres closed to new road construction	0	0	274,435	0
Acres closed to salable mineral disposal	2,538	279,097	453,969	2,538
Acres closed to nonenergy leasing and salable mineral disposal	2,538	279,097	453,969	2,538

##### ***Assumption***

The analysis assumes that there is a correlation between global concentrations of GHGs and climate change.

#### 4.15.2 Nature and Type of Effects

Management actions that could affect climate change would include actions that increase GHG emissions, actions that reduce GHG emissions, actions that create carbon sinks, and actions that eliminate or damage carbon sinks.

While GHG emissions or GHG sequestration may result from many of the proposed management actions, these changes would be quite small relative to annual state, national, or global GHG emissions. For reference, the amount of total gross emissions in Montana in 2005 was 36.8 million metric tons of carbon dioxide equivalents (MTDEQ 2007). Relative to state and national GHG emissions, emission changes due to management actions associated with this RMPA would be negligible.

Implementing management for the following resources would have negligible or no impact on climate and are therefore not discussed in detail: travel and transportation management (except for Alternative C), recreation, lands and realty, range management, fluid minerals, mineral split estate, habitat restoration and vegetation management, and ACECs.

#### 4.15.3 Alternative A

Climate impacts under Alternative A would be identical to impacts resulting from current management as described above in *Nature and Type of Effects*. No changes to GHG emissions would occur.

#### 4.15.4 Alternative B

##### ***Impacts from Fire and Fuels Management***

Fires, particularly uncontrolled fires, can emit large quantities of GHGs into the atmosphere, including carbon dioxide, methane, and nitrous oxide (EPA 2012f, page 7-21 to 7-22); fires also remove vegetation that acts as a carbon sink. Controlling fuel load through prescribed burns and vegetation treatments could reduce the risk of uncontrolled wildfire and resultant releases of GHG emissions (Wiedinmyer and Hurteau 2010).

Management under Alternative B would generally restrict prescribed burning within PH; however, fires would be less likely to occur compared with Alternative A because management actions would decrease the risk of human-caused ignitions and increase the level of fire suppression in PH. Because wildfires would be less likely to occur compared with Alternative A, there would be lower GHG emissions and smaller contributions to climate change than under Alternative A.

##### ***Impacts from Solid Minerals***

Under Alternative B, 279,097 acres would be closed to salable material disposal and nonenergy solid mineral leasing. Development of these mineral resources results in short-term and long-term emissions of GHG pollutants during fuel combustion in vehicles and construction equipment; it also removes vegetation

and releases sequestered carbon. Closing areas with solid mineral potential would likely result in fewer GHG emissions in the planning area.

#### **4.15.5 Alternative C**

##### ***Impacts from Fire and Fuels Management***

Impacts from fire and fuels management would be the same as described under Alternative B, except restrictions on both resource use and fuels treatment options would be applied to PH and GH.

##### ***Impacts from Solid Minerals***

Under Alternative C, 453,969 acres would be closed to salable material disposal and nonenergy solid mineral leasing. As described under Alternative B, closing areas with solid mineral potential would likely result in fewer GHG emissions, and fewer contributions towards climate change.

##### ***Impacts from Travel and Transportation Management***

Under Alternative C, the BLM would close 274,435 acres of the planning area to new road construction compared with Alternative A. Road construction and use emits GHGs through the combustion of fuel in vehicles and construction equipment. Prohibiting new road construction could reduce GHG emissions associated with road construction and use.

#### **4.15.6 Alternative D**

##### ***Impacts from Fire and Fuels Management***

Impacts from fire and fuels management would be similar to those described under Alternative B in that restrictions may decrease the risk of fire from human-caused resource use and associated GHG emissions. Under Alternative D, emphasis would be placed on tailoring management objectives to local site conditions and monitoring sites to ensure fuels treatments are helping to meet objectives; therefore, habitat may be further improved in the long term, which may reduce the risk of significant wildfires. This would have the potential to result in fewer emissions of GHGs and fewer contributions towards climate change, as well as improve carbon sequestration in vegetation.

##### ***Impacts from Solid Minerals***

Under Alternative D, no new areas would be closed to salable material disposal and nonenergy solid mineral leasing. Impacts on climate change from solid minerals would be the same as under Alternative A.

## 4.16 SOIL RESOURCES

### 4.16.1 Methods and Assumptions

#### *Indicators*

**Table 4-24**, Comparison of Soil Resources Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects to soils resources under each alternative.

**Table 4-24**  
**Comparison of Soil Resources Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Acres managed as ROW avoidance areas	9,708	112,341	0	233,219
Acres managed as ROW exclusion areas	0	233,219	345,560	0
Acres found unsuitable for surface coal leasing	0	385,693	639,927	0
Acres closed to nonenergy leasing and salable mineral disposal	0	279,097	453,969	0

#### *Assumptions*

The analysis includes the following assumptions:

- Soils of the BLM-administered lands would be managed to maintain productivity and promote sustained yields while keeping erosion at minimal/acceptable levels and preventing physical or chemical degradation.
- Proposed surface-disturbing projects would be analyzed to determine suitability of soils to support or sustain such projects and designed to minimize soil loss.
- Prime Farmlands would be protected from unnecessary and irreversible conversion to nonagricultural uses through identification as such and special attention during construction and reclamation.
- Achieving or maintaining Standards for Rangeland Health and Guidelines for Livestock Grazing Management generally are effective in managing the effects on soils from livestock grazing. Adjustments to grazing authorizations would be made on a case-by-case basis when site-specific studies indicate changes in management are needed.
- BLM management actions and objectives would be consistent with soil resource capabilities.

- Fuels projects, as well as planned and un-planned fire, that contribute towards establishment of a more "natural" fire regime would have long-term benefits on soil health.
- Restoration would effectively mitigate long-term surface-disturbing effects.
- Surface-disturbing actions related to fluid mineral development would comply with Onshore Oil and Gas Orders and Gold Book surface operating standards and guidelines (and subsequent updates). These orders and standards and guidelines would mitigate most effects.

#### 4.16.2 Nature and Type of Effects

Activities that disturb, compact, contaminate, mix soil horizons, or remove vegetation from soils are generally considered to negatively affect soil health. Impacts on soil resources can result from a number of causes, including improper livestock grazing, recreation, mineral resource activities, renewable energy development, and road construction. The intensity and extent of impacts on soil resources are determined in part by the type and location of the surface-disturbing activities and surface occupancy. Impacts on soil resources can also be affected by any applicable stipulations and Plan of Operations that address site-specific environmental concerns and require mitigation to stabilize soil, to prevent unnecessary erosion, and to revegetate disturbed surfaces.

Direct and indirect impacts from resource programs to soil resources are generally mitigated by avoiding or minimizing the impact using designations such as ROW exclusion and avoidance areas, and stipulations such as NSO. Impacts that cannot be avoided are generally minimized by the application of COAs, BMPs, and standard operating procedures.

Mixing of soil horizons is another concern with surface-disturbing actions, as is loss of the "A" horizon (i.e., top layer of the soil horizon or the topsoil) through erosional forces (e.g., wind, water). Mixing of topsoil and subsoil and loss of the "A" horizon remove surface cover for erosion control and organic matter inputs for nutrient recycling. The result is decreased soil productivity in the long term, inhibiting revegetation, decreasing soil reclamation potential, and increasing susceptibility for noxious and invasive species.

Surface-disturbing activities and surface occupancy can impact soil resources by compacting soil. In some cases, soil compaction aids in plant establishment and growth. However, too much compaction decreases water infiltration rates and gas exchange rates. Decreased gas exchange rates can cause aeration problems, induce nitrogen and potassium deficiency, and negatively impact root development, which is a key component of soil stabilization. As soil compaction increases, the soil's ability to support vegetation diminishes because the resulting increase in soil strength and change in soil structure (loss of porosity) inhibit root system growth and reduce water infiltration. As vegetative cover,

water infiltration, and soil stabilizing crusts are diminished or disrupted, the surface water runoff rates increase, further accelerating rates of soil erosion.

Poor soil health generally limits the ability of an area to support vegetation, particularly native vegetation such as sagebrush. Any impacts that adversely affect soil health would also adversely affect sagebrush.

Travel across land by foot, bicycle, horse or OHV results in vegetation loss, soil compaction, and soil erosion. Management approaches that designate travel to specified routes can result in more predictable, localized and manageable impacts. Selectively locating travel routes away from areas of sensitive soil conditions can minimize the extent of these effects, ideally limiting them to the footprint of the trail.

Most recreation on BLM-administered lands results in vegetation loss, soil compaction, and soil erosion. Management approaches that direct recreation to specific areas and avoid dispersed recreation can result in more predictable, localized and manageable impacts.

Lands and realty management decisions affect where ground disturbing activities can and cannot occur. Ground disturbing activities could result in the compaction of soils, the erosion of soils, or vegetation loss which reduces soil stability. ROW exclusion and ROW avoidance areas protect certain areas from compaction and erosion.

Fluid mineral development generally requires temporary roads, wells, and associated well pads. Local soil health and characteristics within project footprints are typically impacted by compaction and clearing of vegetation. Restoration and revegetation efforts can restore soil health over the long term once mineral extraction activities are complete.

Solid mineral development generally requires roads and large areas of soil excavation. Local soil health and characteristics within project footprints are typically impacted by excavation, compaction, erosion, and vegetation clearing. Restoration and revegetation efforts can restore soil health over the long term once mineral extraction activities are complete, but landscapes are often scarred and areas of prior soil cover are often permanently altered through open pits, mineshafts, and other features.

Grazing is known to alter vegetation and biological soil crust communities. Livestock grazing can have adverse impacts on soils, particularly in the case of high-intensity, low-duration, grazing systems in small pastures. Modified grazing management can be necessary to maintain soil health where soils are found to be sensitive to livestock disturbances (for example, soil on steep slopes and fragile soils). Properly managed grazing can protect soils and help provide healthy plant communities.

Implementing management for the following resources would have negligible or no impact on soil resources and are therefore not discussed in detail: fire and fuels management, and ACECs.

#### 4.16.3 Impacts Common to All Alternatives

##### ***Impacts from Habitat Restoration and Vegetation Management***

Under all alternatives habitat restoration would occur and would be implemented based on environmental variables that indicate areas most likely to succeed in restoration. Restoring habitat generally has a beneficial effect on soils, and soils that currently have a high restoration potential value would tend to support restorative vegetation easier due to proper soil conditions, such as low salt content, adequate water retention, and available rooting depth.

**Table 4-25**, Quantitative Impact Summary by Alternative for Soils, provides a comparison of the quantifiable impacts of each alternative to soils.

**Table 4-25**  
**Quantitative Impact Summary by Alternative for Soils**

<b>Resource Use</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW exclusion area (acres)	0	233,219	345,560	0
ROW avoidance area (acres)	9,708	112,341	0	233,219
Closed to livestock grazing (acres)	0	0	337,165	0
Unsuitable for surface coal mining (acres)	0	385,693	693,927	0
Closed to salable minerals (acres)	2,538	279,097	453,969	2,538
Closed to nonenergy leasing (acres)	0	279,097	453,969	0

#### 4.16.4 Alternative A

##### ***Impacts from Travel and Transportation Management***

Direct impacts on soils from travel and transportation management are discussed above under *Nature and Type of Effects*. Under Alternative A, motorized cross country travel would be restricted to existing roads and trails throughout the project area on BLM-administered lands, which would reduce new soil disturbances and localize further disturbance to existing travel routes.

##### ***Impacts from Recreation***

Direct impacts on soils, including vegetation loss, soil compaction, and soil erosion, from recreation is discussed above under *Nature and Type of Effects*. Under Alternative A, SRPs would be evaluated on a case-by-case basis

throughout the project area. Management approaches that direct recreation to specific areas and avoid dispersing recreation could result in more predictable, localized, and manageable impacts. This would result in less vegetation loss, soil compaction, and soil erosion from recreation.

#### ***Impacts from Lands and Realty***

Direct impacts on soils from ground-disturbing activities related to ROW development are discussed above under *Nature and Type of Effects*. As shown in **Table 4-25**, Alternative A has two ROW avoidance areas and no ROW exclusion areas. The ROW avoidance areas make up 9,708 acres and are associated with the Acid Shale-Pine Forest ACEC and Judith River Canyon. Surface-disturbing activities related to ROW development would be restricted in the ROW areas, limiting impacts on soil resources.

#### ***Impacts from Range Management***

Direct impacts on soils from range management are discussed above under *Nature and Type of Effects*. Under Alternative A, livestock grazing would continue to be managed through the development and monitoring of AMPs which use guidelines to maintain or enhance ecological condition, enhance vegetation production, maintain and enhance wildlife habitat, protect watersheds, and reduce bare ground by introducing soil stabilizing vegetation cover that is applicable to the soil subgroup type. Achieving or maintaining Standards for Rangeland Health and Guidelines for Livestock Grazing Management generally are effective in managing the effects on soils from livestock grazing. Grazing would continue to alter vegetation and biological soil crust communities.

#### ***Impacts from Fluid Minerals***

Direct impacts, such as erosion and compaction, to soils from fluid minerals development are discussed above under *Nature and Type of Effects*. Alternative A does not prohibit surface occupancy on existing federal leases within the decision area and therefore does not protect any portions of the decision area from the expected associated impacts on soils. Local soil health and characteristics within project footprints would be impacted by compaction and vegetation clearing.

#### ***Impacts from Solid Minerals***

Direct impacts, such as erosion and compaction, to soils from solid minerals management are discussed above under *Nature and Type of Effects*. Under Alternative A, 2,538 acres would be closed to salable mineral disposal (see **Table 4-25**). Management under Alternative A would allow for coal exploration and does not identify any portions of the decision area as unsuitable or unacceptable for surface mining of coal, and does not provide for withdrawing any lands from mineral entry. Alternative A therefore does not protect most of the planning area from impacts on soils associated with solid mineral extraction.

***Impacts from Mineral Split Estate***

Direct impacts on soils from mineral split estate are the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. Under Alternative A, lands where the BLM manages the subsurface mineral estate but not the surface would be administered and managed in each phase of mineral extraction to ensure that undue degradation to soil resources does not occur and that final restoration of the landscape is satisfactory to the surface landowner. Management actions would reduce the total surface disturbance and protect soils from unnecessary compaction, erosion, and vegetation loss.

**4.16.5 Alternative B*****Impacts from Travel and Transportation Management***

Direct impacts on soils from travel and transportation management are discussed above under *Nature and Type of Effects*. Management under Alternative B would provide for protection measures on PH, which would provide for fewer and more localized disturbances to soils. In PH, motorized travel would be limited to existing roads, primitive roads, and trails and construction of new routes would be limited to specified needs. Construction of new routes or the upgrade of current routes would be limited to the realignment of existing designated routes if the realignment would eliminate the need for the construction of a new road, is necessary for motorist safety, or would have a minimal impact on GRSG habitat. The construction of new roads for access to valid existing rights would be limited to a cumulative total disturbance of less than three percent of the PH area, and restricted to the minimal road standard necessary. This would reduce overall soil disturbance from construction. Travel management would provide for the evaluation of roads and areas for permanent or seasonal closures, and for the restoration of travel routes using appropriate seed mixes, and possibly transplanted sagebrush. These actions would allow soils to return, over time and through the re-establishment of vegetation, to a more natural state and would reduce site-specific erosion.

***Impacts from Recreation***

Direct impacts on soils from recreation are discussed above under *Nature and Type of Effects*. Under Alternative B, SRPs in PH would only be approved when recreation would have a neutral or beneficial effect on PH. Such restriction on recreation could reduce impacts on soils from compaction, erosion, and vegetation loss.

***Impacts from Lands and Realty***

Direct impacts on soils from lands and realty management are discussed above under *Nature and Type of Effects*. Under Alternative B, the BLM would manage PH as ROW exclusion areas for new land use authorizations, and GH as ROW avoidance areas for new land use authorizations. These actions protect a larger portion of the decision area from surface disturbing activities and therefore would be more protective of soil resources from vegetation loss, soil

compaction, and soil erosion than Alternative A, which does not provide for exclusion areas or as much acreage of avoidance areas (see **Table 4-25**).

#### ***Impacts from Range Management***

Direct impacts on soils from range management are discussed above under *Nature and Type of Effects*. Alternatives B would be similar to Alternative A with the addition of GRS habitat objectives and management considerations incorporated into all BLM AMPs within PH. Also, the option of voluntary retirement of permitted grazing uses in PH would be available. GRS habitat objectives would manage or restore PH so that at least 70 percent of the land cover provides adequate sagebrush habitat to meet GRS needs, and manage anthropogenic disturbances to cover less than three percent of the total GRS habitat which would protect soils from disturbances on 70 percent of the land cover within PH from surface disturbing activities that could result in soil compaction, soil erosion, and vegetation loss.

#### ***Impacts from Fluid Minerals***

Direct impacts on soils from fluid minerals development are discussed above under *Nature and Type of Effects*. Management under Alternative B would apply RDFs and conservation measures as COAs on existing leases in PH. These measures would include surface use restrictions on existing federal leases within PH, which would protect portions of the decision area from the soil impacts associated with oil and gas exploration, development, and production.

#### ***Impacts from Solid Minerals***

Direct impacts on soils from solid minerals management are discussed above under *Nature and Type of Effects*. Management under Alternative B would find all PH unsuitable for surface mining of coal and would allow subsurface mining only if associated facilities were located outside of PH. Under Alternative B, the BLM would also provide for withdrawing areas from mineral entry within PH, and closing PH to nonenergy mineral leases and salable mineral disposal. Closure to surface disturbing activities reduces the potential for impacts on soil resource through compaction, erosion, and contamination. The BLM would also provide for restoring salable mineral pits within PH, which would increase soil health and stability in those areas. Solid minerals management would be more protective of soils resources under Alternative B than under Alternative A, as seen in (**Table 4-25**).

#### ***Impacts from Mineral Split Estate***

Direct impacts on soils from mineral split estate would be the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. On lands where the BLM manages the surface, but not the subsurface mineral estate, appropriate fluid mineral RDFs would be applied in PH. This would protect a greater amount of soil resources from undue degradation through compaction, erosion, and vegetation loss than Alternative A.

On PH lands where the BLM manages the subsurface split estate, but not the surface, the same conservation measures applicable to solid minerals on BLM-administered lands would be applied. This includes closing PH to surface coal mining, nonenergy mineral leases, and salable mineral disposal, which would reduce the potential for soil compaction, erosion and vegetation loss.

#### **4.16.6 Alternative C**

##### ***Impacts from Travel and Transportation Management***

Direct impacts on soils from travel and transportation management are discussed above under *Nature and Type of Effects*. Management under Alternative C would provide the same measures as Alternative B in PH and GH, which would result in less disturbance to soils than under Alternative A. Management under Alternative C would also prohibit the construction of new roads within four miles of GRSG leks, would avoid new road construction where possible, and would require the mitigation of any impacts on GRSG habitat from the construction of new roads or the upgrade of existing roads by using measures that have been proven to offset GRSG habitat loss. These additional measures would further protect soils from surface-disturbing activities.

##### ***Impacts from Recreation***

Impacts on soil resources from recreation would be the same as under Alternative A.

##### ***Impacts from Lands and Realty***

Direct impacts on soils from lands and realty management are discussed above under *Nature and Type of Effects*. Under Alternative C, the BLM would manage PH and GH as ROW exclusion areas for new land use authorizations, which would reduce the potential effects of surface-disturbance on soils (see **Table 4-25**). This would protect a larger portion of the decision area from surface disturbing activities and therefore would be more protective of soil resources from vegetation loss, soil compaction, and soil erosion than Alternative A.

##### ***Impacts from Range Management***

Direct impacts on soils from range management are discussed above under *Nature and Type of Effects*. Under Alternative C livestock grazing would be removed from all allotments within PH and GH, totaling 337,165 acres and 69,408 AUMs. Management under Alternative C would provide for the opportunity for improving PH and GH through striving to attain reference state vegetation relative to the ecological site description. The lack of grazing would provide the potential for soil health to improve in areas where Rangeland Health Standards are not met due to current livestock grazing.

##### ***Impacts from Fluid Minerals***

Direct impacts on soils from fluid minerals development are discussed above under *Nature and Type of Effects*. Under Alternative C, the BLM would apply RDFs and conservation measures as COAs on existing leases in GH and PH.

These measures would include surface use restrictions on existing federal leases within PH and GH, which would protect portions of the decision area from the soil impacts associated with oil and gas exploration, development, and production.

#### ***Impacts from Solid Minerals***

Direct impacts on soils from solid minerals management are discussed above under *Nature and Type of Effects*. Under Alternative C, the BLM would find both GH and PH as unsuitable for surface mining of coal and would allow subsurface mining only if associated facilities were located outside of PH and GH. Management under Alternative C would also provide for withdrawing areas from mineral entry within PH, closing PH to nonenergy mineral leases and salable mineral disposal, which would reduce the potential for soil impacts of compaction, erosion, and contamination. Management under Alternative C would also provide for restoring salable mineral pits within PH, which would increase soils health and stability in those areas. Solid minerals management would be more protective of soils resources under Alternative C due to more land closures than under Alternative A (see **Table 4-25**).

#### ***Impacts from Mineral Split Estate***

Direct impacts on soils from mineral split estate would be the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. On lands where the BLM manages the surface, but not the subsurface mineral estate, appropriate fluid mineral RDFs would be applied in PH and GH. This would protect a greater amount of soil resources from undue degradation through compaction, erosion, and vegetation loss than Alternative A.

In PH and GH where the BLM manages the subsurface split estate, but not the surface, the same conservation measures applicable to solid minerals on BLM-administered lands would be applied. This includes closing PH and GH to surface coal mining, nonenergy mineral leases, and salable mineral disposal, which would reduce the potential for soil compaction, erosion and vegetation loss.

### **4.16.7 Alternative D**

#### ***Impacts from Travel and Transportation Management***

Direct impacts on soils from travel and transportation management are discussed above under *Nature and Type of Effects*. Management under Alternative D would be more protective of soils than Alternative A and similar to Alternative B. Management under Alternative D would result in additional closures and reclamation of roads, providing for less future disturbance and further mitigation of current disturbances of soils. Management under Alternative D would provide for, on a case-by-case basis, the reclamation of commercially or administratively used roads upon completion of site-specific projects. Roads that were user created and unauthorized would also be subject

to closure for further restoration. Within PH, roads may be evaluated for permanent or seasonal closures where off-road vehicles may be causing adverse effects.

#### ***Impacts from Recreation***

Direct impacts on soils from recreation are discussed above under *Nature and Type of Effects*. Management under Alternative D would be more protective of soils than Alternative A in that SRPs on PH would only occur if the recreation would have a neutral or beneficial effect on PH. This could result in less possible disturbance to soils and vegetation as these are key habitat features for GRSG.

#### ***Impacts from Lands and Realty***

Direct impacts on soils from lands and realty management are discussed above under *Nature and Type of Effects*. Under Alternative D, the BLM would manage PH as a ROW avoidance area for all land use authorizations (including wind energy). GH would also be managed as a ROW avoidance area for wind energy. Impacts on soil resources from construction could be reduced due to restrictions on development in ROW avoidance areas. Other ROW authorizations in GH would be authorized with appropriate mitigation and conservation measures, which would reduce the potential for effects of construction disturbances to soil resources. Management under Alternative D would provide for more protection than Alternative A.

#### ***Impacts from Range Management***

Direct impacts on soils from range management are discussed above under *Nature and Type of Effects*. Management under Alternative D would be similar to Alternative A with the additional incorporation of GRSG habitat objectives into all AMPs, and the addition of GRSG management considerations into AMPs of allotments on PH. Management under Alternative D would provide for the opportunity for improving GH and PH through striving to attain suitable GRSG seasonal habitats; therefore, soil conditions would improve in these areas.

#### ***Impacts from Fluid Minerals***

Direct impacts on soils from fluid minerals development are discussed above under *Nature and Type of Effects*. Management under Alternative D would provide greater protection of soil resources by applying conservation measures as COAs to existing leases. The conservation measures would be designed to reduce surface disturbances associated with mineral extraction, which would reduce soil compaction, soil erosion, and vegetation loss.

#### ***Impacts from Solid Minerals***

Direct impacts on soils from solid minerals management are discussed above under *Nature and Type of Effects*. As with Alternative A, management under Alternative D would manage 2,437 acres of PH and 101 acres of GH as closed to salable mineral disposal. Under Alternative D, the BLM would allow for coal exploration, does not identify any portions of the decision area as unsuitable or unacceptable for surface mining of coal, and does not provide for withdrawing

any lands from mineral entry. Alternative D provides for the restoration of salable mineral pits on PH which could locally improve soil health.

#### **Impacts from Mineral Split Estate**

Direct impacts on soils from mineral split estate are the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. As with Alternative A, Alternative D, would manage lands where the BLM manages the subsurface mineral estate, but not the surface, during each phase of mineral extraction to ensure that undue degradation does not occur and that final restoration is satisfactory to the surface landowner. Management actions would reduce the total surface disturbance and protect soils from unnecessary compaction, erosion, and vegetation loss.

## **4.17 WATER RESOURCES**

### **4.17.1 Methods and Assumptions**

#### **Indicators**

**Table 4-26**, Comparison of Water Resources Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects to water resources under each alternative.

**Table 4-26**  
**Comparison of Water Resources Indicators by Alternative**

<b>Indicator</b>	<b>Alternative</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Acres managed as ROW avoidance areas	9,708	112,341	0	233,219
Acres managed as ROW exclusion areas	0	233,219	345,560	0
Acres found unsuitable for surface coal mining	0	385,693	639,927	0
Acres closed to nonenergy leasing and salable mineral disposal	0	279,097	453,969	0
Opportunity to restore or improve water sources for GRSG and their habitat through range management	No change	Increase	Variable-see analysis	Increase
Opportunity for elimination of mosquito breeding water conditions	No change	Increase	Increase	Increase

#### **Assumptions**

The analysis includes the following assumptions:

- Projects that help restore watersheds, desirable vegetation communities, or wildlife habitats (including surface disturbance associated with these efforts) would benefit water resources over the long term;
- Currently impaired streams would remain impaired;
- The degree of impact attributed to any one disturbance or series of disturbances would be influenced by several factors, including proximity to drainages and groundwater wells, location within the watershed, time and degree of disturbance, reclamation potential of the affected area, vegetation, precipitation, and mitigating actions applied to the disturbance;
- Fuels projects as, well as planned and un-planned fire, that contribute towards establishment of a more "natural" fire regime would have long-term benefits on water quality; and
- Surface-disturbing actions related to fluid mineral development would comply with Gold Book surface operating standards (and subsequent updates).

#### **4.17.2 Nature and Type of Effects**

Management actions could change the quality and accessibility of water features. Streams surrounded by poorly functioning riparian habitat do not have sufficient vegetation cover, forb diversity, or insect life to provide quality habitat that streams with riparian habitat in PFC could. Streams with poorly functioning riparian habitats are also more susceptible to stream bank erosion and cutting, and poorer water quality due to a reduced ability to filter sediments, dissipate stream energy during high flow periods, and develop diverse ponding and channel characteristics to provide the habitat, water depth, duration, and temperature necessary for fish production, waterfowl breeding and other uses.

Management actions could also increase or decrease the ability of water sources to serve as mosquito breeding habitat, which could in turn increase or decrease, respectively, the risk of West Nile virus transmission to GRSG.

Surface water quality is influenced by both natural and human factors. Surface water quality concerns created by natural conditions are hard to control. Surface water quality impacts can result from a number of causes, including transport of eroded soils into streams due to improperly managed livestock grazing, introduction of waste matter into streams from domestic livestock, and "low-water" crossing points of roads, routes, and ways used by motorized vehicles.

Livestock can cause decreases in water quality through the trampling of soils and vegetation along and within natural water features. At the same time, water supply structures throughout the landscape that have been established for the

benefit of livestock also often provide seasonal foraging habitat (succulent forbs, grasses, and associated insects) for wildlife.

Mineral development is generally associated with the risk of impairments to local surface waters and groundwater. Mineral development disturbs soils and can result in increased erosion and contamination of waterways through runoff. Mineral development increases the presence of petroleum-using vehicles and equipment on the land, and increases the likelihood of chemical spills that can sink into the earth and contaminate groundwater. Mineral development can result in pools of standing water that can serve as mosquito breeding habitat, increasing the ability for West Nile virus to spread into a landscape otherwise not at risk to the pathogen.

Travel across land by foot, bicycle, horse or OHV results in vegetation loss and soil compaction, which can then lead to soil erosion and increased in sediment flow into waterways. Travel by vehicle also increases the presence of petroleum-using vehicles and equipment on the land, which increases the likelihood of chemical spills that could contaminate surface waters through runoff. Management approaches that designate travel to specified routes can result in more predictable, localized and manageable impacts. Selectively locating travel routes away from areas where water resources exist can minimize the extent of these effects.

Most recreation on BLM-administered lands results in vegetation loss, soil compaction, and soil erosion which can impact water resources by increasing sediment load and chemical contamination. Management approaches that direct recreation to specific areas and avoid dispersed recreation can result in more predictable, localized and manageable impacts.

Lands and realty management decisions affect where ground disturbing activities can and cannot occur. The use of ROW exclusion and ROW avoidance areas limit the amount of man-made runoff of soils and chemicals into waterways within those areas, and are generally considered to be protective of water quality. ROW exclusion and avoidance areas are also seen to reduce the likelihood of chemical spills onto the ground, which can then sink into the earth and contaminate groundwater.

Implementing management for the following resources would have negligible or no impact on water resources and are therefore not discussed in detail: fire and fuels management, and ACECs.

#### **4.17.3 Impacts Common to All Alternatives**

##### ***Impacts from Habitat Restoration and Vegetation Management***

Under all alternatives habitat restoration would occur and would be implemented based on environmental variables that indicate areas most likely to succeed in restoration and therefore benefit GRSG. Restoring habitat generally

has a beneficial effect on water quality through the reduction in runoff and sedimentation into surface waters. Restoration would include restoring streams to PFC, which would increase water quality by propagating proper channel widths, water temperatures, transportation of suspended and bedload sediments, and stream bank vegetation.

#### 4.17.4 Alternative A

**Table 4-27**, Quantitative Impact Summary by Alternative for Water Resources, provides a comparison of the quantifiable aspects of each alternative with respect to soils.

**Table 4-27**  
**Quantitative Impact Summary by Alternative for Water Resources**

<b>Resource Use</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW exclusion area (acres)	0	233,219	345,560	0
ROW avoidance area (acres)	9,708	112,341	0	233,219
Closed to livestock grazing (acres)	0	0	337,165	0
Unsuitable for surface coal mining (acres)	0	385,693	693,927	0
Closed to salable minerals (acres)	2,538	279,097	453,969	2,538
Closed to nonenergy leasing (acres)	2,538	279,097	453,969	2,538

#### ***Impacts from Travel and Transportation Management***

Direct impacts on water resources from travel and transportation management are discussed above under *Nature and Type of Effects*. Under Alternative A, motorized cross country travel would continue to be restricted to existing roads and trails throughout the project area on BLM-administered lands, which would reduce new soil disturbances and localize further disturbance to existing travel routes which would reduce the possibility of additional sediment load or chemical contamination into water resources.

#### ***Impacts from Recreation***

Direct impacts, including vegetation loss, soil compaction, and soil erosion, to water resources from recreation are discussed above under *Nature and Type of Effects*. Under Alternative A, SRPs would be evaluated on a case-by-case basis throughout the project area. Management approaches that direct recreation to specific areas and avoid dispersed recreation can result in more predictable, localized, and manageable impacts. This would result in less vegetation loss, soil

compaction, and soil erosion from recreation, which could limit sediment load into waterways and disturbance to stream banks.

#### ***Impacts from Lands and Realty***

Direct impacts on water resources from ground-disturbing activities related to ROW development are discussed above under *Nature and Type of Effects*. Alternative A has two ROW avoidance areas and no ROW exclusion areas as seen in **Table 4-27**. The ROW avoidance areas make up 9,708 acres and are comprised of the Acid Shale-Pine Forest ACEC and Judith River Canyon. Surface-disturbing activities related to ROW development would be restricted in the ROW areas, limiting impacts on water resources.

#### ***Impacts from Range Management***

Direct impacts on water resources from range development are discussed above under *Nature and Type of Effects*. Under Alternative A, stream bank riparian habitat would be improved from unsatisfactory to satisfactory conditions. BLM would maintain PFC of riparian and wetland areas through proper livestock grazing systems and methods. Water sources would be developed where needed as indicated by allotment monitoring, and waters that are adversely affected by uncontrolled livestock use would be fenced.

#### ***Impacts from Fluid Minerals***

Direct impacts, such as impairment of water quality from erosion and chemical spills, to water resources from fluid minerals development are discussed above under *Nature and Type of Effects*. It is presumed that water quality has been affected in the planning area due to fluid mineral exploration and development. It is also presumed that fluid mineral projects have resulted in standing water that has provided mosquito breeding habitat and increased the likelihood that GRSG could be infected with West Nile virus. Alternative A does not include any fluid minerals management actions for the protection of GRSG against West Nile virus.

#### ***Impacts from Solid Minerals***

Direct impacts, such as impairment of water quality from erosion and chemical spills, to water resources from solid minerals development are discussed above under *Nature and Type of Effects*. Under Alternative A, 2,538 acres are managed as closed to salable mineral disposal (**Table 4-27**). Alternative A does not include any locatable minerals management actions that would protect GRSG against West Nile virus. Management under Alternative A would allow for coal exploration and does not identify any portions of the decision area as unsuitable or unacceptable for surface mining of coal, and does not provide for the withdrawal of lands from mineral entry.

#### ***Impacts from Mineral Split Estate***

Direct impacts on water resources from mineral split estate are the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. Under Alternative A, lands where the BLM manages the subsurface

mineral estate, but not the surface, would be administered and managed in each phase of mineral extraction to ensure that undue degradation does not occur and that final restoration is satisfactory to the surface landowner. Management actions would reduce the possibility of man-made erosion, runoff and chemical contamination into surface and ground water features.

#### **4.17.5 Alternative B**

##### ***Impacts from Travel and Transportation Management***

Direct impacts on water resources from travel and transportation management are discussed above under *Nature and Type of Effects*. Management under Alternative B would provide for protection measures on PH, which would provide for fewer and more localized disturbances to water resources. In PH, motorized travel would be limited to existing roads, primitive roads, and trails and construction of new routes would be limited to specified needs. Construction of new routes or the upgrade of current routes would be limited to the realignment of existing designated routes if the realignment would eliminate the need for the construction of a new road, is necessary for motorist safety, or would have a minimal impact on GRSG habitat. The construction of new roads for access to valid existing rights would be limited to a cumulative total disturbance of less than three percent of the PH area, and restricted to the minimal road standard necessary, which would reduce overall soil disturbance from construction resulting in a reduced possibility of runoff into streams and springs. Travel management would provide for the evaluation of roads and areas for permanent or seasonal closures, and for the restoration of travel routes using appropriate seed mixes, and possibly transplanted sagebrush which could indirectly influence water quality by stabilizing soils and restoring restricted areas a natural state.

##### ***Impacts from Recreation***

Direct impacts on water resources from recreation are discussed above under *Nature and Type of Effects*. Under Alternative B, SRPs in PH would only be approved when the recreation would have a neutral or beneficial effect on PH areas. Such restriction on recreation could reduce impacts on water resources from compaction and erosion of soils, and vegetation loss.

##### ***Impacts from Lands and Realty***

Direct impacts on water resources from lands and realty management are discussed above under *Nature and Type of Effects*. Under Alternative B, the BLM would manage PH as ROW exclusion areas and GH as ROW avoidance areas for new land use authorizations. These actions protect a larger portion of the decision area from surface disturbing activities and therefore would be more protective of water resources than Alternative A (see **Table 4-27**).

***Impacts from Range Management***

Direct impacts on water resources from range development are discussed above under *Nature and Type of Effects*. Management under Alternative B would provide greater potential for improvement of water quality sources in riparian areas and wet meadows with PFC than Alternative A. Unlike Alternative A, management under Alternative B would provide the opportunity for improving PH through new water diversions from springs and seeps. Impacts from Alternative B would be of greater benefit than Alternative A through the analysis of existing water sources and the implementation of appropriate modifications to maintain the continuity of the predevelopment riparian area within PH. Management under Alternative B would provide GRSG with greater protection against West Nile virus than Alternative A through implementing RDFs when developing or modifying water developments in PH.

***Impacts from Fluid Minerals***

Direct impacts on water resources from fluid minerals development are discussed above under *Nature and Type of Effects*. Management under Alternative B would apply conservation measures to PH for fluid mineral leasing. These measures would include limitations on surface disturbances in PH, which would decrease the chance for the contamination of surface and ground waters, and would decrease the likelihood for the creation of new mosquito breeding habitat and the risk of infection of GRSG with West Nile virus in these areas.

***Impacts from Solid Minerals***

Direct impacts on water resources from solid minerals development are discussed above under *Nature and Type of Effects*. Under Alternative B, the BLM would find all PH as unsuitable for surface mining of coal and would allow subsurface mining only if associated facilities were located outside of PH. Management under Alternative B would also provide for withdrawing areas from mineral entry within PH, and would close PH to nonenergy mineral leases and salable mineral disposal. This would reduce the chance for the contamination of water resources within PH, and would reduce the chance for forming mosquito breeding habitat and furthering the potential transmission of West Nile virus to GRSG. Overall, management under Alternative B would be more protective of GRSG with respect to water quality and West Nile virus transmission than Alternative A (see **Table 4-27**).

***Impacts from Mineral Split Estate***

Direct impacts on water resources from mineral split estate would be the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. On lands where the BLM manages the surface, but not the subsurface mineral estate, appropriate fluid mineral RDFs would be applied in PH. This would protect a greater amount of water resources from manmade runoff, sedimentation and chemical contamination, and would reduce the chance for forming mosquito breeding habitat and furthering transmission of West Nile virus to GRSG.

On PH lands where the BLM manages the subsurface split estate, but not the surface, the same conservation measures applicable to solid minerals on BLM-administered lands would be applied. This includes closing PH to surface coal mining, nonenergy mineral leases and salable mineral disposal, which would reduce the potential for contamination of water resources within PH and would reduce the chance for forming mosquito breeding habitat and furthering the potential transmission of West Nile virus to GRSG.

#### **4.17.6 Alternative C**

##### ***Impacts from Travel and Transportation Management***

Direct impacts on water resources from travel and transportation management are discussed above under *Nature and Type of Effects*. Management under Alternative C would provide the same measures as Alternative B in PH and GH, which would result in fewer disturbances to water resources than under Alternative A. Under Alternative C, the BLM would also prohibit the construction of roads within four miles of GRSG leks, would avoid new road construction where possible, and would require the mitigation of any impacts on GRSG habitat from the construction of new roads or the upgrade of existing roads by using measures that have been proven to offset GRSG loss. These additional measures would further protect water resources from surface-disturbing activities.

##### ***Impacts from Recreation***

Impacts on water resources from recreation activities would be the same as under Alternative A.

##### ***Impacts from Lands and Realty***

Direct impacts on water resources from lands and realty management are discussed above under *Nature and Type of Effects*. Alternative C would manage PH and GH as ROW exclusion areas for new land use authorizations (see **Table 4-27**). This would protect a larger portion of the decision area from surface disturbing activities and therefore would be more protective of water resources than Alternative A.

##### ***Impacts from Range Management***

Direct impacts on water resources from range development are discussed above under *Nature and Type of Effects*. Alternative C would remove livestock grazing from PH and GH totaling 337,165 acres and 69,408 AUMs. This would provide the potential for improved soil and vegetative health, and would reduce the amount of fecal coliforms being generated on the landscape that could then flow into waterways, and would overall move the landscape toward more natural conditions that support clean surface waters. Alternative C would improve surface water quality over existing conditions as represented by Alternative A.

Alternative C would also provide greater potential for improvement of water quality sources than Alternative A by striving to attain reference state vegetation relative to ecological site descriptions in riparian areas and wet meadows on GH and PH. Compared with Alternative A, Alternative C may limit the BLM in its ability to improve water availability through banning the authorization of new water developments through diversions from seeps or springs in GRSG habitat. Alternative C would provide GRSG with greater protection against West Nile virus than Alternative A through implementing RDFs when developing or modifying water developments in PH.

#### ***Impacts from Fluid Minerals***

Direct impacts on water resources from fluid minerals development are discussed above under *Nature and Type of Effects*. Alternative C would apply conservation measures to both GH and PH areas for fluid mineral leasing. These measures would include surface use restrictions on existing federal leases, which would decrease the chance for the contamination of surface and ground waters and would decrease the likelihood for the creation of new mosquito breeding habitat and the risk of infection of GRSG with West Nile virus in these areas.

#### ***Impacts from Solid Minerals***

Direct impacts on water resources from solid minerals development are discussed above under *Nature and Type of Effects*. Alternative C would find all GH and PH as unsuitable for surface mining of coal and would allow subsurface mining only if associated facilities were located outside of PH. Alternative C would also provide for withdrawing areas from mineral entry within PH, and would close both GH and PH to nonenergy mineral leases and salable mineral disposal. This would reduce the chance for the contamination of water resources within PH and would reduce the chance for forming mosquito breeding habitat and furthering the potential transmission of West Nile virus to GRSG. Overall, Alternative C would be more protective with respect to water quality and West Nile virus transmission than Alternative A (see **Table 4-27**).

#### ***Impacts from Mineral Split Estate***

Direct impacts on water resources from mineral split estate would be the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. On lands where the BLM manages the surface, but not the subsurface mineral estate, appropriate fluid mineral RDFs would be applied in PH and GH. This would protect a greater amount of water resources from manmade runoff, sedimentation, and chemical contamination and would reduce the chance for forming mosquito breeding habitat and furthering transmission of West Nile virus to GRSG.

On PH and GH lands where the BLM manages the subsurface split estate, but not the surface, the same conservation measures applicable to solid minerals on BLM-administered lands would be applied. This includes closing PH and GH to surface coal mining, nonenergy mineral leases, and salable mineral disposal,

which would reduce the potential for would reduce the chance for the contamination of water resources within PH and GH, and would reduce the chance for forming mosquito breeding habitat and furthering the potential transmission of West Nile virus to GRSG.

#### **4.17.7 Alternative D**

##### ***Impacts from Travel and Transportation Management***

Direct impacts on water resources from travel and transportation management are discussed above under *Nature and Type of Effects*. Management under Alternative D would be more protective of water resources than Alternative A and similar to Alternative B. Management under Alternative D would result in additional closures and reclamation of roads, providing for less future disturbance and further mitigation of current disturbances of water resources. Management under Alternative D would provide for, on a case-by-case basis, the reclamation of commercially or administratively used roads upon completion of site-specific projects. Roads that were user created and unauthorized would also be subject to closure for further restoration. Within PH, roads may be evaluated for permanent or seasonal closures where off-road vehicles may be causing adverse effects.

##### ***Impacts from Recreation***

Direct impacts on water resources from recreation are discussed above under *Nature and Type of Effects*. Management under Alternative D would be more protective of soils than Alternative A in that SRPs on PH would only occur if the recreation would have a neutral or beneficial effect on PH areas. This would result in less disturbance GRSG habitat which would prevent impacts on water resources from runoff and stream bank erosion.

##### ***Impacts from Lands and Realty***

Direct impacts on water resources from lands and realty management are discussed above under *Nature and Type of Effects*. Under Alternative D, the BLM would manage PH as a ROW avoidance area for all land use authorizations (including wind energy). GH would also be managed as a ROW avoidance area for wind energy (see **Table 4-27**). Impacts on water resources from construction could be reduced by restricting development in ROW avoidance areas. Other ROW authorizations in GH would be authorized with appropriate mitigation and conservation measures, which would reduce the potential for effects of construction on water resources. Management under Alternative D would provide for more protection than Alternative A.

##### ***Impacts from Range Management***

Direct impacts on water resources from range development are discussed above under *Nature and Type of Effects*. Management under Alternative D would provide similar potential for improvement of water quality as Alternative A. Riparian-wetland habitats would be managed for PFC and the desired plant

community, thereby mitigating many nonpoint source pollutants. Unlike Alternative A, management under Alternative D would provide the opportunity for improving PH through new water diversions from springs and seeps. Management under Alternative D would provide GRSG with greater protection against West Nile virus than Alternative A through implementing RDFs when developing or modifying water developments in PH.

#### ***Impacts from Fluid Minerals***

Direct impacts on water resources from fluid minerals development are discussed above under *Nature and Type of Effects*. Similar to Alternative B, conservation measures would be applied to provide greater protection of GRSG from West Nile virus than Alternative A through managing water developments to reduce the spread of the virus within GRSG habitat areas, and through minimizing or avoiding surface disturbance.

#### ***Impacts from Solid Minerals***

Direct impacts on water resources from solid minerals development are discussed above under *Nature and Type of Effects*. Management under Alternative D, as with Alternative A, would manage 101 acres of PH and 2,437 acres of GH as closed to salable mineral disposal. Management under Alternative D does not include any locatable minerals management actions that would protect GRSG against West Nile virus (see **Table 4-27**). Management under Alternative D would allow for coal exploration and does not identify any portions of the decision area as unsuitable or unacceptable for surface mining of coal, and does not provide for the withdrawal of lands from mineral entry.

#### ***Impacts from Mineral Split Estate***

Direct impacts on water resources from mineral split estate would be the same as those discussed above for fluid and solid minerals under *Nature and Type of Effects*. As with Alternative A, Alternative D, would manage lands where the BLM manages the subsurface mineral estate but not the surface each phase of mineral extraction to ensure that undue degradation does not occur and that final restoration would be satisfactory to the surface landowner. Management actions would reduce the total surface disturbance and protect soils from unnecessary compaction, erosion, and vegetation loss which would protect surface waters from additional runoff and sedimentation, as well as chemicals from mineral extraction.

## **4.18 SPECIAL STATUS SPECIES – OTHER SPECIES OF ISSUE**

### **4.18.1 Methods and Assumptions**

Although data on known locations and habitats within the planning area are available, the data are neither complete nor comprehensive concerning all special status species known to occur nor potential habitat that might exist. Known and potential special status species and habitat locations were considered in the analysis; however, the potential for species to occur outside

of these areas was also considered and, as a result, some impacts are discussed in more general terms. See **Section 4.2** for a discussion of impacts on GRSG.

#### **Indicators**

**Table 4-28**, Comparison of Special Status Species-Other Species of Issue Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on special status species under each alternative.

**Table 4-28**  
**Comparison of Special Status Species-Other Species of Issue Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
ROW exclusion areas (acres)	0	233,219	345,560	0
ROW avoidance areas (acres)	9,708	112,341	0	233,219
Acres closed to livestock grazing	0	0	337,165	0
Available AUMs	69,408	69,408	0	69,408

#### **Assumptions**

The analysis includes the following assumptions:

- The travel and transportation management analysis of impacts on special status species has an assumed road width of 10 feet. This width is an overestimate for two track roads and an underestimate for two-lane roads. Additionally, the existing route data are not surface management specific, it includes all ownerships.
- The exclusion or removal of livestock in grazing allotments as proposed in Alternatives B, C, and D would eventually require the installation of fences. In the short term, reduced grazing could lead to an accumulation of fuels thus increasing the risk of fire. In the long term, more fencing would be installed within the decision area that could lead to an increase habitat fragmentation, reducing the connectivity for animal movement across the decision area and limiting access to resources.
- Direct and indirect effects of reduced ROWs for each alternative within the ROW avoidance and exclusion areas were analyzed using data from BLM-administered land only. Potential increased development of ROWs on land not administered by the BLM would increase habitat fragmentation and increase the likelihood of spreading noxious weeds in these areas.
- Impacts on special status species would be more significant than impacts on common species because population viability is already uncertain for special status species.

- Short-term effects would occur over a timeframe of two years or less and long-term effects would occur over longer than two years.

#### **4.18.2 Nature and Type of Effects**

Habitat loss, competition, predation, disease, and other factors are causes of species decline and imperilment. Habitat loss or modification due to human activity is the greatest threat to ecosystems, particularly for species adapted to specific ecological niches. BLM land management practices are intended to sustain the health, diversity, and productivity of BLM-administered lands for the use and enjoyment of present and future generations.

Impacts on special status species would primarily result from surface-disturbing activities, such as construction of roads and facilities, construction of barriers and fences, resource extraction, cross-country motorized travel, wildfires, wildfire suppression, erosion, unauthorized collection or poaching, and trampling. Direct and indirect impacts on special status species result from surface-disturbing activity that alters habitats or disruptive activities that disturb animals. Without mitigation, surface-disturbing and disruptive activities can cause the following impacts on special status species:

- Violation of the ESA, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, or applicable state laws or BLM regulations (e.g., BLM Manual 6840 and related IMs)
- Harm, harassment, or adverse effects on any federally listed threatened or endangered species or federally proposed or candidate species
- Destruction or deterioration of federally listed threatened or endangered species' or federally proposed or candidate species' habitat, migration corridors, breeding areas, or designated or proposed critical habitat
- Decreased population viability or contribution to the need for a federal listing of any federal candidate species or BLM sensitive species
- Loss of habitat function or habitat value in BLM sensitive species habitats

All federal actions would comply with ESA consultation requirements. All implementation actions would be subject to further special status species review before site-specific projects are authorized or implemented. Federal protections and BLM policy protecting threatened, endangered, and sensitive species are considered methods for reducing the potential impacts from permitted activities. If adverse impacts were identified, mitigation measures would be implemented to minimize or eliminate the impacts, or in some cases project authorization could be denied. However, even with the above administrative processes, not all impacts could be avoided.

### ***Types of Impacts—Special Status Wildlife Species***

Special status wildlife habitats on BLM-administered lands within the decision area would be affected under all alternatives, and the condition of habitats is directly linked to vegetation conditions, water quality and quantity, and progression towards land health standards (**Section 4.4** and **Section 4.17**).

The decision area provides a wide variety of habitat vegetation types for special status wildlife species across multiple ownerships (**Table 3-2** and **Table 3-3**). Nearly 170,000 acres within BLM-administered PPH or PH consists of sagebrush followed by 4,807 acres of mixed-grass prairie. In BLM PGH or GH, 44,698 acres consists of sagebrush and 8,377 acres of mixed-grass prairie. Special status species that occupy these dominant habitat types within PPH/PH and PGH/GH would be the most affected by changes to habitat caused by the following three types of disturbances: 1) disturbance from casual use; 2) disturbance from permitted activities; and 3) changes to habitat conditions.

#### *Disturbance from Casual Use*

Substantial analysis and planning is used to determine the locations and types of casual use activities that would occur, such as recreation, motorized vehicle use, and use of authorized and unauthorized routes. However, these uses are not subject to site-specific environmental review and monitoring requirements, and impacts on habitats or species would not be apparent until after change has occurred. Examples of impacts on special status wildlife from casual use include habitat modifications, fragmentation, or degradation; mortality or injury of animals; sedimentation of waterways; increased turbidity; decreased water quality; disturbance to species during sensitive or critical periods in their life cycle such as nesting or denning; short-term displacement; and long-term habitat avoidance by species that are sensitive to noise or human presence such as raptors. Some species may adapt to disturbances over time and could recolonize disturbed habitats. Conversely, changes to these habitats may promote the expansion of other species from adjacent habitats or the spread of invasive weeds. While no lands within the decision area are designated open to motorized travel, impacts would still occur in areas limited to designated routes due to noise disturbance, human presence, potential for weed spread and habitat modification, and the potential for injury or mortality to wildlife from vehicle collisions.

Both short-term loud noise (such as from vehicles or construction) and long-term low-level noise (such as from oil and gas development) have been documented to cause physiological effects on multiple wildlife species, including increased heart rate, altered metabolism, and hormones changes, foraging and antipredator behavior, reproductive success, density, and community structure (Radle 2007; Barber et al. 2009a). In addition, noise can impact wildlife species, including mammals and birds, by disrupting communication and environmental cues (FHA 2011).

Determining the effect of noise is complicated because different species and individuals have varying responses, and certain species rely more heavily on acoustical cues than others (Radle 2007; Barber et al. 2009b). Impacts would be both short term and long term, depending on the type and source of noise.

On-site management of recreation and motorized activity and designation and closure of travel routes could prevent or reduce impacts on habitat. Seasonal closure of routes would prevent impacts on species during sensitive or critical times of the year, such as during winter or birthing.

#### *Disturbance from Permitted Activities*

Permitted, surface-disturbing activities (e.g., mineral exploration and development and ROW authorizations) would result in short-term direct impacts through mortality, injury, displacement, and noise or human disturbance caused by increased vehicle traffic and use of heavy machinery. Displacement of species could increase competition for resources in adjacent habitats or promote the expansion of species from adjacent habitats. Over the long term, these activities would remove and fragment habitats due to road development and use, facility construction and placement, creation of well pads and pipelines, and construction within ROWs. Species could avoid developed areas over the long term, or may adapt and recolonize sites after construction. ROW exclusion areas would eliminate habitat impacts on BLM-administered lands from infrastructure development activities, but they could shift impacts to private lands in the same vicinity. ROW avoidance areas would concentrate infrastructure development on BLM-administered lands which would increase direct impacts from ROW developments on special status species on federal lands but could reduce indirect impacts on those species on non-BLM-administered lands.

Bird mortality and injury could occur from collision or electrocution with transmission lines and other ROW structures. Similar development in areas where there are existing ROWs would reduce impacts, since resident birds may have adapted to the existing ROWs. COAs such as requiring flight diverters or following Avian Power Line Interaction Committee guidelines would be applied to new ROW authorizations to reduce impacts. Wind energy may also cause direct impacts on birds and bats, including blade strikes, barotrauma (injury or mortality caused by rapid or excessive pressure changes), habitat loss, and displacement. Indirect impacts may include introduction of invasive vegetation that may result in altered fire cycles, degraded land health conditions and habitat fragmentation. Areas managed under NSO stipulations would limit surface disturbance and associated impacts in certain areas.

#### *Changes to Habitat Conditions*

Changes to habitat conditions could occur from vegetation and weed treatments; livestock grazing; GRSG habitat enhancements; fire; fuels treatments; and range improvements. Overall, the BLM would aim to achieve or

trend toward achieving Rangeland Health Standard 5: Biodiversity, which would maintain and/or restore habitat values for wildlife. Over the short term, vegetation, fire, and weed treatments would alter habitat for existing species, and impacts would occur until the desired habitat was established. Over the long term, vegetation and habitat treatments would increase habitat structural and compositional diversity, increase cover and nesting habitat, prevent sedimentation of waterways, and retain riparian and wetland habitats. Depending on the extent and severity, fire can improve habitat for some species in the long term.

Wildlife species that use grazing habitat can benefit from the proper management of livestock. These benefits to wildlife include providing sustainable, diverse, and vigorous mixtures of native vegetation for forage and habitat. Also, proper management of grazing livestock can control noxious weeds and reduce fuel accumulations, protect intact sagebrush habitat, and increase habitat extent and continuity (NRCS 2011). If managed improperly, overutilization of forage by livestock could occur, leading to increased competition with wildlife for forage, and potentially reduced cover and nesting habitat for other species. Livestock could also spread weeds, which would degrade habitats. Special status wildlife could be displaced from their habitats, which could increase competition for resources in adjacent habitats. Impacts would vary depending on the extent of removal, type of vegetation impacted, and length of the grazing period. In general, the more acres that are open to grazing under a given alternative, the greater the risk for impacts. Livestock may degrade riparian areas, which could impact riparian-dependent, aquatic species. The complete closure of BLM-administered lands to grazing may reduce the impacts from livestock grazing on special status species; however, this action could significantly increase fencing requirements and therefore, impacts from habitat fragmentation would also increase. Additionally, the closure of BLM-administered lands to livestock grazing could lead to an increase in livestock numbers foraging on non-BLM-administered lands thus impacting special status species on those lands.

Unplanned fire ignitions could cause short- or long-term damage to habitats depending on the vegetation type affected, extent, and severity of the fire. In the short term, fire removes forage, nesting, and habitat cover and leaves bare areas that provide little habitat value. Sagebrush destroyed by fire takes years to become reestablished and could lead to long-term reductions in available habitat for sagebrush obligate special status species. Grasses can recover more quickly from wildfire; therefore, special status species that inhabit grasslands could have an increase in available habitat in the short term.

Further, fire could displace species from suitable habitat, which could increase competition for resources in adjacent habitats. In the long term, wildland and prescribed fires, as well as fuels treatments, improve habitat by increasing structural diversity. Often, fire and fuels treatments lower the risk for an uncharacteristically large or severe wildfire that would destroy a large acreage

of wildlife habitats. For additional information on the effects of wildland fire on sagebrush habitat see **Section 4.2.2**.

Management actions that restrict surface-disturbing activities would reduce impacts such as habitat removal, fragmentation, and human disturbance. Such management actions include measures to protect GRSG; closure of areas to mineral leasing and development; ROW avoidance and exclusion areas; areas recommended for withdrawal from mineral entry; restrictions within ACECs; and route closure or restrictions.

Criteria would be used to guide land exchanges, disposals, and acquisitions, which could reduce the fragmentation of BLM-administered land in the planning area. This could improve the BLM's ability to implement management actions that would result in improved habitats, undisturbed wildlife populations, and attainment of land health standards. However, lands identified for disposal could cause fragmentation and habitat loss if the disposed land is converted to other uses, such as agriculture or residential or industrial development.

#### ***Types of Impacts—Special Status Plant Species***

The types of impacts that could occur on special status plant species include loss of vigor or reduced reproductive success, changes in habitat structure, competition, loss of pollinators or pollinator habitat, soil compaction, erosion or sedimentation, alteration of hydrologic conditions, and changes in fire regime. Together, these impacts could lead to fewer and more fragmented special status plant populations that are more at risk for extirpation due to reduced habitat quality, diminished reproductive ability, and altered plant communities. Impacts would be more likely to occur on undiscovered special status plant populations.

Two sensitive plant species are likely to inhabit the planning area, little Indian breadroot (*Pediomelum hypogaeum*) and Platte cinquefoil (*Potentilla plattensis*). Habitat for both of these herb species is very limited throughout the planning area (see **Appendix L**). Changes in management proposed under the action alternatives are not expected to impact these species; therefore, impacts on special status plants are not discussed in the impacts by alternatives below.

#### **4.18.3 Impacts Common to All Alternatives**

There are no impacts that are common to all alternatives.

#### **4.18.4 Alternative A**

##### ***Impacts from Travel and Transportation Management***

BLM-administered lands are designated limited yearlong for motorized wheeled vehicles which are restricted to existing roads and trails. The BLM would minimize or prevent road and trail development on crucial big game and upland bird habitat areas. Road and trail areas may be closed to off-road vehicles where harm to wildlife or habitat is occurring. These policies would protect special status species as described in *Nature and Type of Effects*.

Ecological impacts would likely continue from roads and motorized trails include mortality due to collisions, behavior modifications due to noise, activity or habitat loss, alteration of physical environment, leaching of nutrients, erosion, spread of invasive plants, increased use, and alteration by humans due to accessibility.

***Impacts from Recreation***

Under Alternative A, the BLM would implement limited recreation management. Recreational use may result in human disturbance, degradation of habitat, or mortality, as described in *Nature and Type of Effects*.

***Impacts from Lands and Realty***

Under Alternative A, ROWs outside of the ROW avoidance areas and WSAs are considered on a case-by-case basis. As a result, human disturbance- and infrastructure-related impacts described above in *Nature and Type of Effects* would continue. There is a current policy to collocate grants when possible. This would reduce impacts on some special status species by reducing the extent of new disturbance. A total of 9,708 acres of habitat would continue to be managed as a ROW avoidance area which would protect special status species habitat (**Table 4-29**, Non-BLM Acreage, GH, and PH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres). GH and PH ReGAP Class 3 habitat composition details including associated acreages for each alternative are described in **Section 4.1**. There would be no ROW exclusion areas within the planning area.

Land tenure adjustments would be subject to current disposal/acquisition criteria in the Headwaters Resource Management Plan (BLM 1984) and Judith Resource Area Resource Management Plan (BLM 1994). This could include retaining important wildlife habitat as well as nesting and breeding habitat for game animals which would benefit special status species. This would reduce the likelihood of habitat conversion to agriculture, urbanization, or other uses that would remove habitat.

***Impacts from Range Management***

Livestock grazing would continue to be managed through development and monitoring of AMPs, or similar grazing plans. Methods and guidelines from the Headwaters Resource Management Plan (BLM 1984) and Judith Resource Area Resource Management Plan (BLM 1994) would be followed to maintain ecological conditions, enhance vegetation production, maintain and enhance wildlife habitat, during implementation of grazing regimens. Livestock use would be adjusted by changing the kind or class of livestock, the season of use, or distribution patterns if necessary to maintain the ecological conditions objectives. Monitoring would be used to maintain the effectiveness of these practices. As discussed in the *Assumptions* section above, grazing practices could have negative, neutral or positive effects on special status species. Impacts from

**Table 4-29**  
**Non-BLM Acreage, GH, and PH within Right-of-way Avoidance and Exclusion Areas by Alternative (Acres)**

Non-BLM <sup>1</sup>		Alternative A		Alternative B			Alternative C		Alternative D	
GH	PH	Avoidance <sup>2</sup>	Neither <sup>3</sup>	Avoidance <sup>4</sup>	Exclusion <sup>5</sup>	Neither <sup>3</sup>	Exclusion <sup>6</sup>	Neither <sup>3</sup>	Avoidance <sup>7</sup>	Neither <sup>3</sup>
899,659	974,735	9,708	335,852	112,341	233,219	0	345,560	0	233,219	112,341

Source: BLM 2012a

- 1 – Non-BLM acreage includes state lands, privately owned land, and other lands not managed by BLM.
- 2 – Alternative A avoidance acreage represents existing protective habitat within BLM-administered lands.
- 3 – Represents BLM-administered lands outside of the avoidance and exclusion areas.
- 4 – Alternative B avoidance acreage is equal to GH.
- 5 – Alternative B exclusion acreage is equal to PH.
- 6 – Alternative C exclusion acreage is equal to GH + PH.
- 7 – Alternative D avoidance acreage is equal to PH.

grazing as described under *Nature and Types of Effects* would continue under Alternative A.

Riparian habitats would be managed to achieve PFC, maintain desired plant community or wildlife habitat, improve watershed conditions, and comply with the Clean Water Act. Grazing systems would consider riparian impacts, including seasonal avoidance of riparian zones, encouraging livestock to congregate away from riparian areas, or fencing-off riparian areas. Restricting livestock from riparian areas would benefit riparian vegetation health and therefore positively impact special status species.

#### ***Impacts from Fluid Minerals***

Under Alternative A, fluid mineral leasing and development would continue on previously leased lands. Development in these areas would continue to impact special status species by surface disturbance and occupancy, as described under *Nature and Type of Effects*.

#### ***Impacts from Solid Minerals***

Prior to approving coal exploration licenses or prospecting permits for nonenergy leasable minerals, project-specific environmental review would be required to assess impacts on resources and develop mitigation measures. Surface occupancy is generally prohibited within key wildlife areas, floodplains and ROWs. No known coal resources are located in the management area. Therefore, no impacts are expected from coal.

For locatable minerals, mitigation measures to prevent unnecessary degradation would apply to the proposed Plan of Operations. The BLM would review these plans in withdrawn areas and would consider purchasing claims where activities threaten resource values, such as special status species and their habitat. Prospecting permits would be issued for nonenergy leasable minerals after environmental review of impacts and development of mitigation measures. Salable minerals contracts would be issued where disposal is deemed to be in the public interest while providing for reclamation of mined lands and preventing unnecessary impacts on nonmineral resources. Solid minerals management could improve other special status species habitat in the decision area. Impacts from surface disturbance and changes in habitat, as described under *Nature and Type of Effects*, would continue.

#### ***Impacts from Fire and Fuels Management***

Prescribed burning may be used in support of resource management objectives, such as restoring grassland or shrubland, reducing conifer encroachment, or increasing age-class variety. The intention of prescribed burning is to improve wildlife habitat and vegetation production. Sagebrush treatments would be designed to maintain sagebrush within the canopy at 15 to 50 percent and to increase succulent forbs.

Chemical weed treatments (herbicide) may also be applied following prescribed burns to limit the expansion of weeds or invasive species in the burned area. A minimum rest period from livestock grazing of two growing seasons would be required after major vegetative disturbance, such as re-seeding. Rest periods following wildfire or controlled burn would be determined on a site-specific basis.

Intensive wildfire suppression would be applied to high-value areas, such as sagebrush areas, fire-sensitive woody riparian areas, and commercial forests. Current fire management practices within the decision area would not reduce impacts on special status species as described under *Nature and Type of Effects*. In some instances, habitat for some special status species would be lost to fire, while other habitats would be protected from fuels management.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Grazing methods, land treatments and other improvements would be designed to accomplish habitat restoration objectives. Surface-disturbing activities greater than 0.25 acre require rehabilitation. Normally, native species would be used for re-seeding surface disturbances, unless nonnative species would better provide habitat stabilization. The BLM would manage for the benefit of succulent vegetation, forbs, and maintenance of big and silver sage in GRSG habitat areas. These improvements would also affect special status species associated with sagebrush ecosystems. Sagebrush obligate populations would trend upward in the long term, while special status grassland species would likely decline.

#### ***Impacts from ACECs***

Under Alternative A, the BLM would not designate any additional ACECs and therefore would not provide additional protection to other special status species' habitats through ACEC management.

### **4.18.5 Alternative B**

#### ***Impacts from Travel and Transportation Management***

Actions to limit motorized vehicles to existing roads and trails would continue until travel management planning is completed. Planning would evaluate roads in PH for permanent or seasonal closure. Route construction in PH would be limited to realignments of existing roads or would be built or upgraded to minimum standards necessary. This would reduce impacts from disturbance, habitat changes, and mortality on other special status species in these areas. The surface disturbance to vegetation associated with road-building would be part of the three percent maximum disturbance for that area. If closures were applied, the impacts from roads on special status species described in the *Nature and Type of Effects* section would be reduced in these areas.

#### ***Impacts from Recreation***

To protect GRSG, SRPs would be issued in PH only where the effects of the recreational use were neutral or beneficial to GRSG habitat. This action would

reduce impacts, such as human disturbance, degradation of habitat, or mortality, from recreation as described under the *Nature and Type of Effects* for special status species that occur in PH.

***Impacts from Lands and Realty***

ROW exclusion areas (233,219 acres) for PH would be established and could reduce impacts from disturbance and habitat changes as described under *Nature and Type of Effects* for other special status species that occur in these areas (**Table 3-2**). Additionally, ROW avoidance areas (112,341 acres) would be included for GH under Alternative B (**Table 4-29**). See **Table 3-3** for a description of vegetation types within PGH that would be included as ROW avoidance areas. However, due to the large aerial extent and variety of ownerships (non-BLM) within PH (974,735 acres) and GH (899,659 acres), impacts from development on other special status species would still continue to occur on lands outside of BLM jurisdiction.

Public ownership would be retained in PH, with exceptions for increasing contiguous federal ownership patterns within PH, and in areas with effective mitigation or conservation easement for disposal of federal land. State or private lands may be acquired to enhance GRSG conservation value of existing federal lands. Ownership changes might positively or negatively impact special status species, depending on the proposed use of the land, as described under *Nature and Type of Effects*.

***Impacts from Range Management***

Under Alternative B, the number of acres open or closed for grazing and available AUMs would be the same as Alternative A. Impacts from grazing as described under *Nature and Types of Effects* would occur, including changes to habitat conditions.

Permit renewals and AMPs would be used to incorporate GRSG management objectives into grazing allotments. NEPA analysis of grazing permit renewals would include specific objectives to restore and improve GRSG habitat, and include an alternative that achieves this objective. Planning efforts would identify allotments where retirement of permitted grazing uses is potentially beneficial to special status species habitat.

In PH, management would promote vegetation composition and structure consistent with GRSG habitat objectives. Grazing management actions, such as numbers or type of livestock, season of use or distribution may be considered to meet GRSG habitat objectives. Following drought periods, PH areas would be managed to allow for vegetation recovery. Wet meadows and riparian areas in PH would be managed to maintain forbs, edge cover, and species richness to facilitate GRSG brood rearing. Seasonal restrictions on livestock grazing would be used to reduce pressure on riparian vegetation used by GRSG in summer. Modifications to water developments would be considered to maintain

continuity of riparian areas within PH. This management could benefit other special status species that depend on these habitats.

Vegetation treatments to increase forage for livestock would only be allowed in PH if they conserve or enhance GRSG habitat. Structural range improvements would be designed to improve GRSG habitat through improved grazing management. Existing structural range improvements (e.g., fences) would be modified to minimize strikes on GRSG. Existing improvements and project planning for new improvements would reduce impacts described under *Nature and Type of Effects* for other special status species that occur in these areas. However, sensitive grassland species may have reduced habitat as a result of GRSG habitat enhancements.

#### ***Impacts from Fluid Minerals***

The BLM would implement limitations on exploration within PH, which would reduce impacts on special status species and their habitats from exploration and development of fluid minerals (i.e., mortality, injury, displacement, noise or human disturbance, and habitat loss and fragmentation). RDFs and conservation measures would be applied as COAs on existing federal leases, limiting surface occupancy within PH, imposing seasonal restrictions, and restricting surface disturbance to three percent of the area.

#### ***Impacts from Solid Minerals***

All surface mining of coal would be found to be unsuitable in PH. Subsurface leases would be allowed if all surface facilities were placed outside PH. In existing lease areas, surface facilities would be located outside PH, or collocated in existing disturbed areas to the extent possible. In GH, surface disturbances would be minimized during activity level planning. Currently there is no coal potential in the management area. Therefore, no impacts are expected from coal.

For locatable minerals, areas in PH would be proposed for withdrawal from mineral entry based on risk to GRSG habitat. Existing claims would be subject to validity examination or buyout, mitigation would be applied to claims, and BMPs would be applied as conditions of approval.

PH would be closed to nonenergy leasable mineral leasing and to salable mineral disposal. BMPs would be applied to existing leases and restoration to any existing salable mineral pits. These proposed limitations would minimize impacts from surface disturbance and changes in habitat, as described under *Nature and Type of Effects* for other special status species that occur in these areas.

#### ***Impacts from Fire and Fuels Management***

The approach to prescribed burning would be as described under Alternative A. Fuels treatments would be designed and implemented with an emphasis on promoting sagebrush. Sagebrush canopy would not be reduced below 15 percent unless required for fuels management objectives, and seasonal

restrictions would be applied to fuels management. Rest periods would be required and invasive species controlled, with native seeds utilized for treatment wherever possible, including for emergency stabilization projects. Climate change potential would be considered in selection of seeding for restoration. Grazing livestock would be considered as an option to reduce fuel load.

Fire suppression would prioritize GRSG habitat in PH and GH, after life and property, and BMPs would be followed. These restrictions would minimize impacts described under *Nature and Type of Effects* for other special status species that occur in these habitats. Together these actions would reduce the effects from wildfire. However, suppression over large areas could allow for fuels to build up and could lead to a large-scale fire over the long term.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Within the analysis area, vegetation treatments would continue to be used to achieve resource management objectives and considered for the protection of sagebrush ecosystems. Implementation of restoration efforts would be prioritized based on the proposed benefit to GRSG. Habitat restoration would attempt to meet GRSG habitat parameters as the highest priority. Native seed would be used for restoration unless precluded; climate change potential would be considered in selection of seeding for restoration. Sagebrush seed harvest areas may be established in areas prone to fire. Vegetation treatments and sagebrush ecosystem restoration efforts would minimize impacts on special status species in these areas as described under *Nature and Type of Effects*. This would improve habitat for other special status species that use the same habitat as GRSG.

#### ***Impacts from ACECs***

Impacts would be the same as under Alternative A.

### **4.18.6 Alternative C**

#### ***Impacts from Travel and Transportation Management***

New road construction would be prohibited within four miles of active leks and avoided in PH and GH. Road construction would be limited to realignments of existing routes in PH, if the realignment has minimal impact on GRSG habitat. No upgrading (e.g., paving of primitive roads) of existing routes would be allowed unless necessary for safety or to avoid construction of a new road. When roads or trails are closed, re-seeding would be done with native seed mixes and transplanted sagebrush would be required. All additional impacts would be the same as under Alternative B. Prohibiting or limiting road construction in the decision area would minimize impacts on special status species in these areas as described under *Nature and Type of Effects*.

#### ***Impacts from Recreation***

As under Alternative A, the BLM would continue to manage the area for dispersed recreation opportunities, such as hunting, camping, biking, and hiking;

therefore, no protection would be provided to other special status species' habitats. Impacts would be similar to Alternative A.

***Impacts from Lands and Realty***

PH would be ROW exclusion areas (345,560 acres). No ROW avoidance areas would be established. Designation of PH and GH as a ROW exclusion area would improve protection of other special status species on BLM-administered lands from disturbance and habitat loss, as described under *Nature and Type of Effects*. Because of the current ownership patterns in PH (974,735 acres), the ROW exclusion areas proposed under Alternative C could increase habitat fragmentation on land not administered by the BLM. See **Tables 3-2** and **3-3** for a description of vegetation types in PH and GH that would be designated ROW exclusion and avoidance areas respectively.

As under Alternative B, public ownership would be maintained in PH, but without the exceptions provided under that alternative. Private lands, when offered, may be acquired in ACECs to enhance GRSG conservation value of existing lands. Adding lands to ACECs would enhance protection of special status species in these areas.

***Impacts from Range Management***

Under Alternative C, 337,165 acres of grazing lands would be removed within PH and GH, and would include the removal of 69,408 AUMs. This action would likely reduce the impacts from grazing as stated under the *Nature and Type of Effects* section. However, grazing practices contribute to noxious weed control efforts and grazing reduces fuels. Therefore, removing grazing could allow for noxious weeds to spread and fuels to accumulate, leading to an increase in wildfire risk in special status species habitat. Unplanned fire ignitions could lead to long-term reductions in the availability of sagebrush habitat. This could lead to a short-term increase in habitat for grassland special status species, including Sprague's pipit, as described in *Nature and Type of Effects*. For a detailed list of species associated with sagebrush or grasslands habitat refer to **Appendix L**.

In addition, not allowing grazing on BLM-administered lands could substantially increase fencing to avoid trespassing from private lands onto BLM-administered lands. This would result in over 3,400 miles of fencing and would both increase and decrease habitat quality described above. However, it would further fragment the landscape.

An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses in the planning area, including development. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for special status species that inhabit rangeland outside of BLM-administered lands.

The complete exclusion of grazing from PH and GH would also eliminate the need for maintaining nearly 90 percent of stock water in the long term. A minimum amount of stock water ponds would be maintained for other wildlife management on BLM-administered lands in the planning area. Special status amphibians, shorebirds and waterfowl, and aquatic invertebrates that depend on stock water would decrease. However, the substantial reduction in stock water in GRSG habitat on BLM-administered lands under Alternative C would likely decrease the risk of mosquito-borne diseases. Stock water on land not administered by the BLMs would still be maintained.

Wet meadows and riparian areas in PH would be managed similarly to Alternative B but include maintaining productivity to facilitate GRSG brood rearing. At least six inches of stubble height would remain on herbaceous cover at all times. No new water diversions from seeps or springs would be permitted within GRSG habitat. Modifications to water developments, including dismantling, would be considered to maintain continuity of riparian areas within GRSG habitat. This management could benefit other special status species habitat. However, dismantling of human modifications within PH could remove man-made wetlands and riparian areas. Water developments in PH would use BMPs to mitigate potential impacts from West Nile virus.

Treatments would only be allowed in PH if they demonstrably benefit GRSG habitat. Existing seedings in PH that are primarily introduced grasses would be considered for restoration to sagebrush. Treatment plans must include pre-treatment data, nongrazing enclosures, and long-term monitoring. Soil cover and native herbaceous cover would be maintained in GRSG habitat. This management could benefit other special status species habitat.

Existing structural range improvements (e.g., fences) would be evaluated to ensure they conserve, enhance or restore GRSG habitat. Fences may be modified or removed to minimize strikes on GRSG. Existing improvements and project planning for new improvements would consider the potential for invasive species. The potential range management actions proposed in Alternative C would decrease the impacts described under *Nature and Type of Effects* for special status species in these areas.

#### ***Impacts from Fluid Minerals***

Exploration within PH would be permitted to obtain information for adjacent areas. Only helicopter-portable drilling methods would be allowed for geophysical operations in PH, according to seasonal timing restrictions. No exploration would be conducted in habitat areas during their season of use by GRSG. As under Alternative B, RDFs and conservation measures would be applied as COAs on existing federal leases, limiting surface occupancy within PH and GH, imposing seasonal restrictions to exploratory drilling, including vehicle traffic and other human activity, restricting surface disturbance to three percent of the area, and making BMPs mandatory as COA.

***Impacts from Solid Minerals***

Impacts from all actions on other special status species would be as described under Alternative B.

***Impacts from Fire and Fuels Management***

Land treatments within the decision area may be used in support of resource management objectives, given special consideration for the protection and maintenance of sagebrush ecosystems. Fuels treatments would be designed and implemented with an emphasis on promoting sagebrush ecosystems. Sagebrush canopy would not be reduced below 15 percent unless fuels management objectives required it, and seasonal restrictions would be applied to fuels management. Evaluate the benefits of the fuel break in the NEPA process versus the additional loss of sagebrush cover. These treatments could benefit special status species habitat.

Fuels treatments would not be allowed in winter range unless the treatment is designed to reduce wildfire risk and maintain habitat quality in the winter range. Establishing proper fire control lines and adequate preparation would be used in any fuel reduction project. Vegetation treatment plans would include pretreatment data, nongrazing exclosures, and long-term monitoring. These treatments could benefit special status species habitat.

The approach for fire suppression and emergency stabilization projects would be as described under Alternative B. Additional policies make efforts to assure availability of native seed, to establish grazing exclosures where possible to assess recovery post-fire, and exclude livestock from burned areas until GRSG habitat objectives are met. These restrictions would minimize impacts described under *Nature and Type of Effects* for other special status species that occur in these areas. While this would reduce the likelihood of impacts from livestock on habitat and species, it could also allow for fuels to build up and could increase the likelihood of a large fire that would destroy special status species habitat.

***Impacts from Habitat Restoration and Vegetation Management***

The approach is as described under Alternative B, with additional measures to prioritize restoration in seasonal habitats thought to be limiting GRSG and where factors causing degradation (e.g., livestock management) have already been addressed. In addition, native vegetation community composition and function would specifically provide for recovering GRSG habitat. Existing areas of exotic plant seedings would be interseeded and restored to recover sagebrush in order to expand occupied habitat. Vegetation treatments and sagebrush ecosystem restoration would minimize impacts on special status species that occupy these areas, as described under *Nature and Type of Effects*. As a result, a greater area of habitat would be improved for some special status species.

#### ***Impacts from ACECs***

ACECs to protect GRSG would be designated as sagebrush reserves on 97,762 acres. Vegetation within areas designated as ACECs would benefit from increased management attention to environmental resources in these areas.

#### **4.18.7 Alternative D**

##### ***Impacts from Travel and Transportation Management***

In addition to measures described under Alternative A, a travel management plan would be developed and would designate public roads and trails. Roads in PH would be evaluated for permanent or seasonal closure. Upon completion of projects, site-specific roads would be reclaimed unless the route provided specific public access benefits. Route construction would be limited to realignments that have minimal impact, as described under Alternatives B and C. Upgrading of existing roads would be allowed when there is minimal impact on GRSG habitat. Restoration of roads not designated in travel management plans would occur as described under Alternative B. Prohibiting or limiting road construction in the decision area would minimize direct and indirect impacts on special status species in these areas as described under *Nature and Type of Effects*.

##### ***Impacts from Recreation***

Impacts would be the same as under Alternative B.

##### ***Impacts from Lands and Realty***

PH would be ROW avoidance areas (233,219 acres), and PH and GH would be ROW avoidance areas for wind energy development. New authorizations would be collocated within existing disturbance areas or where impacts on GRSG and habitat are minimized. Authorizations would be allowed in GH with appropriate mitigation measures. These measures could offer an increased level of protection from disturbance and habitat loss than Alternative A.

Retired ROWs would be reclaimed by restoring habitat, which would benefit special status species and their habitat. Power lines would be removed or buried where feasible within PH, but this would be on a very limited basis. Burying power lines would cause short-term surface disturbances but would reduce long-term impacts for other special status species. Leases and permits for agricultural and other uses would be considered on a case-by-case basis, with PH a ROW avoidance area. In GH leases would be allowed with appropriate mitigation measures.

Public land withdrawals would not be recommended within habitat areas unless land management would include GRSG conservation measures. Public ownership would be maintained in PH, except where land exchange would provide a greater benefit to GRSG. Ownership changes would reduce impacts described under *Nature and Type of Effects* for other special status species that occur in these areas.

### ***Impacts from Range Management***

Within PH, the BLM would conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. State objectives would be used for fine-scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS. This management action could benefit other special status species that occupy GRSG habitat.

Under Alternative D, there would be no change to the acreage open for grazing or available AUMs: currently, 337,165 acres in the decision area are open for livestock grazing, with 69,408 available for AUMs. Impacts from grazing on habitat are described under *Nature and Type of Effects*.

Integrated ranch planning and land health assessments would be used as described under Alternative B. Allotments that have the best opportunities for GRSG habitat conservation, enhancement, or restoration would be high priorities for evaluation and management. Lands would be managed for vegetation composition consistent with ecological potential to achieve GRSG habitat objectives. If an effective grazing system meeting GRSG habitat objectives is not in place, the permit renewal process would examine at least one alternative to restore this habitat. This management could benefit other special status species that occupy GRSG habitat. Drought issues would continue to be managed under Montana/Dakotas drought policy (**Appendix I**).

Wet meadows and riparian areas in PH would be managed to maintain forbs, edge cover, and species richness to facilitate GRSG brood rearing. Seasonal restrictions on livestock grazing would be used to reduce pressure on riparian vegetation used by GRSG in summer. New water diversions from seeps or springs would be authorized only when PH would benefit from the development. Modifications to water developments would be considered to maintain continuity of riparian areas within PH. Reservoirs and stock ponds with riparian and wetland characteristics would be managed to support wildlife to the extent possible, with consideration given to the original purpose of the development. This management could benefit other special status species that occupy wet meadow and riparian habitat.

Vegetation treatments to increase forage for livestock would prioritize restoration of sagebrush steppe as budgets allow; sagebrush treatments would be justified for GRSG or other sensitive species and would be analyzed in subsequent NEPA documents. Vegetation treatments to increase forage for livestock would only be allowed in PH if they conserve or enhance GRSG habitat. Allowances would be made for treatments with negative short-term effects but overall long-term benefits.

Existing seedlings in PH that are primarily introduced grasses would be considered for restoration to sagebrush, as described under Alternatives B and C. Appropriate monitoring would be established to evaluate success of the treatments. Structural range improvements would be designed to improve GRSG habitat as described under Alternative B.

***Impacts from Fluid Minerals***

As under Alternative B, conservation measures would be applied as COAs on existing federal leases. The conditions would minimize noise, traffic, and other disturbance associated with mineral extraction. These measures would likely result in minor impacts on special status species, compared to Alternative A.

***Impacts from Solid Minerals***

The planning area would be available for coal exploration licensing; prior to licensing environmental review would be conducted to assess impacts and develop mitigation measures. Currently, there is no coal potential in the planning area. Therefore, no impacts are expected from coal.

Locatable minerals development would be managed as described under Alternative A. Prospecting for nonenergy leasable minerals would be permitted after appropriate environmental review with assessment of impacts and mitigation. Mineral pits would be restored as described under Alternative B. These actions would have minimal impacts on special status species.

***Impacts from Fire and Fuels Management***

Fuels management would be designed and implemented as described in Alternative C, but would also include additional specific parameters governing selection of sites for prescribed burns. Invasive vegetation would be monitored and controlled post-burn, and livestock grazing deferral evaluated on a case-by-case basis.

Fire suppression would be prioritized, BMPs applied, ES&R procedures would be as described in Alternative B. Additional provisions would be implemented to protect vegetation to benefit GRSG in fire-prone areas. Together these actions would reduce the effects from wildland fire. However, suppression over large areas could allow for fuels to build up and could lead to a large fire in the long term. For fuels management, livestock grazing would be considered for fuel reduction efforts as described under Alternative B. These actions would minimize impacts on other special status species that occupy GRSG habitat.

***Impacts from Habitat Restoration and Vegetation Management***

As described under Alternative B, habitat restoration would give special emphasis to protection of sagebrush ecosystems in designing vegetation treatments. Prioritization would occur as described under Alternative B, with emphasis given to other sensitive and listed species in addition to GRSG. Restoration projects would strive to meet GRSG habitat objectives for projects in PH, but those objectives would not be the highest priority as under

Alternatives B and C. Restoration design seed mixes, landscape patterns and changes to grazing would be as described under Alternative B. However, this alternative includes management direction that other restoration projects may take precedence over sagebrush projects based on funding requirements, landowner cooperation, future ESA listings, and other factors. These actions would minimize impacts on other special status species, as described under *Nature and Type of Effects*, and would provide more protection for special status species and GRSG, compared to Alternatives B and C.

***Impacts from ACECs***

Impacts would be the same as under Alternative A.

**4.19 FISH AND WILDLIFE**

**4.19.1 Methods and Assumptions**

***Methods of Analysis***

Impacts on wildlife and their habitats include the following:

- Disturbance or changes to plant communities, food supplies, cover, breeding sites, and other habitat components necessary for any species to a degree that would lead to substantial population changes.
- Disturbance or changes in seasonally important habitat (e.g., critical for overwintering or successful breeding) to a degree that would lead to substantial population changes.
- Interference with a species movement pattern that decreases the ability of a species to breed or overwinter successfully to a degree that would lead to substantial population changes.

Impacts specific to aquatic species and their habitats include the following:

- Sediment and Turbidity. Increased sediment loading in waters containing sediment-intolerant species, loss of recruitment, stress, habitat alteration, and habitat loss.
- Habitat Alteration. Changes in habitat that make it nonfunctional for select species or more conducive to competitive species.
- Loss or Reduction of Streamside Vegetation and Cover. Increased temperatures, stress, reduced productivity, and impacts on food webs.
- Water Quality Alteration. Actions that alter important water quality parameters, including pH, dissolved oxygen, temperature, hardness, alkalinity/salinity, and turbidity.

- Water Depletions. Loss of physical habitat, changes in water quality, sediment accumulation, habitat alteration, loss of habitat complexity, or food source reduction.
- Potential direct mortalities to aquatic wildlife from motorized travel.

### **Indicators**

**Table 4-30**, Comparison of Wildlife Species Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on wildlife species under each alternative.

**Table 4-30**  
**Comparison of Wildlife Species Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
ROW exclusion areas (acres)	0	233,219	345,560	0
ROW avoidance areas (acres)	9,708	112,341	0	233,219
Acres closed to livestock grazing	0	0	337,165	0
Available AUMs	69,408	69,408	0	69,408

### **Assumptions**

The analysis includes the following assumptions:

- The travel and transportation management analysis of impacts on wildlife species has an assumed road width of 10 feet. This width is an overestimate for two track roads and an underestimate for two-lane roads. Additionally, the existing route data are not surface management specific, it includes all ownerships.
- The exclusion or removal of livestock in grazing allotments would eventually require that fences be installed. In the short term, reduced grazing could lead to an increase in fire issues. In the long term, more fencing could be installed within the decision area that could lead to an increase habitat fragmentation, reducing the connectivity for animal movement across the decision area and limiting access to resources. Alternative C could result in the greatest increase in fencing in order to exclude both PH and GH from grazing.
- Direct and indirect effects of reduced ROWs for each alternative within the avoidance and exclusion areas were analyzed using data from BLM-administered land only. Potential development of ROWs on land not administered by the BLM would increase habitat fragmentation and increase the likelihood of spreading noxious weeds in these areas.

- Short-term effects would occur over a timeframe of two years or less and long-term effects would occur over longer than two years.

#### 4.19.2 Nature and Type of Effects

As discussed in **Section 3.20**, implementation of any of the alternatives would result in general and unquantifiable indirect beneficial effects for fish in terms of greater protection through new restrictions on surface and resource use resulting in reduced opportunities for surface disturbance or habitat disruption where they exist. Therefore, general fish species will not be discussed further in **Chapter 4**.

Similar to **Section 4.18**, Special Status Species – Other Species of Issue, wildlife habitats on BLM-administered lands would be affected under all alternatives within the decision area. The condition of habitats is directly linked to vegetation conditions, water quality and quantity, and progression towards land health standards (see **Sections 4.1** and **Section 4.17**).

Changes to wildlife and their habitats would be caused by the following three types of disturbances: 1) disturbance from casual use; 2) disturbance from permitted activities; and 3) changes to habitat conditions. Detailed descriptions of each disturbance type are provided in **Section 4.18.2**, Nature and Type of Effects. General impacts on wildlife are provided for each disturbance type below.

##### *Disturbance from Casual Use*

Casual use activities are not subject to site-specific environmental review and monitoring requirements, and impacts on habitats or species would not be apparent until after damage has occurred. Wildlife impacts from casual use include habitat loss, fragmentation, or degradation; mortality or injury of animals; sedimentation of waterways; increased turbidity; decreased water quality; disturbance to species during sensitive or critical periods in their life cycle such as spawning, nesting, or denning; short-term displacement; and long-term habitat avoidance by species that are sensitive to noise or human presence such as raptors.

Noise affects many wildlife species physiologically in a variety of ways, as described in **Section 4.18.2**. Generally, noise impacts would be both short term and long term, depending on the type and source.

Some species may adapt to disturbances over time and could recolonize disturbed habitats. While no lands within the decision area are designated open to motorized travel, impacts would still occur in areas limited to designated routes due to noise disturbance, human presence, potential for weed spread and habitat degradation, and the potential for injury or mortality to wildlife from vehicle collisions. On-site management of recreation and motorized activity and designation and closure of travel routes could prevent or reduce impacts.

Seasonal closure of routes would prevent impacts on species during sensitive or critical times of the year, such as during winter or birthing.

*Disturbance from Permitted Activities*

Impacts from permitted, surface-disturbing activities, as described in **Section 4.18.2**, would result in short-term direct impacts on wildlife through mortality, injury, displacement, and human disturbance. Long-term impacts would remove and fragment habitats due to the development and use of human infrastructure and development. Species could avoid developed areas over the long term or may adapt and recolonize sites after construction. ROW avoidance and exclusion areas would reduce or avoid habitat impacts and could reduce the total acreage of habitat disturbance and fragmentation.

*Changes to Habitat Conditions*

Wildlife could be impacted from changes to habitat from treatments or enhancement, changes in livestock grazing, and range improvements. The BLM would aim to achieve or trend toward achieving Rangeland Health Standard 5: Biodiversity, which would maintain or restore habitat values for wildlife. See **Section 4.18.2** for general short-term and long-term descriptions of potential impacts on wildlife habitat from grazing, fire and fire treatment, and modifications to the management of surface-disturbing activities.

**4.19.3 Impacts Common to All Alternatives**

There are no impacts that are common to all alternatives.

**4.19.4 Alternative A**

***Impacts from Travel and Transportation Management***

Management would protect habitat and reduce impacts on wildlife species, similar to the affects described in **Section 4.18.4**, Alternative A. In addition to these effects, the BLM would minimize or prevent road and trail development on crucial big game and upland bird habitat under this alternative. Roads and trails may be closed to OHVs where wildlife or habitat is being harmed.

***Impacts from Recreation***

The BLM would continue managing for dispersed recreation under Alternative A. Recreational use may result in human disturbance, degradation of habitat, or mortality, as described in *Nature and Type of Effects*.

***Impacts from Lands and Realty***

Habitat loss and human-related disturbance effects on wildlife from development in ROWs are similar to **Section 4.18.4**, Alternative A.

***Impacts from Range Management***

Livestock grazing could have negative, neutral, or positive effects on wildlife species, as discussed in the *Assumptions* section above. Effects on wildlife from current grazing practices would continue, as described in **Section 4.18.4**.

Management goals within riparian habitats would be set to achieve PFC, to maintain desired plant community or wildlife habitat, to improve watershed conditions, and to comply with the Clean Water Act. Grazing systems would consider riparian impacts, including seasonal avoidance of riparian zones, encouraging livestock to congregate away from riparian areas, or fencing-off riparian areas. Restricting livestock from riparian areas would improve riparian vegetation health and would therefore provide more suitable habitat for wildlife species.

#### ***Impacts from Fluid Minerals***

Fluid mineral leasing and development would continue on previously leased lands and would continue to affect wildlife, as described under **Section 4.18.4**.

#### ***Impacts from Solid Minerals***

There are no known coal resources in the planning area, so there would be no impacts from coal development. Surface occupancy is generally prohibited within key wildlife areas, floodplains, and public ROWs. Solid minerals management could improve habitat in the decision area, as described in **Section 4.18.4**.

#### ***Impacts from Fire and Fuels Management***

Current fire management and suppression within the decision area would likely reduce effects on wildlife, in ways similar to the impacts described in **Section 4.18.4**.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Management to improve succulent vegetation, forbs, and big and silver sage maintenance in GRSG habitat areas would increase habitat availability for sagebrush obligate species. However, these improvements would reduce habitat for grassland species.

#### ***Impacts from ACECs***

No additional ACECs would be designated under Alternative A, so no additional protection for wildlife habitats would occur.

### **4.19.5 Alternative B**

#### ***Impacts from Travel and Transportation Management***

Motorized vehicles would continue to be limited to existing roads and trails until travel management planning is completed. Roads in PH would be evaluated for permanent or seasonal closure. Route construction in PH would be limited to realignments of existing roads, built or upgraded to minimum standards necessary. Approximately 12,937 acres of overlapping wildlife habitat for a number of big game including deer, elk, antelope, big horn sheep, and moose as well as upland species including Hungarian partridge, pheasant, other grouse species inhabit the proposed PH. An additional 3,839 acres of winter range habitat for big game species would be included in the proposed PH. GH include 11,520 acres of wildlife habitat and 2,878 acres of winter habitat. Surface

disturbances to vegetation associated with road-building would be part of the three percent maximum disturbance cap for that area. Road closures would reduce the impacts on wildlife species described in **Section 4.18.2**.

#### ***Impacts from Recreation***

SRPs would be issued in PH only where the effects of the recreational use were neutral or beneficial to GRSG habitat. This action would reduce impacts from recreation as described in **Section 4.18.2** for those wildlife species that inhabit PH.

#### ***Impacts from Lands and Realty***

PH would be managed as ROW exclusion areas (233,219 acres). These areas would reduce impacts described in **Section 4.18.2** for those wildlife species that occupy these areas.

Ownership changes described in **Section 4.18.5**, Alternative B, could improve or degrade wildlife species and habitat, depending on the proposed use of the land.

#### ***Impacts from Range Management***

Under Alternative B, the number of acres open and closed for grazing and available AUMs would be the same as Alternative A. Impacts from grazing described in **Section 4.18.2** would continue under Alternative B. Existing improvements and project planning for new range improvements would reduce impacts described under *Nature and Type of Effects* for those wildlife species that inhabit rangeland. Enhancement to increase GRSG habitat may increase available habitat for sagebrush obligates but reduce habitat for grassland species.

#### ***Impacts from Fluid Minerals***

Limitations on exploration within PH would reduce impacts on wildlife species and their habitats, as described in **Section 4.18.5**. RDFs and conservation measures would be applied as COAs to existing fluid mineral leases within PH, restricting surface occupancy, imposing seasonal restrictions, and restricting surface disturbance to three percent of the area.

#### ***Impacts from Solid Minerals***

Currently there is no coal potential in the management area, so there would be no impacts from coal development. PH would be closed to nonenergy leasable minerals and to salable mineral disposal. BMPs would be applied to existing leases, and existing salable mineral pits would be restored. Together, these proposed limitations on solid mineral development would minimize the impacts described in **Section 4.18.2** for those wildlife species that occupy these areas.

#### ***Impacts from Fire and Fuels Management***

Under Alternative B, fire and fuels treatments would be managed, as described under Alternative A. Fire suppression would prioritize GRSG habitat in PH and GH, after life and property, and BMPs would be followed. These actions would

minimize impacts described in **Section 4.18.2** for those wildlife species that inhabit PH and GH.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Within the analysis area, vegetation treatments would continue to be used to achieve resource management objectives and would be considered to protect sagebrush ecosystems. Restoration would be prioritized based on the proposed benefit to GRSG. In general, vegetation treatments and sagebrush ecosystem restoration would increase habitat for sagebrush obligates but would reduce grassland habitat, understory habitat, and habitat for species associated with adjacent encroaching conifers.

#### ***Impacts from ACECs***

Impacts would be the same as under Alternative A.

### **4.19.6 Alternative C**

#### ***Impacts from Travel and Transportation Management***

New road construction would be prohibited within four miles of active leks and avoided in PH and GH. Road construction would be limited to realignments of existing routes in PH, if the realignment has minimal impact on GRSG habitat. Prohibiting or limiting new road construction in the decision area would minimize impacts on wildlife species in these areas, as described in **Section 4.18.2**.

#### ***Impacts from Recreation***

As under Alternative A, the BLM would continue to manage the area for dispersed recreation, such as hunting, camping, biking, and hiking; therefore, no protection would be provided to wildlife species' habitats. Impacts would be similar to Alternative A.

#### ***Impacts from Lands and Realty***

PH would be managed as ROW exclusion areas (345,560 acres) and no ROW avoidance areas would be established. ROW exclusion areas would improve protection of wildlife species as described in **Section 4.18.2**. Private lands, when offered, may be acquired in ACECs to enhance GRSG conservation value of existing lands. Adding lands to ACECs would enhance protection of wildlife species in these areas.

#### ***Impacts from Range Management***

Grazing would be removed on allotments within PH and GH (337,165 acres, comprising 69,408 AUMs) under Alternative C. Impacts from grazing on wildlife species, as described in **Section 4.18.2**, would be reduced. However, the potential for more fine fuels to accumulate as a result of decreased grazing could increase wildland fires. In the long term, sagebrush habitat availability could be reduced, but grasses and habitat for grassland species could increase.

The total exclusion of grazing in PH and GH would also eliminate the need for maintaining nearly 90 percent of stock water in the long term.

A minimum amount of stock water ponds would be maintained for other wildlife management on BLM-administered lands in the planning area. Amphibians, shorebirds and waterfowl, and aquatic invertebrates that depend on stock water would decrease. However, the substantial reduction in stock water in GRSG habitat on BLM-administered lands under Alternative C would likely decrease the risk of mosquito-borne diseases. Stock water on land not administered by the BLM would still be maintained. Additional impacts wildlife species from changes in range management under Alternative C are similar to those described in **Section 4.18.6**, Alternative C.

***Impacts from Fluid Minerals***

Fluid minerals management would apply RDFs and conservation measures as COAs to existing leases. This would limit surface occupancy within PH and GH, would impose seasonal restrictions on exploratory drilling, including vehicle traffic and other human activity, and would restrict surface disturbance to three percent of the area. Seasonal surface limitations would decrease impacts on wildlife species that inhabit PH and GH, as described in **Section 4.18.2**.

***Impacts from Solid Minerals***

Impacts from all actions on wildlife species would be the same as described under Alternative B.

***Impacts from Fire and Fuels Management***

Fuels treatments would not be allowed in winter range unless the treatment is designed to reduce wildfire risk and maintain habitat quality in the winter range. Proper fire control and adequate preparation work would be used in any fuel reduction project. Vegetation treatment plans would include pretreatment data, nongrazing exclosures, and long-term monitoring.

Fire suppression and emergency stabilization projects would be as described under Alternative B and would result in similar effects on wildlife species.

***Impacts from Habitat Restoration and Vegetation Management***

Actions would be the same as under Alternative B. There would be additional measures to prioritize restoration in seasonal habitats thought to be limiting GRSG and where factors causing degradation have already been addressed. Vegetation treatments and sagebrush ecosystem restoration would increase available habitat for sagebrush obligates; however, grassland species habitat or species that inhabit encroaching conifers would likely decline.

***Impacts from ACECs***

ACECs to protect GRSG would be designated as sagebrush reserves in PH, consisting of 4,000-acre blocks of BLM-administered land, covering 96,246 acres. However, no additional protections would occur for GRSG or habitat that

could reduce impacts on wildlife habitat with an ACEC designation since all conservation measures would be applied to both PH and GH under Alternative C.

#### **4.19.7 Alternative D**

##### ***Impacts from Travel and Transportation Management***

Prohibiting or limiting road construction in the decision area would minimize direct and indirect impacts on wildlife, as described in **Section 4.18.2**. Impacts on wildlife habitat from this proposed action are similar to those described for other special status species under **Section 4.18.7**, Alternative D.

##### ***Impacts from Recreation***

The actions proposed under this alternative are similar to Alternative B. SRPs would be issued only in habitat areas where the effects of recreation were neutral or beneficial to GRSG habitat. This action would reduce impacts from recreation described in **Section 4.18.2** for wildlife species that occupy PH.

##### ***Impacts from Lands and Realty***

Management actions proposed under this alternative could increase the protection of wildlife, compared to those provided under Alternatives B and C, by minimizing disturbance on the landscape (taking ownership patterns and private lands into account). Public ownership would be maintained in PH, except where land exchanges would provide a greater benefit to GRSG. Ownership changes would reduce impacts described in **Section 4.18.2** for wildlife species that inhabit PH.

##### ***Impacts from Range Management***

Under Alternative D, there would be no change to the acreage open for grazing or available AUMs. Currently, 337,165 acres in the decision area are open for livestock grazing, with 69,408 available AUMs. Within PH, the BLM would conduct land health evaluations and determinations that include (at a minimum) indicators and/or measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. Management actions would be developed if land health determinations indicate that an allotment is not meeting standards due to current livestock grazing. State objectives would be used for fine-scale analysis unless local objectives are developed at the field office level, in partnership with MFWP and USFWS.

Wet meadows and riparian areas in PH would be managed by the LFO to maintain forbs, edge cover, and species richness to facilitate GRSG brood rearing. Seasonal restrictions on livestock grazing would reduce pressure on riparian vegetation used by GRSG in summer. New water diversions from seeps or springs would be authorized only when PH would benefit from the development. Modifications to water developments would be considered to maintain continuity of riparian areas within PH. Reservoirs and stock ponds with riparian/wetland characteristics would be managed to support wildlife to the

extent possible, with consideration given to the original purpose of the development.

Vegetation treatments to increase forage for livestock would only be allowed in PH if they conserve or enhance GRSG habitat. Allowances would be made for treatments with negative short-term effects but overall long-term positive impacts. Structural range improvements would be designed to improve GRSG habitat, as described under Alternative B. The proposed actions described under Alternative D would restrict grazing in PH and would provide range enhancements to benefit GRSG. Sagebrush obligate species within PH would increase habitat quantity and quality under Alternative D.

#### ***Impacts from Fluid Minerals***

During implementation review, conservation measures would be applied in conformance with the approved RMP and a list of constraints and BMPs applied as COA to leases. The conditions are designed to minimize noise, traffic, and other disturbance associated with mineral extraction. These limited measures to reduce disturbance would likely have minimal impact on wildlife species compared to current practices.

#### ***Impacts from Solid Minerals***

As there is no coal potential in the planning area, there would be no impacts from coal development. Locatable minerals development would be managed as described under Alternative A. Mineral pits would be restored as described under Alternative B. These actions would have minimal impacts on wildlife species.

#### ***Impacts from Fire and Fuels Management***

Fuels management would be designed and implemented as described in Alternative C. Fire suppression would be prioritized, BMPs would be applied, and ES&R procedures would be as described under Alternative B. Additional provisions would be implemented to protect vegetation to benefit GRSG in areas susceptible to fire. Livestock grazing would be considered for fuel reduction, as described under Alternative B. These actions would minimize impacts on sagebrush obligate species.

#### ***Impacts from Habitat Restoration and Vegetation Management***

Under Alternative D, habitat restoration would give special emphasis to protecting sagebrush ecosystems in designing vegetation treatments, similar to the actions proposed under Alternative B. Prioritization would occur as described under Alternative B, with emphasis given to other sensitive and listed species, in addition to GRSG. Restoration projects would strive to meet GRSG habitat objectives for projects in PH, but those objectives would not be the highest priority, as under Alternatives B and C.

This alternative includes the caveat that other restoration projects may take precedence over sagebrush projects, based on such factors as funding

requirements, landowner cooperation, and future ESA listings. Compared to Alternatives B and C, the actions proposed under Alternative D would provide more protection for wildlife habitat that overlap with other special status species' and GRSG habitat.

#### **Impacts from ACECs**

Impacts would be the same as under Alternative A.

## **4.20 RENEWABLE ENERGY**

### **4.20.1 Methods and Assumptions**

#### **Indicators**

**Table 4-31**, Comparison of Renewable Energy Resource Indicators by Alternative, provides a summary of the indicators that were used to analyze the effects on renewable energy under each alternative.

**Table 4-31**  
**Comparison of Renewable Energy Resource Indicators by Alternative**

Indicator	Alternative			
	A	B	C	D
Acres with "Good" or better wind potential within ROW exclusion areas	0	43,728	49,322	0
Acres with "Good" or better wind potential within ROW avoidance areas	0	5,595	0	49,322
Acres with "Good" or better solar potential within ROW exclusion areas	0	0	0	0
Acres with "Good" or better solar potential within ROW avoidance areas	0	0	0	0

#### **Assumptions**

The analysis includes the following assumptions:

- "Good" or better wind potential is classified as wind speeds of 7.0 meters/second at 50 meters height or at wind power density of above 400 watts/meter (NREL 2012a).
- "Good" or better solar potential is classified as having average annual solar energy above 6.0 kilowatt-hours/square meter/day or a solar power density above 400 watts/square meter (NREL 2012b).
- Existing ROWs may be modified on their renewal, assignment, or amendment if the requested actions meet the objectives of the amended RMP.
- ROW holders may continue their authorized use as long as they are in compliance with the terms and conditions of their grant.

- The demand for ROWs would increase over the life of the amended RMP.
- Renewable energy resources include solar, wind, and biomass facilities. Biomass projects are generally authorized under the forestry regulations, unless a new facility is being authorized for biomass generation, which would likely be authorized under lands and realty regulations. Based on recent trends (see **Chapter 3**), the development of biomass facilities within the planning area is unlikely; therefore, impacts from biomass production facilities are not analyzed.

Alternatives were evaluated for acres of ROW avoidance, acres of ROW exclusion, and areas where new road construction is prohibited or to be avoided. All of these factors are considered to be impediments to solar and wind development. Alternatives with greater acreages of such restrictions are considered to have a greater impact on solar and wind development potential than alternatives with fewer acres of such restrictions.

#### **4.20.2 Nature and Type of Effects**

Impacts on solar and wind projects are generally related to where ROW authorizations are allowed to occur, the mitigation measures required for specific project siting, and special stipulations required for resource protection.

ROWs can only occur on lands that are not ROW exclusion areas. Alternatives with greater ROW exclusion acreages would have long-term direct impacts on the ability for solar and wind projects to be developed.

As discussed in **Section 4.3**, ROW applications may be filed within ROW avoidance areas; however, projects proposed in such areas may be subject to restrictions that would add application processing time and increased project costs. Alternatives with greater ROW avoidance areas are considered to have short-term direct impacts (e.g., special surveys, reports, and construction and reclamation BMPs) and long-term direct impacts (e.g., potential operation and maintenance requirements) on the development of renewable energy resources.

Implementing management for the following resources would have negligible or no impact on renewable energy and are therefore not discussed in detail: travel and transportation management, recreation, range management, fluid minerals, solid minerals, mineral split estate, fire and fuels management, habitat restoration and vegetation management, and ACECs.

#### **4.20.3 Impacts Common to All Alternatives**

The acreages of ROW exclusions and avoidances vary across alternatives and are provided in **Table 4-32**, BLM-Administered Lands Managed as ROW Exclusion and Avoidance Areas.

**Table 4-32**  
**BLM-Administered Lands Managed as ROW Exclusion and Avoidance Areas**

	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW exclusion area (acres)	0	233,219	345,560	0
ROW avoidance area (acres)	9,708	112,341	0	233,219

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

**Table 4-33**, “Good” or Better Wind Potential That Would Be Managed as ROW Exclusion and Avoidance Areas, provides an overview of impacts across alternatives on wind development potential through showing the number of acres of “Good” or better (Class 4 or higher) wind potential within ROW exclusion and avoidance areas.

**Table 4-33**  
**“Good” or Better Wind Potential That Would Be Managed as ROW Exclusion and Avoidance Areas**

	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
ROW exclusion area (acres)	0	43,728	49,322	0
ROW avoidance area (acres)	0	5,595	0	49,322

Collocating utilities would reduce land use conflicts by grouping similar facilities and activities in specific areas and away from conflicting developments and activities. It would also clarify the preferred locations for utilities on BLM-administered lands, would make construction and maintenance of the facilities easier, and would simplify the application process for new facilities.

#### **4.20.4 Alternative A**

##### ***Impacts from Lands and Realty***

Under Alternative A, zero acres of lands with “Good” or better wind potential would be affected by ROW exclusion or avoidance areas. All lands with such potential would continue to be open for ROW applications on a case-by-case basis.

#### 4.20.5 Alternative B

##### *Impacts from Lands and Realty*

Under Alternative B, 233,219 acres would be managed as ROW exclusion areas and would not be open for ROW applications. Within this exclusion area, there are 43,728 acres considered to have “Good” or better wind potential. This represents 70 percent of lands with “good” or better wind potential that exist within the decision area. Management under Alternative B would result in 43,728 fewer acres open to wind energy development than under Alternative A. Therefore, 70 percent of lands with “Good” or better wind potential that are open for ROW applications within the decision area under Alternative A would become ROW exclusion areas under Alternative B and would not be available for wind development.

Under Alternative B, an additional 102,633 acres would be managed as ROW avoidance areas. Within this ROW avoidance area there are 5,595 acres considered to have “Good” or better wind potential. This represents nine percent of lands with “good” or better wind potential that exist within the decision area. Management under Alternative B would result in 5,595 fewer acres available for wind development without substantial restrictions. Therefore, under Alternative B, nine percent of lands with “Good” or better wind potential available for ROW applications within the decision area would be subject to substantial restrictions when compared with Alternative A.

**Table 4-34**, Wind Potential Affected by Alternative B, provides a detailed overview of how these ROW restrictions relate to individual wind classes.

**Table 4-34**  
**Wind Potential Affected by Alternative B**

Wind Potential (square meters at 50 meters)	Total Acres on BLM-Administered Land	ROW Exclusion (percent of total)	ROW Avoidance (percent of total)
Class 4 “Good” 7.0-7.5	55,951	41,601.4 (74%)	5,247.1 (9.4%)
Class 5 “Very Good” 7.5-8.0	5,700.3	2,120.6 (37%)	301.2 (5.3%)
Class 6 “Excellent” 8.0-8.8	965.7	5.7 (0.6%)	45.2 (4.7%)
Class 7 “Best” 8.8 & above	318.5	0 (0%)	1.2 (0.4%)
<b>Total Classes 4-7</b>	<b>62,935.5</b>	<b>43,727.7 (70%)</b>	<b>5,594.7 (8.8%)</b>

Source: NREL 2012a; BLM 2012a

#### 4.20.6 Alternative C

##### *Impacts from Lands and Realty*

Under Alternative C, 345,560 acres would be managed as ROW exclusion areas and would not be open for ROW authorizations. Within this exclusion area there are 49,322 acres considered to have “Good” or better wind potential.

This represents 79 percent of lands with “good” or better wind potential that exist within the decision area. Alternative C would result in 49,322 acres open to wind energy development than under Alternative A. Therefore, 79 percent of lands with “Good” or better wind potential that are open for ROW applications in the decision area under Alternative A would become ROW exclusion areas under Alternative C and would not be available for wind development.

**Table 4-35**, Wind Potential Affected by Alternative C, provides a detailed overview of how these ROW restrictions relate to individual wind classes.

**Table 4-35**  
**Wind Potential Affected by Alternative C**

<b>Wind Potential (square meters at 50 meters)</b>	<b>Total Acres on BLM- Administered Land</b>	<b>ROW Exclusion (percent of total)</b>	<b>ROW Avoidance (percent of total)</b>
Class 4 “Good” 7.0-7.5	55,951	46,848.4 (84%)	0
Class 5 “Very Good” 7.5-8.0	5,700.3	2,421.8 (42%)	0
Class 6 “Excellent” 8.0-8.8	965.7	50.9 (5.3%)	0
Class 7 “Best” 8.8 & above	318.5	1.2 (0.4%)	0
Total Classes 4-7	62,935.5	49,322.3 (79%)	0

Source: NREL 2012a; BLM 2012a

#### 4.20.7 Alternative D

##### *Impacts from Lands and Realty*

Under Alternative D, no acres would be managed as ROW exclusion areas and would not be open for ROW applications. Therefore, the same acreage would be open to wind energy development as under Alternative A.

Under Alternative D, an additional 233,219 acres would be managed as ROW avoidance areas. Within this ROW avoidance area there are 49,322 acres considered to have “Good” or better wind potential. This represents 79 percent of lands with “Good” or better wind potential that exist within the decision area. Management under Alternative D would result in 49,322 fewer acres available for wind development without substantial restrictions. Therefore, under Alternative D 79 percent of lands with “Good” or better wind potential available for ROW applications would be subject to substantial restrictions when compared with Alternative A.

**Table 4-36**, Wind Potential Affected by Alternative D, provides a detailed overview of how these ROW restrictions relate to individual wind classes.

**Table 4-36**  
**Wind Potential Affected by Alternative D**

<b>Wind Potential (square meters at 50 meters)</b>	<b>Total Acres on BLM- Administered Land</b>	<b>ROW Exclusion (percent of total)</b>	<b>ROW Avoidance (percent of total)</b>
Class 4 "Good" 7.0-7.5	55,951	0	46,848.4 (84%)
Class 5 "Very Good" 7.5-8.0	5,700.3	0	2,421.8 (42%)
Class 6 "Excellent" 8.0-8.8	965.7	0	50.9 (5.3%)
Class 7 "Best" 8.8 & above	318.5	0	1.2 (0.4%)
<b>Total Classes 4-7</b>	<b>62,935.5</b>	<b>0</b>	<b>49,322.3 (79%)</b>

Source: NREL 2012a; BLM 2012a

## 4.21 SOCIAL AND ECONOMIC CONDITIONS

### 4.21.1 Methods and Assumptions

The analysis of economic effects considers job and labor income in an economic impact analysis. Economic impact analysis is used to evaluate potential direct, indirect, and induced effects on the economy. The analytical technique used by the BLM to estimate employment and income impacts is "input-output" analysis using the IMPLAN Pro software system. Input-output analysis is a means of examining relationships within an economy both between businesses and between businesses and final consumers. It captures all monetary market transactions for consumption in a given time period. The resulting mathematical representation allows one to examine the effect of a change in one or several economic activities on an entire economy, all else constant. This examination is called economic impact analysis. IMPLAN translates changes in final demand for goods and services into economic effects, such as labor income and employment of the affected area's economy. The IMPLAN modeling system requires one to build regional economic models of one or more counties for a particular year. The model for this analysis uses 2010 IMPLAN data and the impact area for this analysis includes Chouteau, Fergus, Judith Basin, Meagher, and Petroleum counties.

The impacts on the local economy from the RMPA are measured by estimating the employment (full- and part-time jobs) and labor income generated by grazing on allotments potentially affected and recreation under the alternatives. The direct employment and labor income benefit employees and their families and therefore directly affect the local economy. Additional indirect and induced multiplier effects (ripple effects) are generated by the direct activities. Together the direct and multiplier effects comprise the total impacts on the local economy (**Table 4-37**, Employment and Labor Income Generated from Recreation and Grazing under the RMPA). The multiplier effects tied to grazing and recreation were estimated using IMPLAN. Potential limitations of these estimates are the time lag in IMPLAN data and the data intensive nature of the input-output model.

**Table 4-37**  
**Employment and Labor Income Generated from Recreation and Grazing under the RMPA**

	Employment (full and part time jobs)				Labor Income (thousands of 2013 dollars)			
	Alt A	Alt B	Alt C	Alt D	Alt A	Alt B	Alt C	Alt D
Wildlife related recreation	8	less than Alt A	less than other Alts	less than Alt A	\$192	less than Alt A	less than other Alts	less than Alt A
Non-Wildlife related recreation	12	less than Alt A	less than other Alts	less than Alt A	\$289	less than Alt A	less than other Alts	less than Alt A
Grazing	201	201	66	201	\$2,810	\$2,810	\$931	\$2,810

Source: IMPLAN 2010

#### 4.21.2 Alternative A

A summary of impacts on employment and labor income across alternatives is provided in **Table 4-37**. Details of analysis are provided below by resource and resource use.

##### ***Impacts from Range Management***

Livestock grazing would continue to be managed under the existing RMPs and Standards for Rangeland Health. Consequently, current economic contributions from allocated grazing on allotments covered under this RMPA would continue. Use of allocated forage on these allotments would generate 201 total jobs (direct, indirect, and induced) and \$2.8 million in labor income (direct, indirect and induced) on an average annual basis within the impact area economy (refer to **Table 4-37**). On an annual basis use of the allocated forage and associated employment and income can be less based on market conditions, drought or range practices to protect other resources. As noted in the discussion of employment specialization above, the five-county impact area can be considered specialized with respect to the grazing sector. Direct employment generated as a result of grazing under this alternative would provide 128 jobs which would comprise about 29 percent of employment in this sector.

##### ***Impacts from Lands and Realty***

Currently, there are no ROW exclusion areas within the decision area. As a result, land use authorizations would continue to be analyzed and if approved could continue to support area communities and economies under this alternative. There are two ROW avoidance areas within the decision area. One is within PH and one in GH. Under this alternative, land use authorizations could continue within avoidance areas with implementation of proper mitigation measures.

***Impacts from Recreation***

Under Alternative A, BLM management would result in no additional measures to protect GRSG habitat. As a result, no impacts on recreation on BLM-administered lands would occur and associated economic contributions to the five-county impact would continue. Approximately eight jobs (direct, indirect, and induced) are associated with wildlife related recreation and 12 jobs (direct, indirect and induced) are associated with recreation not related to wildlife in the five-county impact area (refer to **Table 4-37**). Direct employment generated as a result of wildlife and recreation not related to wildlife under this alternative would comprise about one percent of employment in sectors specifically attributable to tourism and recreation.

***Impacts from Habitat Restoration and Vegetation Management and ACECs***

Management under this alternative would not specifically protect GRSG habitat. Grazing methods, land treatments and other improvements would continue to be designed to accomplish habitat restoration objectives. Continuation of these policies would promote sagebrush habitat, but less than under Alternatives B or C. No ACECs to protect GRSG habitat would be included in this alternative. As a result, well-being and non-market values associated with GRSG habitat would be less than Alternatives B and C.

**4.21.3 Alternative B**

***Impacts from Range Management***

Under Alternative B, there would be no change to the acreage open for grazing or available AUMs. AMPs and permit renewals would be used to incorporate GRSG management objectives into grazing allotments. Consequently, it is anticipated that current economic contributions from allocated grazing on allotments covered under this RMPA would continue. Use of allocated forage on these allotments generates 201 total jobs (direct, indirect and induced) and \$2.8 million in labor income (direct, indirect and induced) on an average annual basis within the impact area economy (refer to **Table 4-37**). On an annual basis use of the allocated forage and associated employment and income can be less based on market conditions, drought or range practices to protect other resources. In addition, further reductions could occur with voluntary retirement of allotments under Alternative B, which would further reduce economic contributions. As noted in the discussion of employment specialization, the five-county impact area can be considered specialized with respect to the grazing sector. Direct employment generated as a result of grazing under this alternative would provide 128 jobs which would comprise about 29 percent of employment in this sector.

***Impacts from Lands and Realty and Energy Development***

Under Alternative B, 233,219 acres (67 percent) of the decision area associated with PH would be managed as ROW exclusion areas for new ROW

authorizations. Further, GH would be identified as ROW avoidance areas. ROW development and land use authorizations within ROW avoidance areas would generally avoid habitat areas, but authorizations are possible if proper mitigation measures are implemented as part of the development and authorization to offset any loss of general GRSG habitat if impacted. In addition, new ROWs in PH may only be authorized if they are collocated completely within the footprint of an existing authorized ROW. Further, under this alternative, development associated with valid existing rights (an authorized ROW which needs improvement) would only be allowed to the absolute minimum standards. All new disturbances would be limited so not to exceed a disturbance of three percent for that area. Therefore, this alternative may limit new ROWs or energy development within the planning area and would consequently support communities and economies less than under Alternative A.

#### ***Impacts from Recreation***

Under Alternative B, BLM would consider the effects of SRPs on PH. If future SRP applications were denied (if not found to be neutral or beneficial to GRSG) under this alternative, there would be a less organized hunting opportunities on BLM-administered land in the decision area as compared with Alternative A. As a result, economic contributions could be less than current contributions depicted under Alternative A.

#### ***Impacts from Habitat Restoration and Vegetation Management and ACECs***

Under this alternative, restoration projects would be prioritized based on benefit to GRSG habitat. Vegetation treatments would continue to be used for resource management objectives such as protection of sagebrush ecosystems. These actions would enhance GRSG habitat. No ACECs to protect GRSG habitat would be included in this alternative.

### **4.21.4 Alternative C**

#### ***Impacts from Range Management***

Under Alternative C, livestock grazing would be removed from all allotments in PH and GH resulting in a 66 percent reduction in AUMs relative to Alternative A. Consequently, it is anticipated that economic contributions from allocated grazing on allotments covered under this RMPA would be less than currently contributed. As a result of the reductions employment would decrease from 201 to 66 total jobs (direct, indirect and induced) and labor income would decrease from \$2.8 million to \$931,000 (direct, indirect and induced) on an average annual basis within the impact area economy (refer to **Table 4-37**). Decreases may not be as large since actual use of BLM is not equal to allocated use levels analyzed here. For example on any given year actual employment associated with billed use could be less than 201 jobs if actual use of BLM forage is less than allocated (possible due to increases in prices of factors of

production, drought, market conditions, etc.). In addition, the decrease portrayed here could be less if alternative sources of forage is found for willing permittees. As noted in the discussion of employment specialization above, the five-county impact area can be considered specialized with respect to the grazing sector. Direct employment generated as a result of grazing under this alternative would decrease from 128 jobs to 42 jobs which would correspond to a decrease from 29 percent to 10 percent of employment in this sector.

***Impacts from Lands and Realty and Energy Development***

Under Alternative C, 345,560 acres of the decision area associated with PH and GH would be managed as ROW exclusion area for new ROW grants. As a result, current land use authorizations would be relocated which could decrease the degree to which area communities and economies depend on current authorizations under this alternative. In addition, new applications in PH may only be authorized if they are collocated completely within the footprint of an existing authorization. Further, under this alternative, development associated with valid existing rights (an authorization which needs improvement) would only be allowed to the absolute minimum standards. All new disturbances would be limited so not to exceed a disturbance of three percent for that area. Therefore, this alternative may limit new authorizations or energy development within the planning area and would consequently support communities and economies less than under Alternative A.

***Impacts from Recreation***

Under Alternative C, implementation of a travel plan could change access important for current recreation activities in the decision area. If changes to recreation access occurred there would be a reduction in recreation visitation on BLM-administered lands in the decision area. As a result, economic contributions could be less than current contributions (depicted under Alternative A) and the other alternatives.

***Impacts from Habitat Restoration and Vegetation Management and ACEC***

Under this alternative, additional actions would promote expansion of GRSG habitat at levels greater than the other alternatives. In addition, ACECs to protect GRSG habitat would be designated under in this alternative. These policies would promote expansion of GRSG habitat. As a result, well-being and non-market values associated with GRSG habitat would be protected to a greater degree than the other alternatives.

**4.21.5 Alternative D**

***Impacts from Range Management***

Under Alternative D, there would be no change to the acreage open for grazing or available AUMs. GRSG habitat objectives would be considered when evaluating land health standards. Consequently, it is anticipated that current

economic contributions from allocated grazing on allotments covered under this RMPA would continue. Use of allocated forage on these allotments generates 201 total jobs (direct, indirect and induced) and \$2.8 million in labor income (direct, indirect and induced) on an average annual basis within the impact area economy (refer to **Table 4-37**). On an annual basis use of the allocated forage and associated employment and income can be less based on market conditions, drought or range practices to protect other resources. Unlike Alternative B, further reductions from voluntary retirement of allotments would not occur consequently this alternative is likely to sustain current contributions to a greater degree than Alternative B. As noted in the discussion of employment specialization above, the five-county impact area can be considered specialized with respect to the grazing sector. Direct employment generated as a result of grazing under this alternative would provide 128 jobs which would comprise about 29 percent of employment in this sector.

***Impacts from Lands and Realty and Energy Development***

Under Alternative D, PH (233,219 acres within the decision area) would be managed as an avoidance area for new applications for ROWs, leases, or permits. In GH (112,341 acres), Alternative D would allow for the issuance of ROWs, leases, and permits with appropriate conservation and mitigation measures on a case-by-case basis. As a result, local communities and economies (as well as individuals who may live in remote locations) may be impacted, depending on the degree to which they rely on local electricity or utility services.

Further, under this alternative, development associated with valid existing rights (an authorization that needs improvement) would be allowed only to minimum standards. Therefore, this alternative would provide less support to the communities than Alternative A but more than Alternatives B or C.

***Impacts from Recreation***

Under Alternative D, impacts on recreation would be the same as discussed under Alternative B. As a result, economic contributions would be the same as Alternative B.

***Impacts from Habitat Restoration and Vegetation Management and ACECs***

Under this alternative, other restoration projects associated with threatened, endangered, or sensitive species would be considered when prioritizing projects, which could reduce the potential to improve GRSG habitat. In addition, no ACECs to protect GRSG habitat would be included in this alternative. As a result, well-being and non-market values associated with other threatened and endangered species habitat would be more than Alternatives B and C. Due to uncertainty in how restoration projects are prioritized, a relative comparison to Alternative A cannot be made.

#### **4.22 ENVIRONMENTAL JUSTICE**

While minority and low-income populations may exist in the area, the alternatives are not expected to have a disproportionately high and adverse human health or environmental effects on these communities. Impacts on local communities are expected to be negligible, and there is no reason to suspect that any impacts would disproportionately affect minority and low income populations. For example, decreases in employment and income anticipated under Alternative C would be distributed amongst all segments of the population regardless of minority or poverty status.

#### **4.23 UNAVOIDABLE ADVERSE IMPACTS**

Section 102(C) of NEPA requires disclosure of any adverse environmental effects that cannot be avoided should the proposal be implemented. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which there are no mitigation measures. Some unavoidable adverse impacts occur as a result of implementing the Lewistown Field Office Greater-Sage-Grouse RMPA. Others are a result of public use of the decision area lands. This section summarizes major unavoidable impacts; discussions of the impacts of each management action (in the discussion of impacts by alternatives for each resource topic) provide greater information on specific unavoidable impacts.

Surface-disturbing activities would result in unavoidable adverse impacts under current BLM policy to foster multiple uses. Although these impacts would be mitigated to the extent possible, unavoidable damage would be inevitable. Long-term conversion of areas to other uses such as mineral and energy development would increase erosion and change the relative abundance of species within plant communities, the relative distribution of plant communities, and the relative occurrence of seral stages of those communities. Where habitat areas are not protected by stipulations, oil and gas development would result in unavoidable long-term wildlife habitat loss where developed.

Wildlife and livestock would contribute to soil erosion, compaction, and vegetation loss, which could be extensive during drought cycles and dormancy periods. Conversely, unavoidable losses or damage to forage from resource development in the planning area would affect livestock and wildlife. Some level of competition for forage between these species, although mitigated to the extent possible, would be unavoidable. Instances of displacement, harassment, and injury could also occur.

Recreational activities, mineral resource development, and general use of the planning area would introduce additional ignition sources into the planning area, which would increase the probability of wildland fire occurrence and the need for suppression activities. These activities, combined with continued fire suppression, would also affect the overall composition and structure of

vegetation communities, which could increase the potential for high-intensity wildland fires.

As recreation demand increases, recreation use would disperse, creating unavoidable conflicts as more users compete for a limited amount of space. In areas where development activities would be greater, the potential for displaced users would increase.

Numerous land use restrictions imposed throughout the planning area to protect sensitive resources and other important values, by their nature, affect the ability of operators, individuals, and groups who use BLM-administered lands to do so freely without limitations. These restrictions could also require closing roads or trails or limiting certain modes or seasons of travel. Although attempts would be made to minimize these impacts by limiting them to the level of protection necessary to accomplish management objectives, and providing alternative use areas for affected activities, unavoidable adverse impacts would occur under all alternatives.

#### **4.24 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Section 102(C) of NEPA requires a discussion of any irreversible or irretrievable commitments of resources that are involved in the proposal should it be implemented. An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time (e.g., extraction of any solid mineral ore or oil and gas). An irreversible commitment of a resource is one that cannot be reversed (e.g., the extinction of a species).

Implementing the Lewistown Field Office Greater Sage-Grouse RMPA management actions would result in surface-disturbing activities, including permitted recreation activities, mineral and energy development, and development in ROWs, which result in a commitment to the loss of irreversible or irretrievable resources. Mineral extraction or sale eliminates a nonrenewable resource, thereby resulting in irreversible and irretrievable commitment of the resource. Surface disturbance associated with energy development is reclaimed after the resource is removed. However, surface disturbances from gas storage, and road ROWs, and wind development are a long term encumbrance of the land. Soil erosion or the loss of productivity and soil structure may be considered irreversible commitments to resources. Surface-disturbing activities, therefore, would remove vegetation and accelerate erosion that would contribute to irreversible soil loss; however, management actions, RDFs, and BMPs are intended to reduce the magnitude of these impacts and restore some of the soil and vegetation lost. Primarily because of the number of acres available for energy and mineral development, and development in ROWs, such disturbances would occur to the greatest degree under Alternative A; management under Alternative D would be similar but with more stipulations for surface-disturbing activities. Alternative B, and to a greater extent

Alternative C, contains additional conservation measures, mitigation measures, and stipulations to protect planning area resources.

Across all alternatives, an irreversible commitment of nonrenewable fossil fuels (e.g., oil, gas), solid minerals, and salable materials would occur from development over the life of the Headwaters Resource Management Plan and Judith Resource Area Resource Management Plan.

#### **4.25 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

Section 102(C) of NEPA requires discussion of the relationship between local, short-term uses of the human environment, and the maintenance and enhancement of long-term productivity of resources. As described in the introduction to this chapter, “short term” is defined as anticipated to occur within one to five years of the activity’s implementation. “Long term” is defined as following the first five years of implementation, but within the life of the Headwaters Resource Management Plan and Judith Resource Area Resource Management Plan.

Across all alternatives, management actions would result in various short-term effects, such as increased localized soil erosion, fugitive dust emission, vegetation loss or damage, and wildlife disturbance. Surface-disturbing activities, including utility construction and mineral resource development would result in the greatest potential for impacts on long-term productivity. Management prescriptions, RDFs, and BMPs are intended to minimize the effect of short-term commitments and reverse change over the long term. These prescriptions and the associated reduction of impacts would be greatest under Alternative C and are present to a lesser extent under Alternative B for resources such as vegetation and wildlife habitat. However, BLM-administered lands are managed to foster multiple uses, and some impacts on long-term productivity could occur.

The short-term use of potential habitat for energy and minerals, and development in ROWs could also affect the long-term sustainability of some special status species. Special status species could be affected by habitat fragmentation associated with short-term resource uses and road construction and use.

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**CHAPTER 5**  
**CUMULATIVE IMPACTS**



# CHAPTER 5

## CUMULATIVE IMPACTS

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### 5.1 INTRODUCTION

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

Cumulative impacts are effects on the environment that result from the impact of implementing any one of the Lewistown Field Office Greater Sage-Grouse RMPA/EIS alternatives in combination with other actions outside the scope of this plan, either within the planning area or adjacent to it. Cumulative impact analysis is required by CEQ regulations because environmental conditions result from many different factors that act together. The total effect of any single action cannot be determined by considering it in isolation, but must be determined by considering the likely result of that action in conjunction with many others. Evaluation of potential impacts considers incremental impacts that could occur from the proposed project, as well as impacts from past, present, and reasonably foreseeable future actions. Management actions could be influenced by activities and conditions on adjacent public and non-public lands beyond the planning area boundary; therefore, assessment data and information could span multiple scales, land ownerships, and jurisdictions. These assessments involve determinations that often are complex and, to some degree, subjective.

#### 5.1.1 Cumulative Analysis Methodology

The cumulative impacts discussion that follows considers the alternatives in the context of the broader human environment – specifically, actions that occur outside the scope and geographic area covered by the planning area. Cumulative impact analysis is limited to important issues of national, regional, or local significance.

Because of the programmatic nature of the RMPA and cumulative assessment, the analysis tends to be broad and generalized to address potential impacts that could occur from a reasonably foreseeable management scenario combined with other reasonably foreseeable activities or projects. Consequently, this assessment is primarily qualitative for most resources because of a lack of detailed information that would result from project-level decisions and other activities or projects. Quantitative information is used whenever available and as appropriate to portray the magnitude of an impact. The analysis assesses the magnitude of cumulative impacts by comparing the environment in its baseline condition with the expected impacts of the alternatives and other actions in the same geographic area. The magnitude of an impact is determined through a comparison of anticipated conditions against the naturally occurring baseline as depicted in the affected environment (see **Chapter 3**) or the long-term sustainability of a resource or social system.

The following factors were considered in this cumulative impact assessment:

- Federal, nonfederal, and private actions.
- Potential for synergistic impacts or synergistic interaction among or between impacts.
- Potential for impacts across political and administrative boundaries.
- Other spatial and temporal characteristics of each affected resource.
- Comparative scale of cumulative impacts across alternatives.

The geographic scope for the cumulative impact analysis extends to the planning area boundary. For **Section 5.1.3**, Greater Sage-Grouse, the cumulative impact analysis includes an analysis at the WAFWA MZ I (Great Plains) and MZ IV (Snake River Plains) levels, in addition to the planning area analysis. WAFWA management zones are biologically based delineations that were determined by GRSG populations and sub-populations identified within seven floristic provinces. Analysis at this level enables the decision maker to understand the impacts on GRSG at a biologically meaningful scale.

#### **5.1.2 Past, Present, and Reasonably Foreseeable Future Actions**

Past, present, and reasonably foreseeable future actions are considered in the analysis to identify whether and to what extent the environment has been degraded or enhanced, whether ongoing activities are causing impacts, and trends for activities in and impacts on the area. Projects and activities are evaluated on the basis of proximity, connection to the same environmental systems, potential for subsequent impacts or activity, similar impacts, the likelihood a project will occur, and whether the project is reasonably foreseeable.

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

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

Reasonably foreseeable future action scenarios are projections made to predict future impacts – they are not actual planning decisions or resource commitments. Projections, which have been developed for analytical purposes only, are based on current conditions and trends and represent a best professional estimate. Unforeseen changes in factors such as economics, demand, and federal, state, and local laws and policies could result in different outcomes than those projected in this analysis.

Other potential future actions have been considered and eliminated from further analysis because there is a small likelihood these actions would be pursued and implemented within the life of the plan or because so little is known about the potential action that formulating an analysis of impacts is premature and/or speculative. In addition, potential future actions protective of the environment (such as new regulations related to fugitive dust emissions) have less likelihood of creating major environmental consequences alone, or in combination with this planning effort. Federal actions such as species listing would require BLM to reconsider decisions created from this action because the consultations and relative impacts might no longer be appropriate. These potential future actions may have greater capacity to affect resource uses within the planning area; however, until more information is developed, no reasonable estimation of impacts could be developed.

Data on the precise locations and overall extent of resources within the planning area are considerable, although the information varies according to resource type and locale. Furthermore, understanding of the impacts on and the interplay among these resources is evolving. As knowledge improves, management measures (adaptive or otherwise) would be considered to reduce potential cumulative impacts in accordance with law, regulations, and Judith Resource Area Resource Management Plan and Headwaters Resource Management Plan.

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

National Greater Sage-Grouse planning strategy	The BLM and Forest Service are preparing several EISs with associated plan amendments to address a range of alternatives focused on specific conservation measures across the range of the GRSG. Several on-going RMP revisions will also be addressing specific conservation measures. The amendments will be coordinated under two administrative planning regions across the entire range of the GRSG; Rocky Mountain Region and the Great Basin Region. The Rocky Mountain Region consists of land use plans in North Dakota, South Dakota, Wyoming, and Colorado and in portions of Montana and Utah. The Great Basin Region consists of land use plans in California, Nevada, Oregon, and Idaho and in portions of Utah and Montana.
Other land use plans	The Judith Resource Area Resource Management Plan (BLM 1994) and Headwaters Resource Management Plan (BLM 1984) set management, protection, and use goals and guidelines for the Lewistown and Butte Field Offices and are currently being revised in a new RMP planning effort. The expected decision date for the revised LFO Resource Management Plan is 2016. The Billings, Miles City, and South Dakota Field Offices and Hi-Line District Office are also currently revising their RMPs. Those three plans are expected to be completed in 2014.
Energy and minerals development	<u>Oil and Gas Leasing.</u> The BLM routinely offers land parcels for competitive oil and gas leasing to allow exploration and development of oil and gas resources for public sale. Continued leasing is necessary for oil and gas companies to seek new areas for oil and gas production, or to develop previously inaccessible/uneconomical reserves. Since 1988, the LFO has been deferring nominated oil and gas lease parcels that require a special lease stipulation to protect important wildlife values. These deferrals are based on a protest resolution decision associated with existing RMPs in place for the field office. There are currently 55,880 acres of existing BLM surface/federal minerals and 33,881 acres of private state, or other surface/federal mineral leases within the RMPA planning area.
Vegetation Management	17, 437 acres of vegetation treatments were recorded in the LFO from 2002-2012. Treatments include prescribed fire, weed control and mechanical treatments such as thinning, mastication, twist-spiking, and restoration of non-native fields. <u>Hazardous fuels reduction.</u> Fuels treatments, including prescribed fires, chemical and mechanical treatment, and seeding, would likely continue and potentially increase in the future. Approximately 1,000 acres of crested wheatgrass restoration, clubmoss and mechanical treatments have been proposed. Approximately 129,000 acres of prescribed fire and maintenance burning have been proposed and could potentially be implemented within the life of this plan.
Livestock grazing	Livestock grazing has a long history in the region. Generally, livestock use has decreased over the past 100 years. Grazing in portions of the RMPA planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable between 2002 and 2012. Grazing on private lands within the RMPA planning area is expected to remain stable or slightly decrease as residential and recreational development increases. Drought and water availability in the planning has a significant impact on livestock grazing.  Infrastructure constructed on BLM-administered lands to support livestock

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

	<p>grazing within the 5-county planning area from 2002-2012 is as follows:</p> <ul style="list-style-type: none"> <li>• 26 miles of stockwater pipeline</li> <li>• 42 watering sites which may include reservoirs, reservoir reconstructions, pits, or stocktanks</li> <li>• eight cattleguards</li> <li>• 58 fences which may include 3-wire, 4-wire, woven or electric fence totaling 97.4 miles.</li> </ul> <p>The following range improvement projects have been proposed within the planning area:</p> <ul style="list-style-type: none"> <li>• 21 fences totaling 65 miles; three miles are proposed for removal</li> <li>• 84 miles of stockwater pipeline (estimated)</li> <li>• 87 stockwatering sites</li> </ul>
Recreation and visitor use	<p>The primary recreational activities in the LFO are hunting, fishing, hiking, horseback riding, sight-seeing, and target shooting. Recreation-based visitor use in the LFO is expected to maintain or increase on BLM- and non-BLM-administered lands.</p> <p><u>Unauthorized travel.</u> Travel off of designated or existing routes as well as the creation of social trails has occurred and would likely continue to occur within the decision area.</p>
Lands and realty	<p>Applications for ROW authorizations may increase to accommodate development, such as residential development and communication site usage for public safety and homeland security. In the project planning area (five counties), the number of ROW actions (based on authorizations) has steadily increased since 2006 (seven) to a high of 17 in 2009 and mostly recently there were 14 in 2012. The average for the past five years is approximately 13 actions per year. The FY2012 actions included:</p> <ul style="list-style-type: none"> <li>• One temporary use (film) permit for 5.0 acres of temporary occupancy;</li> <li>• Five road ROWs for 10.5 acres of disturbance;</li> <li>• One communication site ROW for 0.04 acres of disturbance</li> <li>• Two powerline ROWs for 1.6 acres of disturbance;</li> <li>• Three buried telecommunications ROWs for 58.8 disturbed acres; and</li> <li>• Two ROWs classified as 'other' (snow fence and weather station) for 0.19 acres of disturbance.</li> </ul> <p>Total 2012 surface disturbance of approximately 76.1 acres.</p> <p>Thus far in 2013 LFO has authorized ROW authorizations which include eight actions:</p> <ul style="list-style-type: none"> <li>• One powerline ROW in Chouteau County which is partial buried and partial overhead for 16.8 acres of disturbance</li> <li>• One powerline ROW in Petroleum County which is overhead (replacing an overhead line) for 20.3 acres of disturbance</li> <li>• Two film permits in Fergus County for 34,296.2 acres of temporary surface occupancy</li> </ul>

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

	<ul style="list-style-type: none"> <li>• One road ROW in Fergus County for 3.6 acres of disturbance</li> <li>• Two renewals of ROWs for telecommunications in Fergus County, one buried for 0.8 acres and one overhead service pole for 0.1 acres of disturbance</li> <li>• One ROW for buried telecommunications line in Fergus County for 1.2 acres of disturbance</li> </ul> <p>Total 2013 surface disturbance of approximately 34,339 acres (34,296 of which is temporary surface occupancy)</p> <p>Currently, there are seven land decisions in a pending status. These applications include:</p> <ul style="list-style-type: none"> <li>• One land exchange in Petroleum County for 240 acres</li> <li>• One land donation in Chouteau County for 760 acres</li> <li>• One land donation in Chouteau County for approximately 120 acres</li> <li>• Two road ROW applications in Fergus County for approximately 3 acres</li> <li>• Three road ROW applications in Petroleum County for approximately 7 acres</li> </ul> <p>Total of surface disturbance of approximately 1,130 acres</p> <p><b>All data for this ROW section is for the project planning area only – (five counties) and does not include all eight counties covered by the LFO.</b></p> <p><i>Some ROWs will encumber land in more than one county. When more than one county is involved in a ROW, it may physically cover more than one county, or a township/range may be split among two counties and the computer system will note all counties rather than one or the other. In order to accurately record acres, acreage is reported total for the ROW, not for all counties involved.</i></p> <p><i>ROWs have specific size or geographic locations. For instance, a ROW may cover a two-track road which physically covers approximately 15 feet wide by a certain length. However, the ROW may authorize a width of 20 feet in width in order for maintenance to be completed. Therefore, the ROW acreage calculation will be based on the 20 feet rather than the 15 feet, which will appear to be a higher number of acres disturbed than what is actually disturbed on the ground. This is truer with utility services. While a powerline may only physically occupy a 5-foot strip, but have a 30-foot wide ROW. Using this example, a five 5-foot ROW for five miles would actually only have approximately 3.03 acres of acres disturbed, yet the authorization document (and calculations above) would reflect the 30-foot wide strip or 18.18 acres.</i></p>
Spread of noxious/invasive weeds	Noxious weeds have invaded and would continue to invade many locations in the planning area. Noxious weeds are carried by wind, humans, machinery, and animals. The LFO currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, manual, and educational methods, primarily through the implementation of Weed Control Cooperative Range Improvement Agreements. The 1991 and 2007 RODs for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991), and the 2007 Programmatic Environmental Report (BLM 2007a), guide the management of noxious weeds in western states.
Wildland fires	From 2002-2012, there have been 324 wildfires documented on all lands within the LFO. 40,782 acres of human caused fires and 91, 702 acres of naturally occurring wildfires were reported during this time. Wildfires have been widely distributed in terms of frequency and severity.

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

	Increasing recurrence and severity of drought conditions have been predicted for this area as a result of climate change. This could, in turn, increase the occurrence and severity of wildfires on BLM-administered land.
Spread of forest insects and diseases	Several years of drought in western states have resulted in severe stress on forests. This stress has made trees less able to fend off attacks by insects such as mountain pine beetles. In recent years, forest diseases and infestations have been widespread throughout Montana.
Drought	For much of the last decade, most of the western US has experienced drought. Crop production, rangeland, riparian and forest health are all impacted by drought.
Climate change	Increased concern over GHG emissions and global warming issues may lead to future federal and state regulations limiting the emission of associated pollutants.

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

## **5.2 GREATER SAGE-GROUSE**

The cumulative effects analysis study area extends beyond the planning area boundary and consists of WAFWA MZs I and IV. This draft RMPA/EIS contains a quantitative cumulative effects analysis for GRSG habitat within the planning area boundary. At the larger WAFWA management zone level, the analysis is primarily qualitative in nature. Data and information to enable a more comprehensive quantitative analysis may become available between the draft and final RMPA/EIS and may include the following: ongoing land use plan amendments and revisions, state plans that may not yet be completed, coordination with states and agencies during consistency reviews, and data from non-BLM-administered lands. Those data that become available will be compiled and included in the quantitative cumulative effects analysis for GRSG in the final EIS.

The timeframe for this analysis is ten years. The assumptions and indicators follow those established for the analysis of direct and indirect effects in **Chapter 4**.

### **5.2.1 WAFWA Management Zone I Analysis**

According to the COT report (USFWS 2013), the four most substantial threats to GRSG habitats and populations occurring across populations in this WAFWA management zone include energy development, infrastructure, grazing impacts, and spread of weeds. MZ I consists of four GRSG populations in relatively large regions: the Dakotas, northern Montana, the Powder River Basin, and the Yellowstone Watershed (Garton et al. 2011), and includes the majority of lands covered by this RMPA. The known threats to the Yellowstone Watershed

Population that are present and widespread include agriculture conversion, weeds and annual grasses, energy, infrastructure, and grazing. Threats that are present but localized in the Yellowstone Watershed Population include elimination of sagebrush, fire, conifers, and recreation (USFWS 2013, p. 17).

Privately owned lands make up 66 percent of sagebrush in the Great Plains, with BLM-administered land making up 17 percent (Knick 2011). This management zone contains some of the highest-connected network of GRSG leks in the range (Knick and Hanser 2011), but also contains less productive sagebrush, similar to areas where GRSG have been extirpated (Wisdom et al. 2011). Sagebrush cover is naturally limited due to the preponderance of grassland ecosystems and, with agricultural pressure and energy production, results in substantial habitat limitations for GRSG populations.

Regional assessments estimated that 7.2 percent of PH and GH in MZ I are directly influenced by agricultural development, and over 99 percent of these habitats are within approximately four miles of agricultural land. Less than one percent of GRSG habitats are directly influenced by a natural gas or oil wells, but nearly all lie within 12 miles of a well in the estimated effects area (Johnson et al. 2011). Approximately 6.3 million acres (14 percent) of GRSG habitat is currently leased for the development of federal fluid minerals. Most GRSG habitats within the management zone have the potential to be influenced by coal mining and geothermal energy development, although coal and mineral developments directly influence less than one percent of the lands in the region.

Conversion of sagebrush habitat to agricultural use, or sodbusting, causes loss of habitat available for GRSG use. Habitat loss also decreases the connectivity between seasonal habitats, increasing population isolation and fragmentation. Fragmentation then increases the probability for decline of the population, reduced genetic diversity, and extirpation from stochastic events (Knick and Hanser 2011). In addition to reducing the land area available to support GRSG, habitat loss and fragmentation also increase the likelihood of other disturbances, such as human traffic, wildfire, and spread of invasive plants.

Isolation, wildfire, recreation, and other factors also threaten GRSG in this region, but are of less concern than the four major factors listed above, and are not discussed in detail in this section.

**Table 5-1** lists past, present, and reasonably foreseeable actions that would affect the planning area and vicinity. There are currently 55,880 acres of existing BLM-administered surface minerals and 33,881 acres of federal subsurface mineral leases within the planning area. Since 1988, the LFO has been deferring nominated oil and gas lease parcels that require a special lease stipulation to protect important wildlife values.

From 2002 to 2012, 17,437 acres of vegetation treatments were recorded in the planning area, including prescribed fire, weed control and mechanical

treatments such as thinning, mastication, twist-spiking, and restoration of non-native fields. Future projects would continue these activities. Fuels treatments are also likely to continue and potentially increase in the future. Approximately 1,000 acres of crested wheatgrass restoration, clubmoss, and mechanical treatments have been proposed. Approximately 129,000 acres of prescribed fire and maintenance burning have been proposed and could be implemented over the life of the RMPs.

Grazing in portions of the planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable between 2002 and 2012. Grazing on private lands within the planning area is expected to remain stable or slightly decrease as residential and recreational development increases. Infrastructure constructed on BLM-administered lands to support livestock grazing from 2002 to 2012 included 26 miles of stockwater pipeline, 42 watering sites, and 58 fences totaling 97.4 miles. Range improvement projects have been proposed within the planning area, including 21 fences totaling 65 miles, 84 miles of stockwater pipeline (estimated), and 87 stockwatering sites.

Recreation-based visitor use in the planning area is expected to continue at current levels or increase on BLM-administered and non-BLM-administered lands. The primary recreational activities in the planning area are hunting, fishing, hiking, horseback riding, sight-seeing, and target shooting. Travel off of designated or existing routes as well as the creation of social trails has occurred and would likely continue to occur within the decision area.

Applications for ROW authorizations may increase to accommodate development, such as residential development and increased use at communication sites, and some permits that do not require surface-disturbance (i.e., filming productions). In the planning area, ROW actions have steadily increased from seven in 2006 to a high of 17 in 2009; there were 14 in 2012. Thus far in 2013, the LFO has approved authorizations for eight actions resulting in a total of 34,339 acres of temporary surface disturbance (34,296 of which is temporary surface occupancy; therefore, not all of these acres would be disturbed), including 43 acres of permanent disturbance from powerline and road ROWs (see **Table 5-1**). Currently, seven land actions are pending for a total of approximately 1,130 acres of surface disturbance.

Noxious weeds have invaded and would continue to invade many locations in the planning area, carried by wind, humans, machinery, and animals. The BLM manages weed infestations through integrated weed management, including biological, chemical, mechanical, manual, and educational methods.

There have been 324 wildfires documented on all lands within the LFO between 2002 and 2012. During this time, 40,782 acres of human-caused fires and 91,702 acres of naturally occurring wildfires were reported. Wildfires have been widely distributed in terms of frequency and severity. An increasing trend of wildland

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

### ***Other Regional Efforts***

The MFWP's Montana Management Plan and Conservation Strategy for Sage Grouse (2005) seeks to protect, maintain and restore GRSG habitat. The plan prioritizes threats to the species across the state and provides an overall strategy for public and private cooperation in conservation actions.

MFWP is implementing the WAFWA Sage-Grouse Strategy across management zones. The WAFWA Sage-Grouse Strategy includes monitoring, research, outreach, and funding of conservation projects for GRSG. A basic premise of the WAFWA Sage-Grouse Strategy is that additional conservation capacity must be developed at all levels (local, state and agency, and range-wide) for both the short term (first three to five years) and for the long term to ensure GRSG conservation.

The SGI is working with private landowners in 11 western states to improve habitat for GRSG while simultaneously improving working ranches (Manier et al. 2013). With approximately 31 percent of all sagebrush habitats across the range in private ownership (Stiver 2011, p. 39), a unique opportunity exists for NRCS to benefit GRSG and ensure the persistence of large and intact rangelands through implementation of the SGI (USFWS 2010b, p.5).

Participation in the SGI program is voluntary, but willing participants enter into binding contracts or easements to ensure that conservation practices that enhance GRSG habitat are implemented (USFWS 2010b). Though participation is voluntary, not a traditional regulatory approach, participating landowners are bound by contract (usually three to five years in duration) to implement, in consultation with NRCS staff, conservation practices if they wish to receive the financial incentives offered by the SGI. These financial incentives generally take the form of payments to offset costs of implementing conservation practices and easement or rental payments for long-term conservation (USFWS 2010b). While potentially effective at conserving GRSG populations and habitat on private lands, incentive-based conservation programs that fund the SGI generally require reauthorization from Congress under subsequent Farm Bills. These funding streams are potentially variable as they are subject to the political process. As of 2012, the SGI has secured conservation easements on 208,023 acres across the GRSG range (Manier et al. 2013, p. 119) with the largest percentage of easements occurring in Wyoming (120,706 acres).

### ***Energy Development***

As discussed in **Chapter 4**, oil and gas development impacts GRSG and sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors;

indirect disturbances result from noise, gaseous emissions, changes in water availability and quality, and human presence. The interaction and intensity of effects could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005).

There is an existing protest resolution decision affecting lands managed within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PPH and PGH, or PH and GH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS. Under all alternatives, future leasing is being deferred in this RMPA. Therefore, there would be no impacts on GRSG from future oil and gas leasing.

Despite deferment of BLM-administered lands for oil and gas leasing within GRSG habitat, existing leases remain valid across GRSG ranges in MZ I, with potential for development based on locations of geologic fields for traditional oil and gas distributed extensively across eastern portions of GRSG range (Manier et al. 2013). The Dakotas population in MZ I is heavily influenced by oil and gas development, and oil and gas developments are scattered throughout the Yellowstone watershed area (USFWS 2013, p. 63). The Powder River Basin contains substantial energy resources, including oil, natural gas and coal bed natural gas (USFWS 2013, pp. 64-65), while the northern Montana population has little energy development. Mining of various federal mineral resources currently directly affects approximately 3.5 percent of potential GRSG habitat with indirect effects potentially affecting larger portions in some areas.

The primary oil and gas fields within the planning area are largely played out; therefore, the level of activity on existing leases within the planning area is likely to remain relatively stable. The one possible exception is the Heath shale play, where activity on leases is still in early stages. If this play proved to be economic, drilling and production in the vicinity of the play in southern Petroleum County could greatly increase.

Total acreage open to locatable mineral development would remain unchanged under Alternatives A and D. Under Alternative B, PH would be recommended for withdrawal from locatable mineral entry, and, under Alternative C, both PH and GH would be recommended for withdrawal. No locatable mineral development is anticipated in the next 20 years, so these changes would not impact GRSG.

**Table 5-1** does not describe future oil or gas projects in the planning area but does state that in unleased areas, federal leases would be deferred to protect wildlife habitat. However, Alternatives B, C, and D limit leased mineral estate

drilling in PH to exploration intended to provide information on resources located outside PH. Management under Alternative C further stipulates that exploration would be subject to seasonal restrictions precluding activities in GRSG breeding, nesting, and brood-rearing habitat. Management under Alternative C provides the strictest limits on leased fluid minerals and would be most protective of GRSG habitat on BLM-administered lands. Under Alternatives B and D, the BLM would provide substantial improvement in oversight of GRSG habitat compared to Alternative A. However, given the extent of oil and gas resources present in the Dakotas, Powder River Basin and Yellowstone watershed, development pressure is likely to continue, and despite the safeguards offered under Alternatives B, C, or D on leased federal mineral estate, remain a substantial threat to GRSG populations in these areas because development on lands not requiring federal leases would continue.

### **Infrastructure**

As discussed in **Chapter 4**, power lines can directly affect GRSG by posing a collision and electrocution hazard, and can indirectly decrease lek attendance and recruitment by providing perches and nesting habitat for potential avian predators, such as golden eagles and ravens (Connelly et al. 2004). In addition, power lines are linear and often extend for many miles. Thus, ground disturbance associated with construction, as well as vehicle and human presence during maintenance activities, may introduce or spread invasive weeds over large areas, thereby degrading habitat. Impacts from roads may include direct habitat loss from road construction and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats, facilitate predator movements, spread invasive plants, and increase human disturbance from noise and traffic (Forman and Alexander 1998).

Under Alternative A, the BLM would maintain current management which includes no ROW exclusion areas. Under Alternative B, the BLM would manage all PH as a ROW exclusion area, and GH as a ROW avoidance area. Under Alternative C, the BLM would manage both PH and GH as ROW exclusion areas. Under Alternative D, the BLM would manage PH as ROW avoidance areas, and would not create any exclusion areas. The BLM's approach under Alternative D is intended to preserve management flexibility to site ROWs in areas where they would have minimal impact. This flexibility may be advantageous where federal and private land-ownership areas are mixed, such as in the Yellowstone watershed area. Furthermore, ROW exclusion areas could result in more widespread development on private lands, and may not reduce overall impacts on sagebrush habitat.

As indicated in **Table 5-1**, ROW applications continue to increase in the planning area, and many new road and power line projects are anticipated to support residential developments and communication sites, and possibly energy developments as well. By designating ROW avoidance and exclusion areas, the BLM would reduce or minimize impacts from infrastructure, as new ROWs

would be prohibited (ROW exclusion) or would be sited to avoid sensitive areas (ROW avoidance), or designed to otherwise reduce or minimize direct and indirect effects to GRG. Renewals or upgrades of existing facilities could incorporate additional conservation actions. Collocation or clustering of facilities would reduce impacts on GRSG habitat and would prevent disturbance in new areas.

The restrictions in Alternatives B and C would prohibit ROWs from being located in PH, while Alternative D would avoid siting ROWs in PH if possible, preserving management flexibility. Alternative A would not restrict the siting of ROWs, though existing policy does recommend collocating ROWs when possible. Management under Alternatives B, C, or D would benefit GRSG more than Alternative A by siting ROW infrastructure such that it minimizes loss and fragmentation of habitat, predation risk, and other threats.

Habitat connectivity is threatened by existing roadways in the Yellowstone watershed and Powder River Basin areas; the Dakotas populations are isolated but may have east-west connectivity to populations in Montana (USFWS 2013, p. 63). The alternatives do not vary the acreage of habitat restricted to existing roads, but the ROW avoidance and exclusion areas established under Alternatives B, C, or D would protect GRSG habitat more than current management (Alternative A). Thus, the action alternatives may be more protective of GRSG populations from impacts associated with roads.

### ***Spread of Weeds***

Invasive and noxious weeds have invaded and would continue to invade many locations in the planning area, carried by wind, humans, machinery, and animals. As discussed in **Chapter 4**, invasive weeds alter plant community structure and composition, productivity, nutrient cycling, and hydrology and may cause declines in native plant populations, including sagebrush habitat, through competitive exclusion and niche displacement, among other mechanisms. Invasive plants reduce and may eliminate vegetation that GRSG use for food and cover. Along with competitively excluding vegetation essential to GRSG, invasive weeds fragment existing GRSG habitat or reduce habitat quality. Invasive weeds can also create long-term changes in ecosystem processes, such as fire-cycles and other disturbance regimes that persist even after an invasive plant is removed (Connelly et al. 2004).

As described in **Table 5-1**, the LFO currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, manual, and educational methods, guided by the 1991 and 2007 RODs for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991), and the 2007 Programmatic Environmental Report (BLM 2007a).

Under Alternative A, the BLM would utilize integrated weed management techniques, including mechanical, manual, chemical, and biological control to reduce the likelihood of invasive weed spread and the extent of current

infestations. This is accomplished primarily through the implementation of Weed Control Cooperative Range Improvement Agreements with affected permittees/lessees. Weed control is intimately tied to protecting land from the threat of fire, and fuels management actions can also reduce weeds and create fire breaks.

Under all alternatives, integrated vegetation management would be used to control, suppress, and eradicate noxious and invasive species. Under Alternatives B, C and D, vegetation management and restoration would prioritize sagebrush re-establishment and weed control as part of habitat management. Alternatives A, B and D would consider noxious weed control in grazing management. Under Alternative C the BLM would lose the ability to implement Weed Control Cooperative Range Improvement Agreements for the control of noxious and invasive weeds on BLM-administered land. Apart from the grazing reductions in Alternative C, methods, approaches, and resources for weed control would be similar under all alternatives.

Although cheatgrass and other introduced brome occur in this region, they do not currently appear to pose a risk of large-scale invasion as long as management of habitat areas is maintained.

### **Grazing**

Livestock grazing (cattle) is the dominant agricultural use in the LFO. If not managed optimally or effectively, cattle and sheep grazing can cause soil compaction, nutrient enrichment, vegetation and nest trampling, direct disturbance, and negatively effects on GRSG recruitment, by reducing invertebrate prey or increasing exposure to predators (Beck and Mitchell 2000, pp. 998-1,000; Knick 2011; Coates 2007, pp. 28-33). Grazing in riparian areas can cause stream and river bank destabilization, loss of riparian shade, and increased sediment and nutrient loads in the aquatic ecosystem (George et al. 2002). Stock watering tanks can contribute to dewatering of streams and aquifers, and may concentrate livestock movement and congregation in sensitive areas (Vance and Stagliano 2007).

In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. As a result, livestock grazing could cause changes in habitat that alter species abundances and composition in GRSG insect prey. Changes could occur in varying degrees in plant composition and change in vegetative structure, affecting cover for nesting birds. Grazing could also alter fire regimes (Davies et al. 2010).

Periodic overgrazing can damage range resources for the long term, and overgrazing often exacerbates drought effects when stocking levels are not quickly reduced to match the limited forage production. The degree to which grazing affects habitat depends on several factors, including the number of animals grazing in an area, the time of grazing, and the grazing system used. A well-developed understory of grass, forbs, and deciduous shrubs is critical for

GRSG and other wildlife. Impacts on habitat vary with livestock densities and distribution: the more evenly livestock is distributed, the lower their impact on any given area (Gillen et al. 1984). However, cattle show a strong preference for certain areas, leading to high use in some areas and little to no use in others. Steep slopes (greater than 30 percent), dense forests and vegetation, poor or little upland forage, and lack of water generally limit use by livestock.

Grazing can reduce the spread of invasive grasses, if applied annually before the grasses have cured, and can be used as a tool to reduce fuel load (Connelly et al. 2004, p. 7 and pp. 28-30). Light to moderate grazing does not appear to affect cover of perennial grasses important to nest cover (Strand and Launchbaugh 2013; Reisner et al. 2013).

Livestock grazing is not considered a substantial threat to GRSG in the LFO because grazing systems have been implemented on most allotments to provide for GRSG habitat needs throughout the year. Grazing in portions of the planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable over between 2002 and 2012. Grazing on private lands within the planning area is expected to remain stable or slightly decrease as residential and recreational development increases. Infrastructure constructed on BLM-administered lands to support livestock grazing from 2002 to 2012 included 26 miles of stock-water pipeline, 42 watering sites, and 58 fences totaling 97.4 miles. Range improvement projects have been proposed within the planning area, including 21 fences totaling 65 miles, 84 miles of stock-water pipeline (estimated), and 87 stock-watering sites.

Alternative A would continue current management of grazing, range management and noxious weed control in GRSG habitat. Under Alternatives B and D, acreage open to grazing and AUMs would remain the same as under Alternative A, but AMPs, integrated ranch planning, and land health assessments would be used to incorporate GRSG management objectives into grazing permit renewals.

Management under Alternative C would remove livestock grazing from all allotments in PH and GH, for a total of 337,165 acres closed to grazing in the decision area, on 305 allotments with 69,408 removed AUMs. Removing grazing could limit the loss of herbaceous cover, potential for trampling, and other effects on GRSG. However, removal of grazing could contribute to the occurrence of large-scale wildfire, and reduce noxious weed control efforts. In addition, no-grazing areas on BLM-administered land would require more than 3,000 miles of additional fencing to separate these areas from adjacent grazing lands, which would increase the adverse effects of fencing on GRSG, such as raptor predation, collision and habitat fragmentation.

Because most grazed land in GRSG habitat in MZ I is privately owned, restrictions on grazing on BLM-administered land may have a limited direct effect on population areas. However, the no-grazing areas on BLM-administered

land could increase the indirect adverse effects on GRSG, including the potential conversion of adjacent private grazing lands to agriculture. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for GRSG that inhabit rangeland outside of BLM-administered lands. Temperature increases resulting from climate change may increase crop yields, encouraging lands not previously used for agriculture to be converted for that purpose (NRC 2010).

### 5.2.2 WAFWA Management Zone IV

According to the COT report (USFWS 2013), the four most substantial threats to GRSG habitats and populations occurring across populations in this WAFWA management zone are spread of weeds, fire, grazing impacts, and isolation/small size. MZ IV consists of nine GRSG subpopulations in the Snake River Plains: East-central Idaho, southwest Montana, Snake-Salmon-Beaverhead, Belt Mountains, Weiser, northern Great Basin, Box Elder and Sawtooth (Garton et al. 2011). The LFO includes a small portion of the Belt Mountains population. The known threats to the Belt Mountains Population that are present and widespread include isolated/small size population, agriculture conversion, weeds/annual grasses, and grazing. Threats that are present but localized in the Belt Mountains Population include sagebrush elimination, fire, conifers, energy, infrastructure, recreation, and urbanization (USFWS 2013).

The area has a long history of agricultural land uses and the majority of highly productive lands have been converted to agricultural use, resulting in a sagebrush landscape that is drier and less productive than those of past eras (Manier et al. 2013). As a result, most populations in the region are small or isolated, with the exception of central Idaho (watershed of the Snake-Salmon-Beaverhead Rivers) and the northern Great Basin population (USFWS 2013). Habitat availability is a primary limiting factor in this region due to the combination of land use change, leading to fragmentation and isolation, and disturbances, primarily wildland fire (Manier et al. 2013).

The majority of the sagebrush in this management zone is federally managed (Knick 2011), but local project impacts may be more important than range-wide effects because of habitat quality and connectivity at the local scale.

Few oil and gas wells exist in the management zone, and less than 350,000 acres (one percent) of GRSG habitats are currently leased for federal fluid mineral exploration. Coal and solar potential are also low throughout the management zone. Agricultural development influences one percent of the management zone and 85 percent of PH and GH are within 6.9 km (4.3 mi) of cropland (Manier et al. 2013).

**Table 5-1** lists past, present and reasonably foreseeable actions that would affect the planning area and vicinity. Planned projects in the LFO and other regional efforts for GRSG conservation in MZ IV are discussed above under MZ I.

**Spread of Weeds**

Spread of weeds is considered a present and widespread threat across the Montana part of MZ IV, and a present but localized threat in some parts of Idaho (USFWS 2013).

Under Alternative A, the BLM utilizes integrated weed management techniques, including mechanical, manual, chemical, and biological control to reduce the likelihood of invasive weed spread and the extent of current infestations.

Under all alternatives, integrated vegetation management would be used to control, suppress, and eradicate noxious and invasive species. Under Alternatives B, C and D, vegetation management and restoration would prioritize sagebrush re-establishment and weed control as part of habitat management. Alternatives A, B and D consider noxious weed control in grazing management. Under Alternative C, the BLM would lose the ability to implement Weed Control Cooperative Range Improvement Agreements for the control of noxious and invasive weeds on BLM-administered land. Apart from the grazing reduction in Alternative C, methods, approaches, and resources for weed control would be similar under all alternatives.

**Grazing**

In MZ IV, improper grazing management is considered a particular threat in Southwest Montana. Alternative A would continue current management of grazing, range management and noxious weed control in GRSG habitat. Under Alternatives B and D, acreage open to grazing and AUMs would remain the same as under Alternative A, but AMPs, integrated ranch planning, and land health assessments would be used to incorporate GRSG management objectives into grazing permit renewals.

Under Alternative C, grazing would be reduced in PH and GH by approximately two-thirds of present AUM levels. Reduction of grazing could limit the loss of herbaceous cover, potential for trampling, and other effects of GRSG. However, removal of grazing could contribute to the occurrence of large-scale wildfire, and reduce noxious weed control efforts. In addition, no-grazing areas on BLM-administered land would require additional fencing to separate these areas from adjacent grazing lands, which would increase the adverse effects of fencing on GRSG (e.g., raptor predation, potential collision, and habitat fragmentation).

**Fire**

Sagebrush is killed by wildfires and recovery requires many years, especially in the case of large fires (Connelly et al. 2004). Contiguous old-growth sagebrush sites are at high fire risk, as are large blocks of continuous dead sagebrush. Prior to recovery, these sites are of limited use by GRSG except along the edges in unburned islands. As a result of this loss of habitat, fire has been identified as a primary factor associated with GRSG population declines. In addition, fires can result in a reduction of invertebrate food sources and may facilitate the spread of invasive weeds. While most sagebrush subspecies are killed by fire and slow

to re-establish, cheatgrass recovers within one to two years of a fire event from seed in the soil, leading to a re-occurring fire cycle that prevents sagebrush reestablishment (USFWS 2010).

Wildfire has been a primary threat to GRSG habitats and populations occurring across MZ IV, resulting in habitat loss and fragmentation (USFWS 2013). Over the last decade (2001 to 2011), more than 3.8 million acres (10 percent of PH and 13 percent of GH) of GRSG habitats have burned in this management zone, with an average of more than 237,000 acres of PH burned annually, with more than one million acres burned in some years. The Murphy Fire in Idaho and Nevada affected over 650,000 acres of habitat in this management zone in 2007 (USFWS 2013). Additionally, 81 percent of the region is considered at high risk for fire. Approximately 8.5 million acres (26 percent) spread throughout MZ IV is also considered high risk for cheatgrass invasion. Climate change is expected to increase the risk of wildfire throughout the state (NRC 2010).

Under Alternative A, prescribed burning may be used to achieve habitat objectives. The action alternatives (Alternatives B, C, and D) provide for similar protection and maintenance of sagebrush habitat in implementing prescribed burning. Alternatives B, C, and D have similar approaches to prioritizing sagebrush protection in fuels treatment programs. Alternatives B and D also consider the utility of livestock grazing as a tool in fuels management. Compared to Alternative A, Alternatives B, C, and D would all provide an increase in protection for sagebrush in prescribed burning, fuels treatment and fire suppression, with Alternatives B and D providing more management flexibility in fire prevention.

#### ***Isolation/Small Population Size***

The Snake River Plain as a whole represents one of the larger areas of habitat connectivity and supports the largest GRSG population outside of the Wyoming Basin in the northern Great Basin (Garton et al. 2011). However, some subpopulations within MZ IV, such as Baker, East-central Idaho, Sawtooth, and Weiser and Belt Mountains, are small and isolated with little connectivity to other populations. These areas have been isolated by extirpation of neighboring populations or conversion of sagebrush habitat to agricultural fields or human developments. Isolation in small habitats decreases the connectivity between seasonal habitats, potentially resulting in the loss of the population. Isolation increases the probability for the loss of genetic diversity and extirpation from stochastic events, such as disease or storm damage (Knick and Hanser 2011). In addition to reducing the land area available to support GRSG, habitat loss and fragmentation also increase opportunities for other disturbances. Development and land use changes increase the risk of threats to GRSG and their habitat from human traffic, wildfire, and spread of invasive plants.

While population isolation is not directly tied to BLM management, land tenure decisions, such as acquisitions and disposals, can improve connectivity and

minimize the adverse effects of isolation. For example, if the BLM disposes of a land parcel of sagebrush-steppe, it could potentially be converted to farmland or sub-divided into home sites, where lands retained in BLM management would not be converted to non-habitat uses. Temperature increases resulting from climate change may increase crop yields, which may increase pressure for agricultural conversion in parts of the state not previously used for that purpose (NRC 2010). Other BLM protective actions, such as fire suppression or co-locating ROWs, would provide extra protection to isolated populations, which can least afford to lose individuals or have reduced recruitment rates.

Under Alternatives B, C, and D, the BLM would provide for protection of GRSG habitat from disposal, and would recommend acquisition of private lands, when offered and where possible, to increase GRSG habitat and improve connectivity. Under Alternative A, the BLM does not make a specific recommendation for acquisitions but does include wildlife habitat value as one of the criteria when considering any land in a land tenure decision. Alternatives B, C, and D are more protective of isolated GRSG habitat than current policy under Alternative A.

### **5.2.3 Conclusions**

Under Alternative A, current management would continue on BLM-administered lands in MZs I and IV. There would be no PH or GH designated, no additional ROW avoidance or exclusion areas established, and no restrictions on leased fluid mineral estate to protect GRSG from surface disturbing activities or infrastructure. Additional ROW authorizations may not directly increase disturbance but could increase the activity or indirect effects on non-BLM-administered lands. Oil and gas development and associated infrastructure would be harmful to populations in the Powder River Basin and the Dakotas, where energy resources are plentiful and GRSG at risk of decline from habitat loss and fragmentation (USFWS 2013).

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

Under Alternative B, PH and GH would be designated ROW exclusion and avoidance area, potentially pushing planned transmission line construction onto non-BLM-administered land. Development of leased fluid minerals would be restricted in PH. Land disposals and acquisitions would focus on maintaining

sagebrush acreage and connectivity. GRSG habitat objectives would be considered in grazing management in PH, and fires would be suppressed in sagebrush areas. Alternative B would site transmission lines in a location that minimizes impacts on GRSG, compared to Alternative A. The planned vegetation management, weed control, and restoration projects would benefit the planning area, as described above. These approaches would reduce the impacts on GRSG from energy development and associated infrastructure on BLM-administered land, and provide more protection to GRSG from land disposals that could lead to loss of habitat. In conjunction with NRCS and state initiatives on private land, these approaches would benefit GRSG conservation.

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

Grazing would be removed in GRSG habitat areas under Alternative C, which would increase fine-fuel load. Though lessening over-grazing would reduce disturbance to GRSG, exclusion of livestock from BLM-administered land would require more than 3,000 miles of additional fencing, which would increase predation and collision risk, and contribute to fragmentation. An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for GRSG that inhabit rangeland outside of BLM-administered lands. Alternative C provisions would protect GRSG habitat from loss and fragmentation and limit human disturbance on BLM-administered land. However, due to the checkerboard pattern of land ownership in MZ I, these provisions could result in pushing developments onto adjacent private lands, increasing impacts on GRSG over the long term.

Under Alternative D, the BLM would improve GRSG habitat protection over current management, but with less restrictive actions than Alternatives B or C. The BLM would restrict leased fluid mineral development, similarly to Alternative B, and would establish ROW avoidance rather than exclusion areas. GRSG habitat objectives would be considered in grazing management in PH. Fires would be suppressed on sagebrush land, but prescribed burns may still be used. These provisions would protect GRSG more than current management does. The provisions would also maintain flexibility for land managers in areas

with mixed public and private ownership, where ROW exclusion areas could result in more widespread development on private lands, and not reduce overall impacts on sagebrush habitat. In conjunction with NRCS and state initiatives on private land, these approaches would enhance GRSG conservation.

While implementation of the action alternatives would reduce threats faced by GRSG in MZs I and IV, overall trends toward habitat loss and fragmentation are likely to continue, primarily due to energy and infrastructure development pressures in GRSG habitat, notably in the Dakotas and Powder River Basin in MZ I. The isolation of small populations makes them particularly vulnerable to disease and other stressors. The Yellowstone watershed also faces habitat loss pressure from energy and infrastructure development, and fragmentation risk due to the low percentage of land in public management. The northern Montana, northern Great Basin, and Snake-Salmon-Beaverhead Rivers subpopulations, are large, relatively intact areas of sagebrush mainly under public ownership, are largely resistant to these trends, and are at low risk of decline.

### 5.3 LANDS AND REALTY

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect the lands and realty programs are lands and realty actions, including foreseeable demand for renewable energy ROWs in response to national and international policies to mitigate climate change.

Land use authorizations in the planning area place the largest demand on the BLM lands and realty program and result in the greatest impacts. Over the past five years, the BLM issued ROW authorizations that have resulted in an average of 13 ROW actions per year. Past authorizations were primarily for linear features, such as roads, power lines, and telecommunication lines. The BLM has also issued three temporary use permits since 2012 for filming. Presently, the BLM is processing two road ROW applications in the planning area; one in Fergus County and the other in Petroleum County (see **Table 5-1**). Under all alternatives, a steadily increasing demand for ROWs to accommodate new power, water, and telecommunication lines; roadways; communication sites; and other similar development is expected. Any BLM management prescriptions that limit the BLM's ability to accommodate ROW development would influence the level of cumulative impacts on lands and realty and could potentially increase development on non-BLM administered land.

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

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

Under Alternatives B, C, and D, BLM management would include varying levels of ROW restrictions. Designations of areas as ROW avoidance or exclusion would neither impact existing ROW authorizations, nor ROW applications already being processed. The restrictions would, however, impact future ROW development. Alternative C would result in the greatest restriction on ROW development by designating PH and GH as a ROW exclusion area. Alternative B would prohibit ROW development in PH, while Alternative D would designate PH as ROW avoidance area. A prohibition on ROW development over a large area would prevent the BLM from accommodating the demand for new ROWs. Potential ROW applicants could choose to develop on non-BLM-administered land outside the planning area, which could increase environmental impacts on sensitive lands, increase permitting times, and decrease the overall effectiveness of the infrastructure system (e.g., power grid, telecommunication system, and roadway network).

National policies to mitigate climate change through the expansion of renewable energy production could also contribute direct and indirect long-term cumulative impacts on the lands and realty program in the planning area. There are 62,916 acres of viable wind resource areas (i.e., areas where the wind energy potential is greater than or equal to 400 watts per square meter) in the planning area, including nearly 7,000 acres of excellent (500 to 600 watts per square meter) or outstanding (greater than 600 watts per square meter) wind energy resource potential (BLM 2012a). As demand for renewable energy sources increases at the same time as wind energy technology, requests for ROWs to accommodate wind energy within the planning area are expected to increase. Wind energy development adjacent to BLM-administered lands would increase demand for transmission lines through the planning area. Any restrictions on ROW development would directly impact the lands and realty program, indirectly impact wind energy development in Montana, and when combined with other ROW demands, result in additional cumulative impacts on the BLM lands and realty program. The potential for cumulative impacts from wind energy ROW development in the planning area would be less under Alternative C, which would restrict ROW development in GRSG habitat, and Alternative D, which would prevent wind energy development in PH. However, these alternatives would force wind energy ROWs outside GRSG habitat and thereby increase demand for transmission line ROWs through the planning area.

#### **5.4 VEGETATION (INCLUDING NOXIOUS WEEDS; RIPARIAN AND WETLANDS)**

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect vegetation are vegetation management, noxious weed control, livestock grazing, energy development, and wildfire management.

Sagebrush-promoting vegetation treatments would protect native vegetation and overall ecosystem productivity, while reducing the distribution of invasive weeds and woody conifer species. Given the limited distribution of suitable sagebrush habitats and the cost of habitat restoration, management plans that protect intact sagebrush acreage and restore impacted areas strategically to improve habitat connectivity have the best chance of increasing the amount and quality of sagebrush cover (Manier et al. 2013).

An assortment of nonnative annuals and perennials and native conifers are currently invading sagebrush ecosystems. Many areas throughout the range of GRSG are at high risk from invasive plants; the most concentrated areas of risk include the Intermountain West and Great Basin (Manier et al. 2013). Invasive plants can alter plant community structure and composition, productivity, nutrient cycling, and hydrology, and may competitively exclude native plant populations. Invasive plant spread may result in habitat loss and fragmentation, and may also increase the risk of wildfire. The spread of invasive plants such as cheatgrass has increased the frequency and intensity of fires in some areas (Balch et al. 2012). Treatments designed to prevent encroachment of shrubs, non-native species or woody vegetation would alter the condition of native vegetation communities by changing the density, composition, and frequency of species within plant communities. The intent of these management programs is to improve rangeland condition and enhance sagebrush ecosystems.

Slow rates of re-growth and recovery of vegetation after disturbances (driven by low water availability and other constraints) coupled with high rates of disturbance and conversion to introduced plant cover have contributed to the accumulating displacement and degradation of the sagebrush ecosystem (Beck et al. 2009). Big sagebrush does not re-sprout after a fire, but is replenished by wind-dispersed seed from adjacent unburned stands or seeds in the soil. Depending on the species and the size of a burn, a return to pre-burn community cover can take 13 to 100 years (Connelly et al. 2004). When management reduces wildland fire frequency by controlling natural ignitions, the indirect impact is that vegetation ages across the landscape and early successional vegetation communities are diminished. Fire suppression may preserve condition of some vegetation communities as well as habitat connectivity. This is particularly important in areas where fire frequency has increased as a result of weed invasion, or where landscapes are highly fragmented. Fire suppression can also lead to increased fuel loads, which can lead to more damaging or larger-scale fires in the long term. Fire also increases

opportunities for invasive species such as cheatgrass to spread, so fire suppression can indirectly limit this expansion.

Controlled burning may be prescribed to treat fuel buildup and can assist in the recovery of sagebrush habitat in some vegetation types. Re-seeding with native plants and long-term monitoring to ensure the production of cover and forage plants would assist vegetation recovery (NTT 2011).

Livestock grazing may have both beneficial and detrimental aspects on rangeland vegetation, depending on site-specific management (USFWS 2010). At unsustainable levels, grazing can lead to loss of vegetative cover, decreased plant litter, increased soil erosion, and reduced habitat quality for wildlife (Knick 2011; Connelly et al. 2004). Properly managed, grazing can be used as a tool to reduce fuel load, reduce spread of noxious weeds, and protect intact sagebrush habitat (Connelly et al. 2004, p.7 and pp. 28-30). In areas meeting Rangeland Health Standards, grazing practices co-exist with healthy vegetation communities providing wildlife habitat. Grazing systems that aim to protect sagebrush and riparian ecosystems would allow more plant growth and reduce trampling and introduction of exotic species. Reducing or removing grazing in habitat areas would also reduce these effects but could have unintended consequences of increasing fuel buildup or degrading vegetation quality over the long term.

Oil and gas energy development impacts sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors; indirectly from gaseous emissions, changes in water availability and quality, and human disturbance. The interaction and intensity of effects could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005).

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

Energy development and ROW construction impacts sagebrush habitats through direct disturbance and vegetation loss from well pads and associated infrastructure, including access roads, power lines, and pipeline corridors; and vehicle use. The interaction and intensity of effects could cumulatively or individually lead to habitat fragmentation in the long term (Connelly et al. 2004; Holloran 2005). Staging areas, roads, ROWs, and other infrastructure also disturb vegetation and contribute to the risk of wildfire and introduction of noxious weeds. These trends would likely continue and increase given the energy and infrastructure development pressure in the planning area and the lack of specific management tools to mitigate them under Alternative A.

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

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

Alternative D is intended to preserve management flexibility while protecting GRS habitat. It would improve vegetation protection compared to current management, but with less limited actions than Alternatives B or C. Alternative D would establish ROW avoidance areas but not ROW exclusion areas. Prescribed burning and fuels management would take sagebrush vegetation into account. These provisions would maintain flexibility for land managers in areas with mixed public and private ownership, such as in the Yellowstone watershed area, where ROW exclusion areas could result in more widespread development on private lands, and not reduce overall impacts on sagebrush ecosystems.

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

## **5.5 WILDLAND FIRE MANAGEMENT AND ECOLOGY**

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

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

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

caused by drought. These cumulative circumstances may result in a greater need for flexibility in access to the planning area and in fire-suppression activities. The management actions under Alternative C that inhibit responses to and preventative treatments for wildland fire may struggle to meet the growing need for this flexibility in the future.

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

ROWs and the associated development may increase the risk of human-caused ignitions due to vehicular travel to and from the site, construction, maintenance, and operation of the facilities. An average of 13 ROW actions are authorized a year in the planning area (see **Table 5-1**). The development allowed under these authorizations would result in surface-disturbance, which would generally contribute to the modification of the composition and structure of vegetation communities in the vicinity of developed areas, which could then be more likely to fuel high-intensity fires. Additionally, decisions on seven land actions are still pending and would have the potential to increase the risk of wildland fire and consequently, increase the burden on wildland fire management in the future.

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

Minerals development under all alternatives would have similar impacts due to the lack of solid mineral potential in the area. Oil and gas leases requiring special wildlife stipulations in the LFO have been deferred in order to protect important wildlife habitat. This deferral indirectly effects wildland fire by reducing risks for wildland fire in the LFO because leases would not be offered within the planning area in the foreseeable future.

As the global effects of climate change continue into the future, the likelihood of natural, unplanned ignition within the planning area may increase due to the irregular weather patterns, increased likelihood of storms, and drought. As climate change is a global process, impacts on climate change from management actions related to this project would be negligible and would be similar across all alternatives.

## 5.6 FLUID MINERALS

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect fluid minerals are development of and exploration for fluid minerals on mineral estate that is not owned by the federal government. This exploration and development must be considered in combination with exploration and development on federal mineral estate to assess the cumulative impacts of this RMPA/EIS. However, as discussed in **Section 1.3**, there is an existing protest resolution decision affecting lands managed within the LFO that does not allow oil and gas leasing of nominated parcels that would require a special stipulation to protect important wildlife values, which includes PPH and PGH, or PH and GH. New leasing of areas with important wildlife values cannot occur until the BLM completes a plan amendment/EIS or a new/revised RMP/EIS, including oil and gas leasing decisions identified in a ROD. Because this RMPA only considers management actions for GRSG and does not address oil and gas leasing options for other wildlife resource values, oil and gas leasing will not be addressed in this RMPA/EIS.

## 5.7 SOLID MINERALS (SOLID LEASABLE MINERALS)

The BLM has not identified any past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that are likely to affect solid leasable minerals (see **Table 5-1**). Therefore, cumulative impacts on solid leasable minerals are not anticipated. Refer to **Section 4.7**, Solid Minerals (Solid Leasable Minerals), for the direct and indirect impacts.

## 5.8 SOLID MINERALS (LOCATABLE MINERALS)

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

## 5.9 SOLID MINERALS (SALABLE MINERALS)

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect salable minerals are the amount of land closed to the disposal of salable minerals compared to the demand for the resource, and the number of restrictions on ROW developments, which slows road construction, the primary use for salable minerals.

As economic conditions improve, salable mineral extraction and use is expected to increase to support nearby development, specifically road building and maintenance. The proximity of both transportation and markets are key elements of a deposit. As the amount of BLM-administered land available for disposition of salable minerals is reduced, demand for salable minerals would increase in other areas. Overall, management under Alternative C would be the

most restrictive, proposing to close 58 percent of the federal mineral estate to the disposition of salable minerals. Management under Alternative D would propose closing 39 percent of the federal mineral estate, and management under Alternative B would propose closing 35 percent. Under Alternative A, less than one percent of the federal mineral estate would remain closed to the disposition of salable minerals, making it the least restrictive to extraction and use of salable minerals.

Restrictions on ROW development (e.g., ROW exclusion and avoidance areas) would likely reduce the demand for salable minerals needed for construction and maintenance. ROW are prohibited in exclusion areas and intended to be avoided in ROW avoidance areas. As such, it is likely that salable mineral demand in these areas would also decrease because fewer roads require less salable minerals. Zero acres would be managed as ROW exclusion area under Alternatives A and D, providing the most opportunity for ROW development and, therefore, greatest demand for salable minerals. Under Alternative C, the BLM would manage 345,560 acres (58 percent, the most of any alternative) as ROW exclusion area, and 233,219 acres (39 percent) under Alternative B.

#### **5.10 COMPREHENSIVE TRAVEL AND TRANSPORTATION MANAGEMENT**

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

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

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

## 5.11 RECREATION

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect recreation are activities that conflict with recreation activities and opportunities, particularly big game hunting. These include mineral development; numerous ROW actions, including eight in 2012; grazing and range improvements, including five different range improvement projects between 2002 and 2012; travel management; and climate change.

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

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

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

Under Alternative A, the BLM would continue to allow ROWs, mineral development, and grazing throughout the planning area with the result of continued cumulative impacts on recreation activities and opportunities. Management under Alternatives B, C, and D would include limitations on surface disturbing activities, such as ROW development, grazing, and mineral development; therefore, reducing the potential for long-term cumulative impacts on recreation. Compared to the other alternatives, management under

Alternative C would result in the least amount of cumulative impacts on recreation due to proposed management prescriptions that include the identification of PH as ROW exclusion area, removal of livestock grazing in GRSG habitat, designation of a new ACEC, and application of COAs on existing fluid mineral leases in PH and GH.

Under all alternatives, the BLM anticipates long-term cumulative impacts from travel management and climate change. Unauthorized motorized cross-country travel and the creation of new roads and trails are and would continue to impact non-motorized recreation opportunities. At the same time, climate change could alter big game habitats, impact water resources for fishing, and increase the threat of wildfire. Increased concern over both areas could result in further management actions to mitigate adverse effects. Additional regulations would result in cumulative impacts (e.g., travel closures or restrictions on SRPs for certain activities), which may reduce recreation opportunities, resulting in further impacts.

## 5.12 RANGE MANAGEMENT

Past, present, and future actions within the cumulative impact analysis area that have affected and would likely continue to affect livestock grazing are mainly those that reduce available grazing acreage, the level of forage production in those areas, or inhibit livestock improvements, such as water development or fences. Generally, livestock use has decreased over the past 100 years. Grazing in portions of the planning area has either remained stable or declined in the recent past, and demand on BLM-administered lands has remained stable between 2002 and 2012. Grazing on private lands within the planning area is generally expected to remain stable or slightly decrease as residential and recreational development increases. These trends are expected to continue.

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

The contribution of the RMPA/EIS to cumulative impacts would parallel the impacts of the alternatives as described in **Chapter 4**. The greatest

contribution to cumulative effects on livestock grazing would be seen in Alternative C due to the reduction of grazing in the planning area. The reduction of grazing on BLM-administrated lands could impact area lessees/permittees economically and may put additional pressure on forage resources on private lands in the area.

Approximately 3,400 additional miles of fencing could be required to exclude livestock from BLM-administered lands where grazing is excluded, representing potential additional costs to private landowners. Lessees and permittees would be faced with reducing AUMs for their operations or locating replacement forage, often at higher costs than that currently obtained from BLM-administered lands, with potential impacts on individual leases/permits as well as the local community. Closures would also impact ability of lessees and permittees current seasonal rotations or other management strategies that utilize both public and private lands.

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

### **5.13 AREAS OF CRITICAL ENVIRONMENTAL CONCERN**

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

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

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

Unauthorized cross-country motorized travel is expected to continue throughout the decision area with cumulative impacts possible within the Acid

Shale-Pine Forest ACEC. The creation of un-authorized trails and primitive roads would result in cumulative impacts on the Acid Shale-Pine Forest ACEC and the GRSG ACEC proposed under Alternative C. Cumulative impacts on the respective ACEC values from unauthorized motorized cross-country travel would include soil compaction and subsequent impacts on the Pine Forest and sage-brush vegetation communities.

Climate change would also pose a long-term threat of cumulative impacts on the relevant and important values of the Acid Shale-Pine Forest ACEC and the GRSG ACEC proposed under Alternative C. Cumulative impacts on GRSG habitat and, consequently, on the ACEC from climate change could include vegetation regime changes (e.g., from sagebrush to grasslands) and increased wildfire potential due to drought (Connelly et al. 2004).

#### 5.14 AIR RESOURCES

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

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

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

Under Alternatives A and D, no new areas would be closed to salable mineral development, and emissions associated with material excavation and processing sites could contribute air pollutants, particularly particulate, to the planning area. Because the level of such activity would be relatively low and emissions would tend to be localized, this activity in conjunction with similar emission-generating projects in the cumulative analysis area would not have a cumulatively significant impact on air quality.

Fires, particularly uncontrolled fires, can significantly affect air quality by introducing large amounts of particulate, CO, atmospheric mercury, ozone precursors, and volatile organic compounds into the air, affecting both visibility and human health. Management actions described in this RMPA/EIS have the potential to reduce human-caused ignition of fires through restriction of activities on BLM-administered lands that introduce equipment and people to the landscape, while activities described in **Table 5-1** have the potential to increase the risk of human-caused fire. As described in **Section 5.1.1**, Wildland Fire Management and Ecology, wildland fires have been frequent in the past decade and are expected to increase in the future due to reoccurring and increasingly severe drought conditions that are caused by climate change. As the global effects of climate change continue into the future, the likelihood of natural, unplanned ignition within the planning area may increase due to the irregular weather patterns, increased likelihood of storms, and drought, resulting in further increases in air pollutant emissions from fire.

## 5.15 CLIMATE

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

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

The management actions proposed in this RMPA/EIS under Alternatives B and C would close areas of BLM-administered lands to ROW developments, which would reduce the demand for salable materials. GHG emissions associated with development on BLM-administered lands would likely be reduced compared with current conditions, and proposed BLM management actions would have no incremental cumulative impact. Under Alternatives A and D, no areas would be closed to salable mineral development, and emissions associated with material excavation and processing sites could contribute GHG emissions to the planning area. Because the level of such activity would be relatively low, this activity in conjunction with similar emission-generating projects in the cumulative analysis area would not have a cumulatively significant impact.

Fires, particularly uncontrolled fires, can emit large quantities of GHGs into the atmosphere, including carbon dioxide, methane, and nitrous oxide (EPA 2012f); fires also remove vegetation that acts as a carbon sink. As described under

**Section 5.1.1, Air Quality**, above, management actions described in this RMPA/EIS have the potential to reduce human-caused ignition of fires through restriction of activities on BLM-administered lands that would introduce equipment and people to the landscape, while activities described in **Table 5-1** have the potential to increase the risk of human-caused fire.

As described in **Section 5.1.1**, wildland fires have been frequent in the past decade and are expected to increase in the future due to reoccurring and increasingly severe drought conditions that are caused by climate change. As the global effects of climate change continue into the future, the likelihood of natural, unplanned ignition within the planning area may increase due to the irregular weather patterns, increased likelihood of storms, and drought, resulting in further increases in GHG emissions from fire.

Overall, federal and nonfederal actions within the planning area would contribute a very small percentage of state and national GHG emissions; CO<sub>2</sub> emissions for all of Montana were only 0.85 percent of total US CO<sub>2</sub> emissions in 2010 (US Energy Information Administration 2013).

## 5.16 SOIL RESOURCES

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect soil resources are drought, wildland fire, and noxious weed invasion, vegetation management, range improvements, unauthorized travel, projects that would increase ROWs and energy and mineral development, and climate change.

Drought and water availability has a significant impact on vegetation in the planning area, which results in a significant impact on soil resources. Drought affects the health of rangeland, riparian areas, and forests, making them more susceptible to the invasion of weeds and fire. Noxious weeds have invaded, and would continue to invade, many locations in the planning area. Noxious weeds are managed through integrated weed management, which includes biological, chemical, mechanical, manual, and educational methods. Drought, along with the 324 wildland fires that have occurred in the planning areas since 2000 and weed invasion, have contributed to current ecological conditions by impacting vegetation communities, which keep soils stabilized and reduce erosion and runoff into waterways.

Fire can impact soils in the short term through the removal of vegetation resulting in instability and increased erosion and sediment runoff. Long-term effects of fire are considered beneficial as the landscape can be returned to a healthier state with proper seeding and management, which would indirectly reduce the risk of fire and provide for more established vegetation communities, resulting in more stable soils. Vegetation management is important for soil stability as vegetation anchors soils in place and prevents excessive erosion and runoff into waterways. Vegetation management includes hazardous

fuels reduction through prescribed fires, chemical and mechanical treatments, and seeding. Between 2002 and 2012 the LFO prescribed vegetation treatments on 17,437 acres, and is proposing crested wheatgrass restoration, clubmoss, and mechanical treatments on approximately 1,000 acres and prescribed fire and maintenance burning on 129,000 acres. These treatments may be implemented within the foreseeable future and could cumulatively benefit soil resources.

Range management involves constructing infrastructure in order to support livestock grazing. Currently, there are 26 miles of stockwater pipelines, 42 watering sites, eight cattleguards, and 58 fences in the planning area. Proposed rangeland improvement projects include an additional 65 miles of fencing, 84 miles of stockwater pipeline, and 87 stockwatering sites which could cumulatively impact soils through compaction during construction and through the rearrangement of cattle movement in the planning area.

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

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

Existing, proposed, and foreseeable ROW development in the planning area (see **Table 5-1**) would also result in cumulative impacts on soil resources through vegetation loss, compaction, and erosion. An average of 13 ROW actions occurs each year in the planning area. So far, eight ROW actions, totaling approximately 34,339 acres of surface disturbance (34,296 of which is temporary surface occupancy; therefore, not all of these acres would be disturbed), have been authorized in 2013 and would affect soil resources. An additional seven land actions are pending and would have the potential to cumulatively impact soils. The development allowed under these authorizations would result in surface-disturbance, which would generally contribute to soil

degradation through compaction, erosion and sediment runoff, and vegetation clearing.

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

Under Alternative A, the BLM would continue to allow ROWs and mineral development throughout the planning area with the result of continued cumulative impacts on soil resources. Management under Alternatives B, C, and D would include limitations on surface disturbing activities, such as ROW development and mineral development; therefore, reducing the potential for long-term cumulative impacts on soil resources on BLM-administered lands. However, the ROW exclusion areas under Alternatives B and C could push ROW development onto private lands which would indirectly contribute to cumulative effects on soils on non-BLM administered lands. An indirect impact from excluding livestock grazing from BLM-administered lands under Alternative C is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This would contribute to the overall loss or degradation of soil resources.

## **5.17 WATER RESOURCES**

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect water resources are drought, wildland fire, and vegetation management, livestock grazing and range improvements, unauthorized travel, projects that would increase ROWs and energy and mineral development, and climate change.

Drought affects the health of rangeland, riparian areas, and forests which make them more susceptible to the invasion of weeds and fire. The BLM has documented 324 drought-associated wildland fires in the planning areas since 2000. Fire can impact water resources in the short term through the removal of vegetation resulting in instability of soils and increased erosion and sediment into waterways. Long-term effects of fire are considered beneficial as the landscape can be returned to a healthier state with proper seeding and management, which would indirectly reduce the risk of fire which would reduce erosion of soils into waterways. Vegetation management is important for soil stability as vegetation anchors soils in place and prevents excessive erosion and runoff into waterways. Vegetation management includes hazardous fuels reduction through prescribed fires, chemical and mechanical treatments, and seeding. Between 2002 and 2012, the LFO prescribed vegetation treatments on 17,437 acres and is proposing crested wheatgrass restoration, clubmoss, and mechanical treatments on approximately 1,000 acres, and prescribed fire and

maintenance burning on 129,000 acres, which may be implemented within the foreseeable future and would cumulatively impact water resources for a short period.

Livestock grazing can affect water resources through the trampling of soils and vegetation along and within natural water features and through the formation of fecal coliforms in waterways. Livestock grazing is associated with range management, which involves constructing infrastructure in order to support livestock grazing. Currently, there are 26 miles of stockwater pipelines, 42 watering sites, eight cattleguards, and 58 fences in the planning area. Proposed rangeland improvement projects include an additional 65 miles of fencing, 84 miles of stockwater pipeline, and 87 stockwatering sites which could cumulatively impact waters through compaction and erosion of soils during construction which could result in runoff into waterways. In addition, the increase in stockwatering sites increases the risk of mosquito breeding habitat being created, which increases the risk of spreading West Nile virus.

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

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

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

Existing, proposed, and foreseeable ROW development in the planning area (see **Table 5-1**) would also result in cumulative impacts on water resources through man-made runoff of soils and chemicals into waterways. An average of 13 ROW actions occurs each year in the planning area. So far eight actions, totaling approximately 34,339 acres of surface disturbance (34,296 of which is temporary surface occupancy; therefore, not all of these acres would be disturbed) have been authorized in 2013, and would affect water resources. An additional seven land actions are pending and would have the potential to cumulatively impact water resources. The development allowed under these authorizations would result in surface-disturbance, which would generally contribute to a decrease in water quality through compaction, erosion, and sediment runoff into waterways as well as an increase in the potential for chemical contamination.

Under Alternative A, the BLM would continue to allow ROWs, mineral development, and grazing throughout the planning area with the result of continued cumulative impacts on water resources. Alternatives B, C, and D would include limitations on surface disturbing activities, such as ROW development, grazing, and mineral development; therefore, reducing the potential for long-term cumulative impacts on water resources on BLM-administered lands. However, the ROW exclusion areas under Alternatives B and C could push ROW development onto private lands which would indirectly contribute to cumulative effects on water resources on non-BLM administered lands. An indirect impact from excluding livestock grazing from BLM-administered lands under Alternative C is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This could contribute to the overall degradation of water resources.

#### **5.18 SPECIAL STATUS SPECIES – OTHER SPECIES OF ISSUE**

Many past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect special status species other than GRSG are described in **Table 5-1**. The future actions most likely to affect special status species are likely associated with energy development, livestock grazing, and lands and realty. Special status species in and adjacent to the planning area, in addition to GRSG, include white-tailed prairie dog, breeding populations of mountain plover, chestnut-collared longspur, northern leopard frog, little Indian breadroot, and Platte cinquefoil, as described in **Section 3.19**, Special Status Species – Other Species of Issue. See **Section 5.1.3** for a discussion of cumulative impacts on GRSG. In general, special status species populations within the LFO are in decline and this trend is attributed to increased habitat fragmentation, spread of noxious weeds, and lack of fire on the landscape and/or fire suppression, and infrastructure development. Other actions that may contribute to cumulative impacts include vegetation management, recreation,

noxious weeds, wildland fires, spread of forest insects and disease, drought, and climate change.

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

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

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

Four indicators were identified to analyze the effects on special status species under each alternative in **Section 4.18**. These indicators include acres of ROW

exclusion area, acres of ROW avoidance area, acres closed to livestock grazing, and available AUMs. Management under Alternative A would generally have the greatest cumulative impacts, because it would provide the fewest considerations of ecological impacts in management decisions. Management under Alternative D would result in slightly fewer cumulative impacts on special status species due to an increase in the number of acres of ROW avoidance area compared to Alternative A. Management under Alternative B would have fewer acres of ROW avoidance areas but would include 233,219 acres of ROW exclusion area compared to Alternative A. Management under Alternative C would have the largest increase in ROW exclusion area and is the only alternative to consider closing a substantial amount of land to livestock grazing (343,991 acres). Additionally, Alternative C would remove 69,408 AUMs on BLM-administered lands and would result in the least cumulative impacts among the proposed alternatives. The impacts on special status species habitat on BLM-administered lands may be reduced from removing ROW development in ROW exclusion areas; however, ROW exclusion areas could result in more widespread development on private lands, and may not reduce overall impacts on special status species habitat. An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for special status species that inhabit land outside of BLM-administered lands.

## 5.19 FISH AND WILDLIFE

As discussed in **Section 3.20**, implementation of any of the alternatives would result in general and unquantifiable indirect beneficial effects for fish in terms of greater protection through new restrictions on surface and resource use resulting in reduced opportunities for surface disturbance or habitat disruption where they exist. Therefore, general fish species will not be discussed further in **Chapter 5**.

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely continue to affect wildlife species are described in **Table 5-1**. The future actions most likely to affect wildlife are likely associated with energy development, livestock grazing, and lands and realty. Key wildlife species described in **Section 3.20**, Fish and Wildlife, include a wide variety of bird species, and big game. Generally, wildlife species in the planning area are common, and their populations are stable. Threats to wildlife species within the planning area include habitat fragmentation, spread of noxious weeds, lack of fire on the landscape, lack of fire suppression, and infrastructure development. Other actions that may contribute to cumulative impacts include vegetation management, recreation, noxious weeds, wildland fires, spread of forest insects and disease, drought, and climate change.

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

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

Recreation and visitor use would likely continue to have increased usage within the planning area. The lands and realty program is expected to receive increased ROW applications for development and infrastructure-related projects. Impacts on wildlife species would still continue to occur outside of the BLM-administered lands as a result of the large expanse and variety of non-BLM-administered lands within PH (974,735 acres) and GH (899,659 acres). There are several land actions that are pending in the planning area which include land exchanges and donations of approximately 1,000 acres that would likely benefit wildlife species habitat. These small gains in potential habitat for wildlife species would likely be eclipsed by surface disturbances associated with future development. The continuing trend of the spread of noxious weeds, occurrence of wildland fires, as well as the spread of forest insects and disease, would likely continue to decrease habitat conditions for wildlife species. Changing climatological conditions between 2002 and 2012 in the western US have produced drought conditions which could be attributed to the increased occurrence of wildland fires and spread of forest insects and disease. Continuation of drought throughout the planning area would decrease the availability of wildlife species habitat.

Four indicators were identified to analyze the effects on wildlife species under each alternative in **Section 4.19**, Fish and Wildlife. These indicators include

acres of ROW exclusion area, acres of ROW avoidance area, acres closed to livestock grazing, and available AUMs. Management under Alternative A would generally have the greatest cumulative impacts, because it provides the fewest considerations of ecological impacts in management decisions. Management under Alternative D would result in slightly fewer cumulative impacts on wildlife species due to an increase in the number of acres of ROW avoidance area compared to Alternative A. Management under Alternative B would have fewer acres of ROW avoidance areas but would include 233,219 acres of ROW exclusion area compared to Alternative A. Management under Alternative C would have the largest increase in ROW exclusion area and is the only alternative to consider closing a substantial amount of land to livestock grazing (343,991 acres). Additionally, management under Alternative C would remove 69,408 AUMs on BLM-administered lands and would result in the least cumulative impacts among the proposed alternatives. The impacts on wildlife habitat on BLM-administered lands may be reduced from removing ROW development in ROW exclusion areas; however, ROW exclusion areas could result in more widespread development on private lands, and may not reduce overall impacts on wildlife habitat. An indirect impact from excluding livestock grazing from BLM-administered lands is the potential conversion of adjacent private grazing lands to agriculture or other land uses, including development within the planning area. This is especially a concern in areas with a mosaic of ownership boundaries, which would decrease available habitat for wildlife species that inhabit land outside of BLM-administered lands.

## 5.20 RENEWABLE ENERGY

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect renewable energy are the construction of existing and proposed roads and transmission lines. They would have a minor cumulative effect by increasing the routing options and possibly reducing project construction or implementation costs.

As stated in **Section 4.20**, there is no “Good” (6.0 kilowatt-hours/square meter/day) or better solar potential within the planning area. As such, none the alternatives would result in cumulative impacts on solar energy development potential.

Across all alternatives the primary indicator of impacts on wind energy is acres of BLM-administered lands with “Good” or better wind potential within ROW exclusion and ROW avoidance areas. The minor cumulative impact of increased routing options and decreased project costs caused by construction of existing and proposed roads and transmission lines could encourage wind energy development on the small percentage of BLM-administered lands that would not be subject to these ROW restrictions. However, under Alternatives B, C, and D, development of wind energy resources on BLM-administered lands are still unlikely due to the fact that 79 percent of “Good” or better wind potential land

within the planning area would be designated as either ROW avoidance or exclusion areas. For wind-power developers, these ROW restrictions would likely negate any positive cumulative impacts caused by the increased routing options and decreased project costs caused by construction of existing and proposed roads and transmission lines.

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

## 5.21 SOCIAL AND ECONOMIC CONDITIONS

Past, present and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and would likely to continue to affect social and economic conditions are those that impact level of employment or income or those that effect quality of life and related non-market values. These activities can include mineral exploration and development, unauthorized travel, livestock grazing, recreation, development in ROWs, weed invasion and spread, prescribed and wildland fires, land planning efforts, vegetation treatments and habitat improvement projects, insects and disease, and drought.

Actions proposed in this RMPA/EIS would contribute to the cumulative impacts on employment and labor income directly as a result of labor required, and indirectly as purchases are made between industry sectors and households spend resulting income. These contributions would accrue in the five-county impact area alongside impacts from other projects occurring on public and private land in the area notably, development of existing BLM-administered surface/federal minerals and development of authorized ROWs and potential development of pending ROW authorizations (see **Table 5-1**).

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

However, as noted above, the five-county impact area can be considered specialized with respect to the grazing sector. Decreases in employment and

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

## **5.22 ENVIRONMENTAL JUSTICE**

Actions in the proposed plan are not anticipated to have a disproportionate impact on those in low income or minority populations under any alternative. As a result, the project would not contribute to cumulative impacts for environmental justice.

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CHAPTER 6  
CONSULTATION AND  
COORDINATION



# CHAPTER 6

## CONSULTATION AND COORDINATION

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

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

### 6.1 PUBLIC INVOLVEMENT

Public involvement is a vital and legal component of both the RMPA and EIS processes. Public involvement vests the public in the decision making process and allows for full environmental disclosure. Guidance for implementing public involvement under NEPA is codified in 40 CFR, Part 1506.6, thereby ensuring that federal agencies make a diligent effort to involve the public in the NEPA process. Section 202 of FLPMA directs the Secretary of the Interior to establish procedures for public involvement during land use planning actions on BLM-administered lands. These procedures can be found in the BLM's *Land Use Planning Handbook* (H-1601-1; BLM 2005a). Public involvement for the

Lewistown Field Office Greater Sage-Grouse RMPA/EIS includes the following four phases:

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

The public scoping phase (phase 1) of the process has been completed and is described in **Section 6.1.1**, Scoping Process. The public outreach and collaboration phases (2 and 3) are ongoing throughout the RMPA/EIS process and are described in **Section 6.2**, Consultation and Coordination, and **Section 6.3**, Cooperating Agencies. Phase 4 started with the 90-day public comment period on the RMPA/EIS.

#### **6.1.1 Scoping Process**

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

#### **Project Website**

The BLM launched a national GRSG conservation website as part of its efforts to maintain and restore GRSG habitat on BLM-administered lands. The national website is available on the internet at <http://www.blm.gov/wo/st/en/prog/more/sagegrouse.html>. The BLM has also launched a Rocky Mountain regional website at <http://www.blm.gov/wo/st/en/prog/more/sagegrouse/eastern.html>. These sites are regularly updated to provide the public with the latest information about the planning process. The Rocky Mountain website provides background information about the project, a public involvement timeline, maps of the planning areas, and copies of public information documents and the notice of intent. The dates and locations of scoping open houses were also announced on the Rocky Mountain website.

### **Press Release**

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

### **Public Scoping Open House**

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

### **Scoping Comments Received**

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

## **6.2 CONSULTATION AND COORDINATION**

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

In addition to formal scoping (**Section 6.1.1**), as summarized below, the BLM has implemented an extensive collaborative outreach and public involvement process that has included coordinating with cooperating agencies. The BLM will continue to meet with interested agencies and organizations throughout the planning process, as appropriate, and will continue coordinating closely with cooperating agencies.

The LFO initiated consultation with tribes that are identified as having interests in the RMPA planning area. Letters were mailed to the tribes listed below in

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

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

Consultation with State Historic Preservation Office (SHPO) will occur along with SHPO's review of the DEIS.

To comply with Section 7(c) of the ESA, the BLM coordinated and consulted the USFWS early in the planning process. The USFWS provided input on planning issues, data collection and review, and alternatives development. The BLM has consulted with the USFWS to develop the draft Biological Assessment, which will be prepared concurrently with this planning process.

### **6.3 COOPERATING AGENCIES**

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

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

**Table 6-1  
Cooperating Agencies**

<b>Agencies and Tribes Invited to be Cooperators</b>	<b>Agencies that Signed MOUs</b>
US Department of the Interior, Fish and Wildlife Service	✓
Montana Department of Fish, Wildlife and Parks	✓
United States Bureau of Indian Affairs	
United States Bureau of Reclamation	
USFWS Charles M. Russell National Wildlife Refuge	
Montana Department of Natural Resources and Conservation	✓
United States Forest Service	✓
Natural Resources Conservation Service	✓
United States Environmental Protection Agency	
Montana State Historic Preservation Office	
Chouteau County Commissioners	
Fergus County Commissioners	✓
Petroleum County Commissioners	✓
Meagher County Commissioners	
Teton County Commissioners	
Pondera County Commissioners	
Judith Basin County Commissioners	✓
Cascade County Commissioners	
Indian Butte Cooperative State Grazing District (CSGD)	✓
Crooked Creek CSGD	
Grass Range CSGD	
Flatwillow CSGD	
Chain Buttes CSGD	✓
Winnett CSGD	✓
Williams Coulee CSGD	
Weede Coulee CSDG	
Petroleum County Conservation District	✓
Blackfeet Tribal Business Council	
Confederated Salish and Kootenai Tribes of the Flathead Reservation	
Chippewa-Cree Indians of the Rocky Boy's Reservation	
Crow Tribe of Montana	
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	
Assiniboine and Sioux Tribes of the Fort Peck Indian ReservationNorthern	
Cheyenne Tribe of the Northern Cheyenne Indian Reservation	
Nez Perce Tribe of Idaho	
Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho	

Starting on June 26, 2012, the BLM has conducted four meetings to date with cooperating agencies. The focus of the meetings was to explain the purpose and need for the RMPA/EIS and the process and to develop a sub-regional management alternative. The entities that were invited to become cooperating agencies were also encouraged to attend the scoping open houses and provide comments during the scoping period (**Section 6.1.1**). These agencies have been engaged throughout the planning process, including during alternatives development.

#### 6.4 LIST OF PREPARERS

This RMPA/EIS was prepared by an interdisciplinary team of staff from the BLM and Environmental Management and Planning Solutions, Inc. As discussed in **Section 6.2**, staff from numerous federal, state, and local agencies, and nonprofit organizations contributed to developing the RMPA. The following is a list of people that prepared or contributed to the development of the RMPA and EIS.

<b>Name</b>	<b>Role/Responsibility</b>
<b>BLM</b>	
<i>Lewistown Field Office</i>	
Dan Brunkhorst	Range, Vegetation, Project Lead
Matt Comer	Wildlife, T&E species
Adam Carr	Project Lead
Karly DeMars	Project Lead
Josh Sorlie	Soils
Hilary Rigby	GIS
Chad Krause	Riparian, Hydrology
Kelly McGill	Recreation, Travel management
Dale Manchester	Fluid Minerals
Chris Rye	Solid Minerals
Debbie Tucek	Lands and Realty
Cathy Barta	Fire and Fuels Management
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Henry Eichman	Socioeconomics and Environmental Justice

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## GLOSSARY



# GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Aquatic.** Living or growing in or on the water.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Closed area.** An area where one or more uses are prohibited either temporarily or over the long term. Areas may be closed to uses such as, but not limited to, off-road vehicles, mineral leasing, mineral or vegetative material collection, or target shooting. In off-road vehicle use closed areas, motorized and mechanized off-road vehicle use is prohibited. Use of motorized and mechanized off-road vehicles in closed areas may be allowed for certain reasons; however, such use shall be made only with the approval of the authorized officer (43 CFR 8340.0-5).

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

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

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

suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects or disease, or other management activities.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Directional drilling.** A drilling technique whereby a well is deliberately deviated from the vertical in order to reach a particular part of the oil- or gas-bearing reservoir. Directional drilling technology enables the driller to steer the drill stem and bit to a desired bottom hole location. Directional wells initially are drilled straight down to a predetermined depth and then

gradually curved at one or more different points to penetrate one or more given target reservoirs. This specialized drilling usually is accomplished with the use of a fluid-driven downhole motor, which turns the drill bit. Directional drilling also allows multiple production and injection wells to be drilled from a single surface location such as a gravel pad, thus minimizing cost and the surface impact of oil and gas drilling, production, and transportation facilities. It can be used to reach a target located beneath an environmentally sensitive area (Alaska Department of Natural Resources, Division of Oil and Gas 2009).

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

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

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

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

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

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

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

**Endangered species.** Any species that is in danger of extinction throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Manual). Under the Endangered

Species Act in the US, “endangered” is the more-protected of the two categories. Designation as endangered (or threatened) is determined by USFWS as directed by the Endangered Species Act.

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

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

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

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

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

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

**Exclusion area.** An area on the public lands where a certain activity(ies) is prohibited to insure protection of other resource values present on the site. The term is frequently used in reference to lands/realty actions and proposals (e.g., rights-of-way, etc.), but is not unique to lands and realty program activities. This restriction is functionally analogous to the phrase "no surface occupancy" used by the oil and gas program, and is applied as an absolute condition to those affected activities. The less restrictive analogous term is avoidance area. Also see “*right-of-way exclusion area*” definition.

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

**Existing routes.** The roads, trails, or ways that are used by motorized vehicles (jeeps, all-terrain vehicles, motorized dirt bikes, etc.), mechanized uses (mountain bikes, wheelbarrows,

game carts), pedestrians (hikers), and/or equestrians (horseback riders) and are, to the best of BLM's knowledge, in existence at the time of RMPA/EIS publication.

**Exploration.** Active drilling and geophysical operations to:

- a. Determine the presence of the mineral resource; or
- b. Determine the extent of the reservoir or mineral deposit.

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

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

**Federal mineral estate.** Subsurface mineral estate owned by the US and administered by the BLM. Federal mineral estate under BLM jurisdiction is composed of mineral estate underlying BLM lands, privately owned lands, and state-owned lands

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Grazing preference.** Grazing preference or preference means the total number of animal unit months on public lands apportioned and attached to base property owned or controlled by a permittee, lessee, or an applicant for a permit or lease. Grazing preference includes active use and use held in suspension. Grazing preference holders have a superior or priority position against others for the purpose of receiving a grazing permit or lease (43 CFR 4100.0-5).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Land use allocation.** The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions (H-1601-I, 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 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and management framework plans (from H-1601-I, 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 1600. When they are presented to the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to Interior Board of Land Appeals.

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

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

**Lease.** Section 302 of the Federal Land Policy and Management Act of 1976 provides the BLM’s authority to issue leases for the use, occupancy, and development of public lands. Leases are issued for purposes such as a commercial filming, advertising displays, commercial or noncommercial croplands, apiaries, livestock holding or feeding areas not related to grazing permits and leases, native or introduced species harvesting, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, ski resorts,

construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and nonirrigation facilities. The regulations establishing procedures for processing these leases and permits are found in 43 CFR 2920.

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

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

**Lek Complex.** A lek or group of leks within 2.5 km (1.5 mi) of each other between which male sage-grouse may interchange from one day to the next. Fidelity to leks has been well documented. Visits to multiple leks are most common among yearlings and less frequent for adult males, suggesting an age-related period of establishment (Connelly et al. 2004).

**Active Lek.** Any lek that has been attended by male sage-grouse during the strutting season.

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

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

**Unoccupied Lek.** A lek that has either been “destroyed” or “abandoned.”

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Mining claim.** A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A

mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, millsite, and tunnel site.

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

**Mitigation.** Includes specific means, measures or practices that could reduce, avoid, or eliminate adverse impacts. Mitigation can include avoiding the impact altogether by not taking a certain action or parts of an action, minimizing the impact by limiting the degree of magnitude of the action and its implementation, rectifying the impact by repairing, rehabilitation, or restoring the affected environment, reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and compensating for the impact by replacing or providing substitute resources or environments.

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

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

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

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

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

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

**National Historic Trail.** A congressionally designated trail that is an extended, long-distance trail, not necessarily managed as continuous, that follows as closely as possible and practicable the original trails or routes of travel of national historic significance. The purpose of a National Historic Trail is the identification and protection of the historic route and the historic remnants and artifacts for public use and enjoyment. A National Historic Trail is managed in a manner to protect the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail (BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation).

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

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

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

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

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

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

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

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

and (5) any combat or combat support vehicle when used for national defense emergencies (43 CFR 8340.0-5).

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

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

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

**Particulate matter (PM).** One of the six “criteria” pollutants for which the US EPA established National Ambient Air Quality Standards. Particulate matter is defined as two categories, fine particulate, with an aerodynamic diameter of 10 micrometers (PM<sub>10</sub>) or less, and fine particulate with an aerodynamic diameter of 2.5 micrometers or less (PM<sub>2.5</sub>).

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

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

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

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

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

**Planning area.** The geographical area for which sage-grouse management plan amendments are developed and maintained. The NDFO Greater Sage-Grouse RMPA/EIS planning area boundary defines the area assessed in this RMPA. 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 NEPA requirements (where applicable) have been met prior to ignition.

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

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

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

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

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

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

**Public Lands Not Designated as Recreation Management Areas.** All lands not designated as an SRMA or ERMA.

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

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

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

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

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

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

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

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

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

**Reference state.** The reference state is the state where the functional capacities represented by soil/site stability, hydrologic function, and biotic integrity are performing at an optimum level

under the natural disturbance regime. This state usually includes, but is not limited to, what is often referred to as the potential natural plant community.

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

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

**Required Design Features (RDF).** Means, measures, or practices intended to reduce or avoid adverse environmental impacts. A suite of features that would establish the minimum specifications for certain activities (i.e., water developments, mineral development, and fire and fuels management) and mitigate adverse impacts. These design features would be required to provide a greater level of regulatory certainty than through implementation of best management practices. In general, the design features are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed except at the project-specific level when the project location and design are known. Because of site-specific circumstances, some features may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations from what is described in the EIS/RMP amendment (e.g., a larger or smaller protective area). All variations in design features would require appropriate analysis and disclosure as part of future project authorizations. Additional mitigation measures may be identified and required during individual project development and environmental review.

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

**Restore/restoration.** Implementation of a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long term. The long-term goal is to create functional, high quality habitat that is occupied by sage-grouse. Short-term goal may be to restore the landform, soils and hydrology and increase the percentage of preferred vegetation, seeding of desired species, or treatment of undesired species.

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

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

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

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

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

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

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

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

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

**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 pursuant to Section 203 of FLPMA, whereby the US receives a fair-market payment for the transfer of land from federal ownership. Public lands determined suitable for sale are offered on the initiative of the BLM. Lands suitable for sale must be identified in the RMP. Any lands to be disposed of by sale that are not identified in the current RMP, or that meet the disposal criteria identified in the RMP, require a plan amendment before a sale can occur.

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

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

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

**Seeding.** Seeding is a vegetation treatment that includes the application of grass, forb, or shrub seed, either aerially or from the ground. In areas of gentle terrain, ground applications of seed are often accomplished with a rangeland drill. Seeding allows the establishment of native species or placeholder species and restoration of disturbed areas to a perennial-dominated cover type,

thereby decreasing the risk of subsequent invasion by exotic plant species. Seeding would be used primarily as a follow-up treatment in areas where disturbance or the previously described treatments have removed exotic plant species and their residue.

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

**Special Recreation Management Area (SRMA).** An administrative public lands unit identified in land use plans where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.

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

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

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

**Stabilize.** The process of stopping further damage from occurring.

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

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

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

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

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

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

- a. Long-term removal occurs when habitat is physically removed through activities that replace suitable habitat with long term occupancy of unsuitable habitat such as a road, powerline, well pad or active mine. Long-term removal may also result from any activities that cause soil mixing, soil removal, and exposure of the soil to erosive processes.
- b. Short-term removal occurs when vegetation is removed in small areas, but restored to suitable habitat within a few years (< 5) of disturbance, such as a successfully reclaimed pipeline, or successfully reclaimed drill hole or pit.
- c. Suitable habitat rendered unusable due to numerous anthropogenic disturbances
- d. Anthropogenic surface disturbance are surface disturbances meeting the above definitions which result from human activities.

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

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

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

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

**Terrestrial.** Living or growing in or on the land.

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

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

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

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

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

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

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

**Transmission.** The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed

for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

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

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

**Trespass.** Any unauthorized use of public land.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Eligible river.** A river or river segment found to meet criteria found in Sections 1(b) and 2(b) of the Wild and Scenic Rivers Act of being free flowing and possessing one or more outstandingly remarkable value.

**Suitable river.** An eligible river segment found through administrative study to meet the criteria for designation as a component of the National System, as specified in Section 4(a) of the Wild and Scenic Rivers Act.

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

**Wilderness.** A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value. The definition is contained in Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).

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

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

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

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

**Wildland fire use.** *A term no longer used; the new terminology is "managed fire" (see "managed fire" definition).* A vegetation treatment that involves taking advantage of a naturally-ignited wildland fire in an area where fire would benefit resources. Wildland fire use would be conducted in specific areas needing treatment after a site-specific plan and NEPA analysis are completed and only if predetermined prescriptive parameters (e.g., weather/fire behavior) can be met. Until this planning and NEPA analysis are accomplished, wildland fires would be suppressed using an appropriate management response.

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

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

**Winter concentration areas.** Sage-grouse winter habitats which are occupied annually by sage-grouse and provide sufficient sagebrush cover and food to support birds throughout the entire winter (especially periods with above average snow cover). Many of these areas support

several different breeding populations of sage-grouse. Sage-grouse typically show high fidelity for these areas, and loss or fragmentation can result in significant population impacts.

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INDEX



# INDEX

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- Air quality, 3-71, 3-72, 3-73, 3-74, 3-75, 3-76, 3-106, 4-129, 5-33, 5-34, 5-35
- Area of Critical Environmental Concern (ACEC), ES-6, 1-9, 2-11, 2-12, 2-14, 2-20, 2-24, 2-28, 2-29, 2-30, 2-44, 2-56, 3-2, 3-25, 3-26, 3-69, 3-70, 3-71, 4-8, 4-17, 4-24, 4-27, 4-28, 4-31, 4-34, 4-47, 4-48, 4-49, 4-50, 4-57, 4-64, 4-66, 4-67, 4-68, 4-69, 4-72, 4-74, 4-77, 4-78, 4-79, 4-82, 4-86, 4-89, 4-92, 4-101, 4-102, 4-103, 4-105, 4-106, 4-107, 4-112, 4-116, 4-118, 4-121, 4-123, 4-124, 4-125, 4-126, 4-127, 4-129, 4-132, 4-137, 4-138, 4-146, 4-148, 4-160, 4-164, 4-167, 4-168, 4-171, 4-174, 4-178, 4-180, 4-181, 4-184, 4-185, 4-191, 4-192, 4-193, 4-194, 5-20, 5-22, 5-25, 5-31, 5-32, 5-33, 6-6, 6-7
- Best Management Practice (BMP), ES-8, ES-12, ES-13, 1-4, 1-15, 2-9, 2-10, 2-11, 2-13, 2-21, 2-36, 2-38, 2-39, 2-39, 2-45, 2-48, 2-52, 2-51, 2-59, 2-60, 2-61, 2-60, 4-6, 4-32, 4-36, 4-39, 4-40, 4-41, 4-43, 4-65, 4-82, 4-88, 4-90, 4-91, 4-111, 4-135, 4-166, 4-167, 4-169, 4-173, 4-179, 4-183, 4-185, 4-196, 4-197
- Bureau of Reclamation (BOR), 3-21, 4-45, 6-5
- Candidate species, 3-5, 4-156
- Cheatgrass, 2-41, 3-12, 3-28, 3-32, 3-33, 3-38, 4-9, 4-10, 4-16, 4-52, 4-54, 4-72, 5-14, 5-18, 5-23, 5-24
- Clean Water Act, 2-33, 3-84, 3-88, 4-163, 4-178
- Coal, 2-11, 2-12, 2-14, 2-23, 2-38, 3-50, 3-51, 3-78, 4-16, 4-22, 4-28, 4-36, 4-41, 4-56, 4-73, 4-74, 4-76, 4-79, 4-84, 4-85, 4-86, 4-102, 4-113, 4-134, 4-137, 4-138, 4-140, 4-141, 4-142, 4-143, 4-144, 4-147, 4-148, 4-150, 4-151, 4-152, 4-154, 4-163, 4-166, 4-173, 4-178, 4-179, 4-183, 5-8, 5-11, 5-16
- Communication site, 3-19, 3-25, 3-105, 4-44, 4-45, 4-46, 5-5, 5-9, 5-12, 5-21
- Council on Environmental Quality (CEQ), ES-8, ES-11, ES-14, 1-15, 2-1, 2-3, 2-8, 2-20, 3-107, 3-108, 4-5, 5-1, 6-1
- County, Chouteau, ES-4, 1-5, 3-44, 3-45, 3-108, 5-5, 5-6, 6-5
- County, Fergus, ES-4, 1-5, 3-38, 3-44, 3-45, 3-51, 3-58, 3-68, 3-108, 5-5, 5-6, 5-21, 6-5
- County, Judith Basin, ES-4, 1-5, 3-51, 3-52, 6-5
- County, Meagher, ES-4, ES-6, 1-4, 1-5, 3-80, 3-108, 6-5
- County, Petroleum, ES-3, ES-4, 1-4, 1-5, 2-65, 3-1, 3-8, 3-14, 3-23, 3-38, 3-44, 3-45, 3-50, 3-51, 3-57, 3-100, 3-101, 3-103, 3-108, 4-19, 4-23, 4-27, 4-189, 5-5, 5-6, 5-11, 5-21, 5-30, 5-36, 5-38, 6-5
- Eagle, bald, 3-93
- Eagle, golden, 3-93, 4-14, 4-156, 5-12
- Emergency stabilization and rehabilitation, 2-42, 2-43, 4-24, 4-42, 4-65, 4-69, 4-125, 4-167, 4-170, 4-173, 4-181, 4-183
- Endangered species, 2-44, 3-20
- Endangered Species Act (ESA), ES-1, ES-2, ES-5, 1-1, 1-2, 1-3, 1-12, 3-5, 3-6, 3-96, 4-156, 4-174, 4-184, 5-31, 6-4
- Environmental justice, ES-7, 1-10, 5-45
- Exclusion area, 2-5, 2-7, 2-10, 2-12, 2-21, 2-22, 2-28, 2-29, 2-45, 2-47, 2-48, 2-49, 2-52, 2-56, 2-58, 2-60, 2-61, 2-63, 2-64, 2-65, 3-25, 4-3,

- 4-14, 4-17, 4-22, 4-23, 4-25, 4-27, 4-29, 4-31, 4-32, 4-34, 4-45, 4-48, 4-49, 4-54, 4-57, 4-61, 4-64, 4-66, 4-68, 4-73, 4-75, 4-77, 4-78, 4-91, 4-93, 4-94, 4-100, 4-104, 4-105, 4-114, 4-117, 4-123, 4-124, 4-127, 4-134, 4-137, 4-138, 4-139, 4-141, 4-144, 4-147, 4-148, 4-149, 4-151, 4-155, 4-158, 4-160, 4-161, 4-162, 4-165, 4-168, 4-175, 4-177, 4-179, 4-180, 4-184, 4-185, 4-186, 4-187, 4-188, 4-190, 4-191, 4-193, 5-12, 5-13, 5-19, 5-20, 5-22, 5-24, 5-25, 5-26, 5-29, 5-31, 5-37, 5-39, 5-41, 5-43, 5-44
- Extensive recreation management area (ERMA), 2-54, 3-56, 3-57, 3-59, 3-60, 4-46, 4-99, 4-100, 4-101, 4-104, 4-105, 4-107
- Federal Land Policy and Management Act (FLPMA), ES-1, ES-6, ES-8, ES-11, ES-14, 1-1, 1-6, 1-8, 1-14, 1-15, 2-3, 2-8, 2-19, 2-29, 3-20, 3-25, 3-61, 3-69, 3-70, 3-105, 4-2, 4-47, 4-90, 4-102, 6-1
- Federal mineral estate, ES-3, ES-4, ES-14, 1-5, 1-6, 2-52, 3-1, 3-49, 3-51, 3-52, 3-53, 3-54, 4-1, 4-80, 4-83, 4-85, 4-88, 4-92, 4-93, 4-94, 5-12, 5-28, 5-29
- Fire management, ES-7, 1-10, 2-5, 2-7, 2-41, 2-42, 2-47, 2-50, 3-37, 3-38, 3-43, 4-38, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-77, 4-78, 4-79, 4-113, 4-164, 4-178, 5-26, 5-27
- Fire regime condition class (FRCC), 3-37, 3-40, 4-70
- Fire, suppression, 2-5, 2-6, 2-7, 2-11, 2-14, 2-42, 2-50, 2-57, 3-38, 4-9, 4-16, 4-20, 4-21, 4-24, 4-27, 4-28, 4-36, 4-37, 4-53, 4-63, 4-65, 4-70, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-77, 4-78, 4-79, 4-110, 4-118, 4-130, 4-132, 4-156, 4-164, 4-167, 4-170, 4-173, 4-178, 4-179, 4-181, 4-183, 4-195, 5-18, 5-19, 5-23, 5-26, 5-27, 5-39, 5-41
- Fire/burning, prescribed, 2-5, 2-7, 2-40, 2-41, 3-37, 4-10, 4-15, 4-21, 4-35, 4-37, 4-53, 4-63, 4-72, 4-74, 4-129, 4-130, 4-132, 4-159, 4-163, 4-164, 4-166, 4-173, 5-4, 5-8, 5-18, 5-19, 5-20, 5-24, 5-25, 5-26, 5-27, 5-31, 5-36, 5-37, 5-40, 5-42
- Fuel load, 3-36, 4-14, 4-21, 4-54, 4-56, 4-63, 4-65, 4-67, 4-70, 4-71, 4-72, 4-73, 4-74, 4-76, 4-77, 4-125, 4-129, 4-132, 4-167, 5-15, 5-20, 5-23, 5-24, 5-25
- Fugitive dust, 3-76, 4-55, 4-56, 4-129, 4-130, 4-197, 5-3, 5-33
- General habitat (GH), ES-2, ES-6, ES-11, ES-12, ES-13, 1-2, 1-4, 1-12, 2-4, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-16, 2-19, 2-22, 2-23, 2-24, 2-27, 2-28, 2-29, 2-30, 2-31, 2-32, 2-33, 2-34, 2-35, 2-36, 2-37, 2-36, 2-37, 2-36, 2-37, 2-38, 2-39, 2-40, 2-41, 2-40, 2-42, 2-43, 2-44, 2-45, 2-46, 2-47, 2-48, 2-49, 2-50, 2-50, 2-51, 2-52, 2-53, 2-54, 2-55, 2-56, 2-57, 2-57, 2-58, 2-59, 2-60, 2-60, 2-61, 2-62, 2-63, 2-64, 3-6, 3-46, 3-49, 3-86, 3-93, 4-7, 4-11, 4-17, 4-18, 4-21, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27, 4-29, 4-31, 4-32, 4-33, 4-34, 4-35, 4-37, 4-39, 4-39, 4-40, 4-42, 4-42, 4-48, 4-49, 4-50, 4-54, 4-57, 4-58, 4-61, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, 4-77, 4-78, 4-79, 4-83, 4-89, 4-90, 4-91, 4-94, 4-96, 4-98, 4-103, 4-104, 4-105, 4-106, 4-107, 4-111, 4-114, 4-119, 4-120, 4-121, 4-130, 4-133, 4-139, 4-141, 4-142, 4-143, 4-149, 4-151, 4-152, 4-153, 4-154, 4-157, 4-161, 4-162, 4-165, 4-166, 4-167, 4-168, 4-169, 4-171, 4-175, 4-178, 4-179, 4-180, 4-181, 4-182, 4-190, 4-192, 4-193, 4-194, 5-8, 5-11, 5-12, 5-15, 5-16, 5-17, 5-18, 5-19, 5-20, 5-22, 5-24, 5-25, 5-26, 5-28, 5-31, 5-42
- General habitat, preliminary (PGH), ES-2, ES-3, ES-4, ES-5, ES-7, ES-12, 1-2, 1-4, 1-5, 1-6, 1-10, 1-12, 1-13, 2-9, 2-39, 2-45, 3-4, 3-7, 3-8, 3-10, 3-12, 3-13, 3-14, 3-15, 3-17, 3-18, 3-21, 3-22, 3-23, 3-24, 3-25, 3-26, 3-29, 3-33, 3-34, 3-35, 3-38, 3-39, 3-40, 3-41, 3-42, 3-43, 3-44, 3-45, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-52, 3-53, 3-54, 3-55, 3-56, 3-57, 3-58, 3-59, 3-63, 3-64, 3-65, 3-67, 3-68, 3-69, 3-81, 3-82, 3-83, 3-84, 3-85, 3-86, 3-87, 3-90, 3-92, 3-93, 3-94, 3-99, 3-105, 4-7, 4-16, 4-17, 4-18, 4-19, 4-20, 4-31, 4-39, 4-40, 4-47, 4-50, 4-103, 4-114, 4-157, 4-165, 5-11, 5-28
- Geothermal, 1-19, 3-26, 3-27, 3-43, 3-96, 5-8
- Grazing, allotment, 1-7, 2-10, 2-13, 2-14, 2-30, 2-31, 2-32, 2-34, 2-35, 2-36, 2-42, 2-43, 2-44, 2-47, 3-37, 3-43, 3-61, 3-62, 3-63, 3-64, 3-65, 3-66, 3-105, 4-35, 4-109, 4-110, 4-112, 4-114, 4-116, 4-117, 4-121, 4-148, 4-155, 4-165, 4-172, 4-175, 4-182, 4-191
- Grazing, management, 1-20, 2-10, 2-14, 2-19, 2-30, 2-31, 2-32, 2-34, 2-35, 2-41, 2-42, 2-43, 2-44, 2-49, 2-60, 2-62, 2-63, 3-61, 3-62, 3-66, 3-67, 3-68, 3-69, 4-12, 4-13, 4-18, 4-20, 4-56, 4-62, 4-65, 4-72, 4-77, 4-109, 4-111, 4-113,

- 4-114, 4-115, 4-134, 4-136, 4-138, 4-165,  
4-166, 5-14, 5-17, 5-19, 5-20, 5-24, 5-25, 5-31
- Land tenure adjustments, 2-29, 2-30, 3-19, 3-20,  
3-28, 3-105, 4-6, 4-15, 4-33, 4-44, 4-46, 4-48,  
4-50, 4-57, 4-161, 5-21, 5-22
- Leasing, oil and gas, ES-3, ES-5, 1-4, 1-12, 3-46,  
3-49, 4-11, 4-12, 4-54, 5-4, 5-11, 5-28, 5-36,  
5-38, 5-40, 5-42
- Lek, 1-20, 2-12, 2-27, 2-28, 2-35, 2-36, 2-37,  
2-47, 2-48, 2-53, 3-7, 3-8, 3-12, 3-13, 3-15,  
3-16, 3-17, 3-18, 3-26, 4-6, 4-7, 4-8, 4-10,  
4-11, 4-14, 4-19, 4-20, 4-23, 4-27, 4-30, 4-35,  
4-46, 4-48, 4-66, 4-97, 4-98, 4-105, 4-127,  
4-141, 4-151, 4-167, 4-180, 5-8, 5-12, 5-29
- Listed species, see Threatened and endangered  
species
- Minerals, entry, 2-23, 2-24, 2-38, 2-59, 2-60,  
3-52, 4-22, 4-39, 4-63, 4-65, 4-87, 4-118,  
4-124, 4-127, 4-138, 4-140, 4-142, 4-144,  
4-148, 4-150, 4-152, 4-154, 4-160, 4-166,  
5-11
- Minerals, fluid, 1-12, 2-1, 2-5, 2-7, 2-8, 2-23,  
2-36, 2-39, 2-44, 2-50, 2-51, 2-54, 2-56, 2-59,  
2-60, 2-62, 2-64, 3-2, 3-14, 3-43, 3-44, 3-49,  
3-71, 4-3, 4-11, 4-16, 4-21, 4-25, 4-28, 4-31,  
4-36, 4-63, 4-65, 4-67, 4-69, 4-74, 4-76, 4-77,  
4-79, 4-80, 4-81, 4-82, 4-83, 4-84, 4-86, 4-89,  
4-92, 4-100, 4-103, 4-104, 4-106, 4-107,  
4-113, 4-115, 4-118, 4-120, 4-122, 4-124,  
4-125, 4-127, 4-129, 4-132, 4-135, 4-136,  
4-138, 4-140, 4-141, 4-142, 4-143, 4-145,  
4-148, 4-150, 4-152, 4-154, 4-163, 4-166,  
4-169, 4-173, 4-178, 4-179, 4-181, 4-183,  
4-185, 5-8, 5-12, 5-16, 5-19, 5-20, 5-24, 5-28,  
5-30, 5-31, 5-36, 5-38, 6-6
- Minerals, leasable, 2-11, 2-12, 2-14, 2-23, 2-24,  
2-39, 3-26, 3-43, 3-50, 3-96, 4-16, 4-29, 4-65,  
4-84, 4-85, 4-115, 4-118, 4-163, 4-166, 4-173,  
4-179, 5-28
- Minerals, locatable, 2-11, 2-12, 2-14, 2-23, 2-24,  
2-38, 2-52, 3-2, 3-14, 3-50, 3-51, 3-52, 4-17,  
4-22, 4-29, 4-39, 4-63, 4-65, 4-69, 4-74, 4-76,  
4-79, 4-87, 4-88, 4-89, 4-90, 4-102, 4-115,  
4-124, 4-148, 4-154, 4-163, 4-166, 4-173,  
4-183, 5-11, 5-28
- Minerals, material, 3-52
- Minerals, saleable, 2-24, 2-52
- Minerals, solid leasable, 2-23, 2-51, 3-2, 3-14,  
3-50, 4-84, 4-85, 4-86, 4-87, 5-28
- Mining operations, 2-38, 4-74, 4-111
- Mountain biking, 4-15, 4-136, 4-146
- National Ambient Air Quality Standards, 3-71,  
3-72, 3-73, 3-76
- National Environmental Policy Act of 1969  
(NEPA), ES-6, ES-8, ES-10, ES-14, 1-7, 1-8,  
1-10, 1-13, 1-15, 1-20, 2-2, 2-3, 2-8, 2-11,  
2-12, 2-14, 2-15, 2-18, 2-19, 2-20, 2-31, 2-36,  
2-37, 2-36, 2-38, 2-36, 2-37, 2-41, 3-61, 3-68,  
3-107, 4-3, 4-5, 4-29, 4-47, 4-165, 4-170,  
4-172, 4-195, 4-196, 4-197, 6-1, 6-2, 6-3
- Off-highway vehicle (OHV), ES-14, 1-13, 1-20,  
2-5, 2-6, 2-7, 2-44, 2-53, 3-14, 3-54, 3-56,  
3-57, 3-60, 3-106, 4-1, 4-2, 4-15, 4-32, 4-55,  
4-96, 4-98, 4-101, 4-102, 4-103, 4-105, 4-110,  
4-136, 4-146, 4-177, 5-29
- Ozone (O<sub>3</sub>), 3-71, 3-72, 3-73, 4-129, 5-34
- Planning issue, ES-6, ES-10, ES-11, 1-7, 1-8, 1-9,  
2-1, 2-2, 2-3, 2-4, 2-20, 2-21, 2-25, 4-4, 6-3,  
6-4
- Plants, invasive, see Vegetation, invasive/noxious  
weeds
- Particulate matter (PM<sub>2.5</sub>), 3-71, 3-72, 3-73,  
3-75, 4-129, 4-130, 5-33, 5-34
- Priority habitat (PH), ES-2, ES-6, ES-11, ES-12,  
ES-13, 1-2, 1-4, 1-12, 2-4, 2-9, 2-10, 2-11,  
2-12, 2-13, 2-14, 2-16, 2-19, 2-22, 2-23, 2-24,  
2-27, 2-28, 2-29, 2-30, 2-29, 2-30, 2-31, 2-32,  
2-33, 2-34, 2-35, 2-36, 2-37, 2-36, 2-37, 2-36,  
2-37, 2-38, 2-39, 2-40, 2-41, 2-40, 2-41, 2-40,  
2-41, 2-41, 2-42, 2-43, 2-44, 2-45, 2-46, 2-47,  
2-48, 2-49, 2-50, 2-50, 2-51, 2-52, 2-53, 2-54,  
2-54, 2-55, 2-56, 2-57, 2-57, 2-58, 2-59, 2-60,  
2-61, 2-62, 2-63, 2-64, 3-7, 3-46, 3-49, 3-86,  
4-7, 4-11, 4-17, 4-18, 4-19, 4-20, 4-21, 4-22,  
4-23, 4-24, 4-25, 4-26, 4-27, 4-28, 4-29, 4-30,  
4-31, 4-32, 4-33, 4-34, 4-35, 4-37, 4-38, 4-38,  
4-39, 4-39, 4-40, 4-41, 4-42, 4-42, 4-46, 4-48,  
4-49, 4-50, 4-54, 4-55, 4-57, 4-58, 4-61, 4-63,  
4-64, 4-65, 4-66, 4-67, 4-68, 4-69, 4-75, 4-76,  
4-77, 4-78, 4-79, 4-83, 4-86, 4-87, 4-89, 4-90,  
4-91, 4-93, 4-94, 4-96, 4-97, 4-98, 4-99,  
4-103, 4-104, 4-105, 4-106, 4-111, 4-114,  
4-116, 4-117, 4-118, 4-119, 4-120, 4-121,  
4-122, 4-126, 4-130, 4-132, 4-133, 4-139,  
4-140, 4-141, 4-142, 4-143, 4-149, 4-150,  
4-151, 4-152, 4-153, 4-154, 4-157, 4-161,  
4-162, 4-164, 4-165, 4-166, 4-167, 4-168,  
4-169, 4-171, 4-172, 4-173, 4-175, 4-178,  
4-179, 4-180, 4-181, 4-182, 4-183, 4-190,  
4-191, 4-192, 4-193, 4-194, 5-8, 5-11, 5-12,

- 5-13, 5-15, 5-16, 5-17, 5-18, 5-19, 5-20, 5-22, 5-24, 5-25, 5-26, 5-28, 5-29, 5-31, 5-32, 5-42
- Priority habitat, preliminary (PPH), ES-2, ES-3, ES-4, ES-5, ES-7, ES-12, 1-2, 1-4, 1-5, 1-6, 1-10, 1-12, 1-13, 2-9, 2-39, 2-45, 3-4, 3-7, 3-8, 3-9, 3-12, 3-13, 3-14, 3-15, 3-16, 3-17, 3-18, 3-21, 3-22, 3-23, 3-24, 3-25, 3-26, 3-29, 3-33, 3-34, 3-35, 3-38, 3-39, 3-40, 3-41, 3-42, 3-43, 3-44, 3-45, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-52, 3-53, 3-54, 3-55, 3-56, 3-57, 3-58, 3-59, 3-63, 3-64, 3-65, 3-67, 3-68, 3-69, 3-70, 3-71, 3-81, 3-82, 3-83, 3-84, 3-85, 3-86, 3-87, 3-90, 3-92, 3-93, 3-94, 3-96, 3-99, 3-105, 4-16, 4-17, 4-18, 4-19, 4-20, 4-31, 4-38, 4-39, 4-40, 4-47, 4-114, 4-157, 5-11, 5-28
- Proper functioning condition, 2-31, 2-33, 2-32, 2-33, 2-49, 2-60, 3-31, 3-35, 3-37, 3-88, 4-50, 4-53, 4-62, 4-109, 4-115, 4-117, 4-145, 4-147, 4-148, 4-150, 4-153, 4-163, 4-178
- Public access, 2-27, 3-59, 4-96, 4-98, 4-171
- Rangeland health, 2-35, 2-47, 2-49, 2-55, 3-35, 3-66, 4-10, 4-13, 4-18, 4-20, 4-35, 4-62, 4-67, 4-108, 4-111, 4-112, 4-114, 4-117, 5-19
- Raptor, 2-47, 3-13, 3-64, 3-93, 3-95, 3-96, 4-10, 4-14, 4-26, 4-35, 4-52, 4-157, 4-176, 5-15, 5-17
- Record of Decision (ROD), ES-3, ES-6, ES-12, 1-4, 1-13, 1-17, 1-19, 1-20, 2-3, 2-9, 2-21, 2-23, 2-27, 2-44, 3-46, 3-49, 3-56, 3-60, 4-32, 4-97, 4-98, 4-106, 5-11, 5-28, 5-29
- Renewable energy, ES-7, 1-10, 1-12, 3-14, 3-26, 3-27, 3-96, 3-97, 3-98, 3-99, 4-44, 4-45, 4-71, 4-101, 4-103, 4-124, 4-135, 4-184, 4-185, 5-21, 5-22, 5-43
- Rights-of-way (ROW), ES-13, 2-5, 2-7, 2-10, 2-12, 2-13, 2-21, 2-22, 2-23, 2-28, 2-29, 2-37, 2-38, 2-44, 2-45, 2-46, 2-47, 2-48, 2-49, 2-50, 2-52, 2-54, 2-56, 2-56, 2-58, 2-59, 2-61, 2-63, 2-64, 2-65, 3-13, 3-14, 3-19, 3-23, 3-24, 3-25, 3-26, 3-27, 3-54, 3-59, 3-71, 3-91, 3-97, 3-98, 3-105, 4-3, 4-14, 4-16, 4-17, 4-22, 4-23, 4-25, 4-27, 4-29, 4-30, 4-31, 4-32, 4-34, 4-41, 4-44, 4-45, 4-46, 4-47, 4-48, 4-49, 4-54, 4-57, 4-58, 4-61, 4-64, 4-66, 4-68, 4-73, 4-75, 4-77, 4-78, 4-91, 4-92, 4-93, 4-94, 4-95, 4-96, 4-100, 4-101, 4-102, 4-103, 4-104, 4-105, 4-106, 4-107, 4-111, 4-113, 4-114, 4-117, 4-119, 4-121, 4-123, 4-124, 4-126, 4-134, 4-135, 4-136, 4-137, 4-138, 4-139, 4-141, 4-143, 4-144, 4-146, 4-147, 4-148, 4-149, 4-151, 4-153, 4-155, 4-158, 4-160, 4-161, 4-162, 4-163, 4-165, 4-168, 4-171, 4-175, 4-177, 4-178, 4-179, 4-180, 4-184, 4-185, 4-186, 4-187, 4-188, 4-189, 4-190, 4-191, 4-193, 4-194, 4-196, 4-197, 5-5, 5-6, 5-9, 5-12, 5-13, 5-19, 5-20, 5-21, 5-22, 5-24, 5-25, 5-26, 5-27, 5-28, 5-29, 5-30, 5-32, 5-33, 5-34, 5-35, 5-36, 5-37, 5-39, 5-40, 5-42, 5-43, 5-44
- Sensitive species, 1-12, 2-33, 2-43, 2-44, 3-5, 4-28, 4-29, 4-69, 4-156, 4-172, 4-194
- Socioeconomics, ES-7, ES-8, ES-9, ES-10, 1-10, 1-11, 1-15, 1-16, 3-100, 4-112, 5-44, 6-7
- Soils, erodible, 4-62, 4-124
- Soils, fragile, 3-71, 4-136
- Special recreation management area (SRMA), 2-54, 3-57, 3-58, 3-59, 4-46, 4-99, 4-100, 4-101, 4-104, 4-105
- Split estate, 4-2, 4-3, 4-46, 4-72, 4-86, 4-89, 4-92, 4-101, 4-111, 4-120, 4-125, 4-129, 4-132, 4-139, 4-140, 4-141, 4-142, 4-144, 4-148, 4-150, 4-151, 4-152, 4-154, 4-185
- Stipulation, Controlled surface use (CSU), 4-100
- Stipulation, No surface occupancy (NSO), 2-36, 3-24, 4-100, 4-135, 4-158
- Stipulation, Timing limitation (TL), 2-54, 4-45, 4-82, 4-83, 4-84, 4-104
- Threatened and endangered species, ES-1, ES-2, 1-1, 1-2, 2-44, 2-65, 3-5, 4-6, 4-15, 4-20, 4-24, 4-156, 4-173, 4-183, 4-194
- Timber harvest, 2-44, 3-71
- Travel management, ES-7, ES-8, 1-10, 1-11, 1-20, 2-5, 2-6, 2-7, 2-10, 2-13, 2-22, 2-27, 2-28, 2-41, 2-42, 2-44, 2-53, 3-2, 3-54, 4-19, 4-23, 4-30, 4-32, 4-46, 4-71, 4-73, 4-77, 4-85, 4-88, 4-92, 4-95, 4-96, 4-97, 4-98, 4-99, 4-101, 4-106, 4-110, 4-112, 4-119, 4-121, 4-139, 4-149, 4-164, 4-171, 4-178, 5-29, 5-30, 5-31, 5-32, 6-6, 6-7
- Travel, dispersed, 4-112
- Travel, mechanized, ES-7, 1-10, 2-22, 4-46, 4-73, 4-112
- Travel, motorized, 2-10, 2-12, 2-13, 2-27, 2-44, 2-53, 3-14, 3-71, 4-49, 4-73, 4-77, 4-95, 4-96, 4-101, 4-103, 4-106, 4-124, 4-125, 4-139, 4-149, 4-156, 4-157, 4-175, 4-176, 5-29, 5-32
- United States Forest Service, ES-3, 1-4, 1-6, 1-14, 1-17, 1-18, 3-1, 3-21, 3-22, 3-23, 3-33, 3-34, 3-39, 3-40, 3-45, 3-46, 3-47, 3-53, 3-55,

- 3-63, 3-64, 3-83, 3-93, 3-100, 3-103, 3-104,  
3-105, 3-106, 3-108, 5-4, 6-5, 6-7
- Utility corridor, 3-21, 4-44, 4-100
- Vegetation, invasive /noxious weeds, ES-7,  
ES-10, 1-10, 1-16, 2-29, 2-34, 2-41, 2-47,  
2-49, 2-62, 2-64, 3-12, 3-31, 3-36, 3-37, 3-38,  
3-61, 3-67, 3-69, 4-7, 4-8, 4-9, 4-10, 4-14,  
4-15, 4-16, 4-20, 4-22, 4-23, 4-25, 4-26, 4-29,  
4-35, 4-36, 4-50, 4-51, 4-52, 4-53, 4-54, 4-55,  
4-56, 4-62, 4-65, 4-66, 4-67, 4-69, 4-71, 4-72,  
4-111, 4-113, 4-114, 4-115, 4-117, 4-121,  
4-155, 4-157, 4-159, 4-161, 4-168, 4-175, 5-6,  
5-8, 5-9, 5-12, 5-13, 5-14, 5-15, 5-17, 5-18,  
5-23, 5-24, 5-25, 5-35, 5-39, 5-40, 5-41, 5-42
- Vegetation, Riparian, 2-31, 2-32, 2-33, 2-32,  
2-33, 2-34, 2-42, 2-49, 2-60, 2-62, 2-64, 3-2,  
3-8, 3-9, 3-10, 3-11, 3-12, 3-28, 3-29, 3-30,  
3-31, 3-34, 3-35, 3-37, 3-62, 3-84, 3-87, 3-88,  
3-89, 3-90, 4-6, 4-13, 4-15, 4-16, 4-18, 4-20,  
4-22, 4-24, 4-37, 4-50, 4-53, 4-55, 4-56, 4-59,  
4-60, 4-62, 4-63, 4-65, 4-109, 4-112, 4-115,  
4-117, 4-121, 4-145, 4-148, 4-150, 4-152,  
4-153, 4-159, 4-163, 4-164, 4-165, 4-169,  
4-172, 4-178, 4-182, 5-7, 5-14, 5-23, 5-24,  
5-35, 5-37, 5-40, 5-42, 6-6
- Vegetation, wetlands, 2-31, 2-33, 2-32, 2-33,  
2-34, 2-34, 2-60, 3-2, 3-9, 3-11, 3-12, 3-28,  
3-29, 3-30, 3-31, 3-34, 3-35, 3-37, 3-84, 3-87,  
3-88, 4-6, 4-22, 4-50, 4-55, 4-61, 4-115,  
4-148, 4-153, 4-159, 4-169, 4-172, 4-182,  
5-23
- Water quality, 2-31, 2-33, 3-30, 3-31, 3-84,  
3-85, 3-87, 3-88, 3-91, 3-106, 4-50, 4-109,  
4-145, 4-146, 4-147, 4-148, 4-149, 4-150,  
4-151, 4-152, 4-153, 4-157, 4-174, 4-175,  
4-176, 5-39
- Water, groundwater, 3-30, 3-85, 3-87, 3-88,  
3-90, 4-145, 4-146
- Water, surface water, 3-80, 3-84, 3-85, 3-87,  
4-82, 4-136, 4-145, 4-146, 4-147, 4-151,  
4-154
- Watershed, 2-4, 2-13, 2-20, 2-30, 2-31, 2-32,  
2-33, 2-34, 2-35, 2-46, 3-5, 3-6, 3-14, 3-15,  
3-17, 3-18, 3-66, 3-67, 3-68, 3-69, 3-84, 3-85,  
3-86, 4-7, 4-9, 4-19, 4-27, 4-30, 4-31, 4-33,  
4-34, 4-35, 4-36, 4-109, 4-138, 4-145, 4-163,  
4-178, 5-7, 5-11, 5-12, 5-13, 5-16, 5-21, 5-26
- West Nile virus, 2-20, 2-33, 2-34, 2-35, 2-37,  
3-84, 4-13, 4-19, 4-20, 4-36, 4-145, 4-146,  
4-148, 4-150, 4-151, 4-152, 4-153, 4-154,  
4-169, 5-38
- Wilderness Characteristics, 1-14
- Wilderness study area (WSA), 1-13, 1-14, 2-28,  
4-8, 4-161
- Wildland fire, ES-7, 1-10, 2-5, 2-7, 2-40, 2-41,  
2-50, 3-36, 3-37, 3-38, 3-39, 3-43, 4-51, 4-53,  
4-70, 4-71, 4-72, 4-74, 4-76, 4-110, 4-113,  
4-128, 4-131, 4-160, 4-173, 4-180, 4-195, 5-6,  
5-10, 5-16, 5-23, 5-26, 5-27, 5-31, 5-34, 5-35,  
5-37, 5-40, 5-41, 5-42, 5-44
- Withdrawal, 2-10, 2-11, 2-12, 2-13, 2-23, 2-24,  
2-30, 2-39, 2-38, 2-39, 2-38, 2-51, 3-19, 3-20,  
3-26, 4-22, 4-40, 4-39, 4-44, 4-45, 4-47, 4-49,  
4-57, 4-63, 4-65, 4-76, 4-78, 4-87, 4-88, 4-89,  
4-90, 4-91, 4-114, 4-118, 4-148, 4-154, 4-160,  
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## APPENDICES



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# Appendix A

## Figures



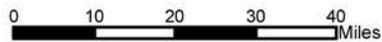
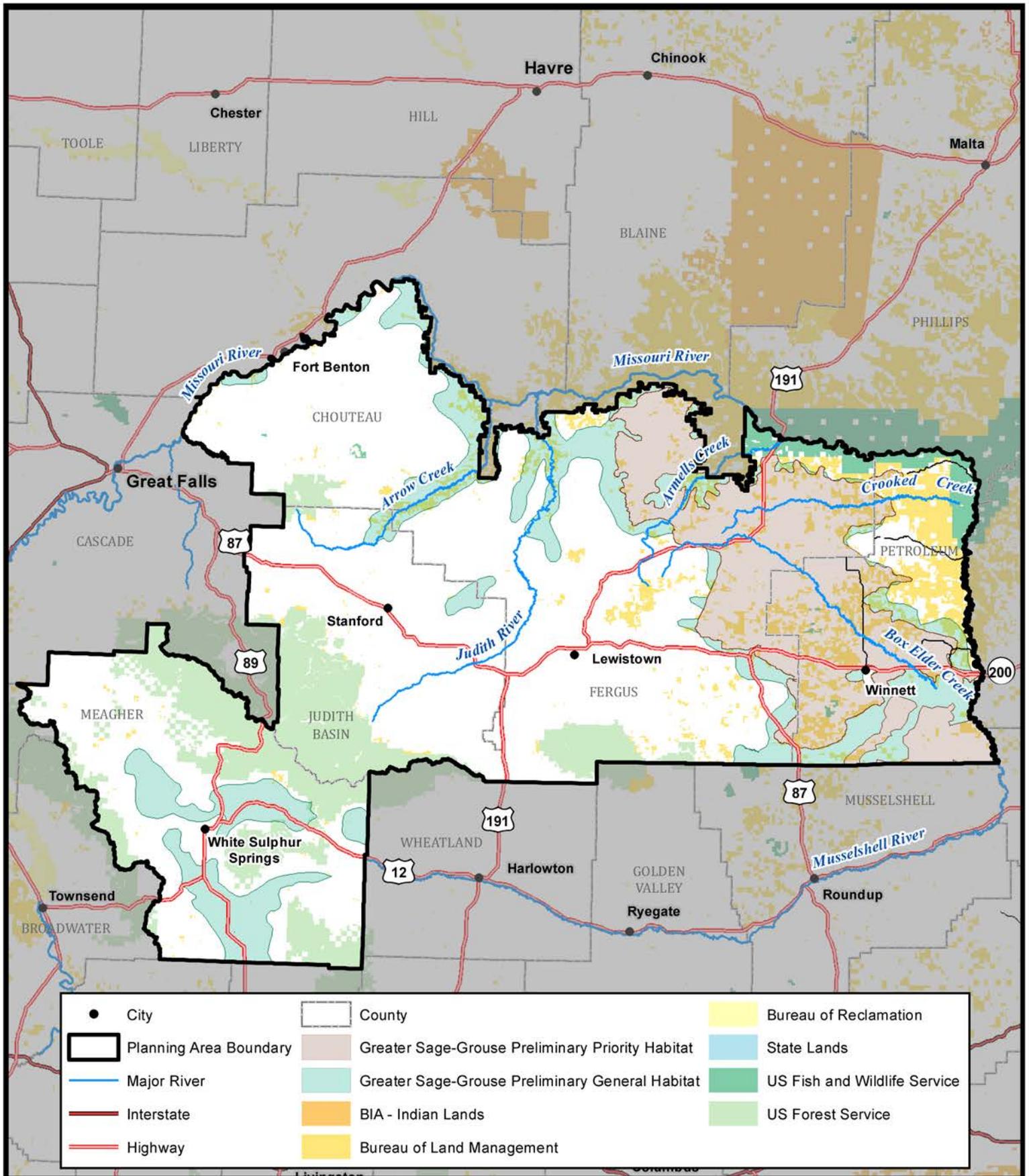
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## FIGURES

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- 1-1 Project Planning Area
- 2-1 Rights-of-Way Avoidance Areas – Alternative A
- 2-2 Rights-of-Way Avoidance and Exclusion Areas – Alternative B
- 2-3 Rights-of-Way Exclusion Areas – Alternative C
- 2-4 Rights-Of-Way Avoidance Areas – Alternative D
- 2-5 Rights-Of-Way Wind Energy Avoidance Areas – Alternative D
- 2-6 Grazing Allotments Alternative A
- 2-7 Areas Open and Closed Grazing Allotments Alternative B and D
- 2-8 Areas Open and Closed Grazing Allotments Alternative C
- 2-9 Solid Leasable and Salable Minerals – Alternative A
- 2-10 Solid Leasable and Salable Minerals – Alternative B
- 2-11 Solid Leasable and Salable Minerals – Alternative C
- 2-12 Solid Leasable and Salable Minerals – Alternative D
- 2-13 Withdrawals and Recommend for Withdrawal – Alternative A
- 2-14 Withdrawals and Recommend for Withdrawal – Alternative B
- 2-15 Withdrawals and Recommend for Withdrawal – Alternative C
- 2-16 Withdrawals and Recommend for Withdrawal – Alternative D
- 2-17 Area of Critical Environmental Concern – Alternative C
- 3-1 Greater Sage-Grouse Habitat
- 3-2 Greater Sage-Grouse Breeding Density
- 3-3 Wetland and Riparian Areas
- 3-4 Fire Regime Condition Class
- 3-5 Fluid Minerals – Existing Leases
- 3-6 Recreation Management Areas
- 3-7 Resource Activity Plans – Grazing Authorization Renewal Areas
- 3-8 Areas of Critical Environmental Concern
- 3-9 Major Soil Orders
- 3-10 NRCS Farmland Classification
- 3-11 Soil Restoration Potential
- 3-12 Water Features

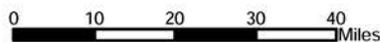
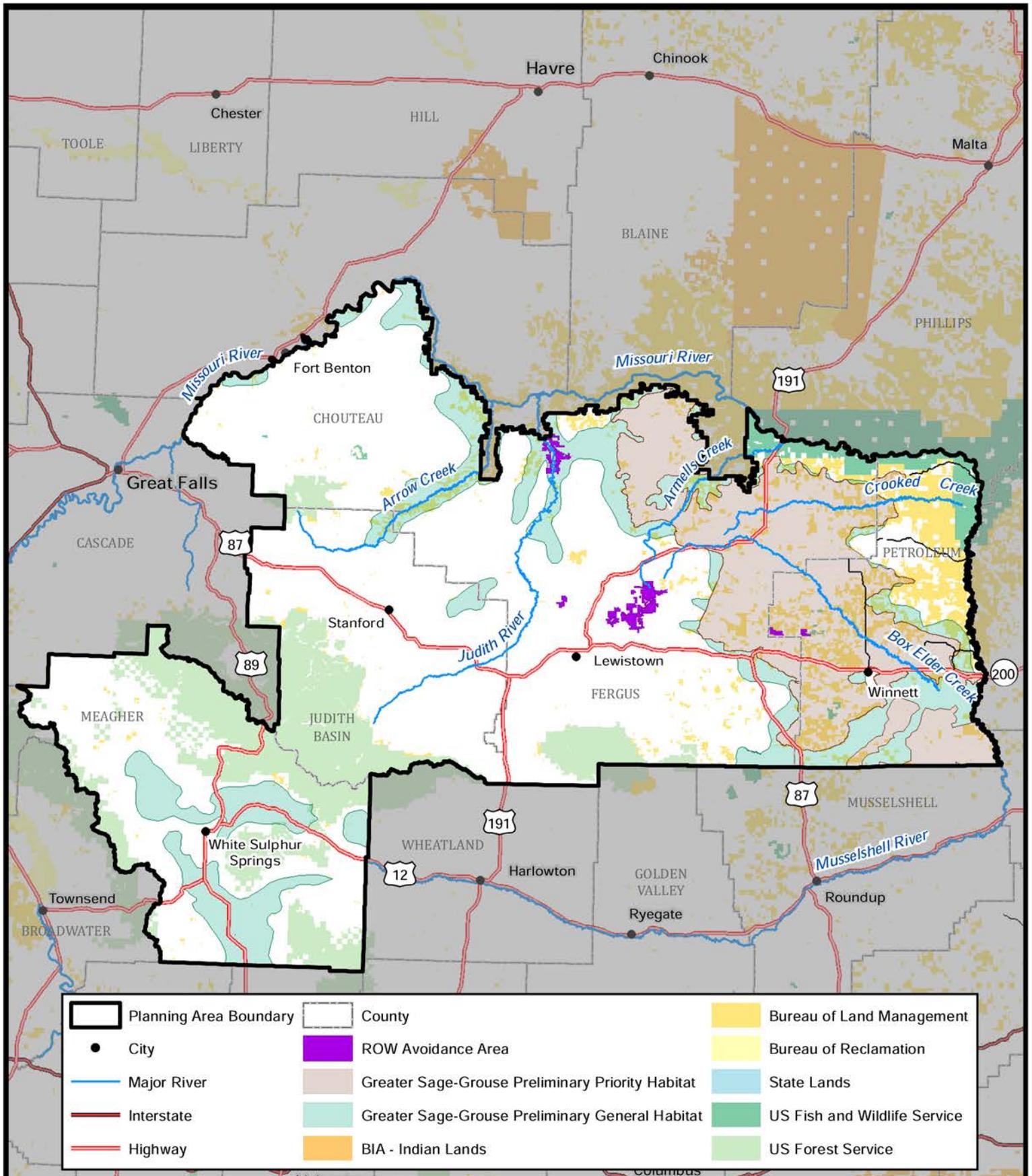
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# Project Planning Area

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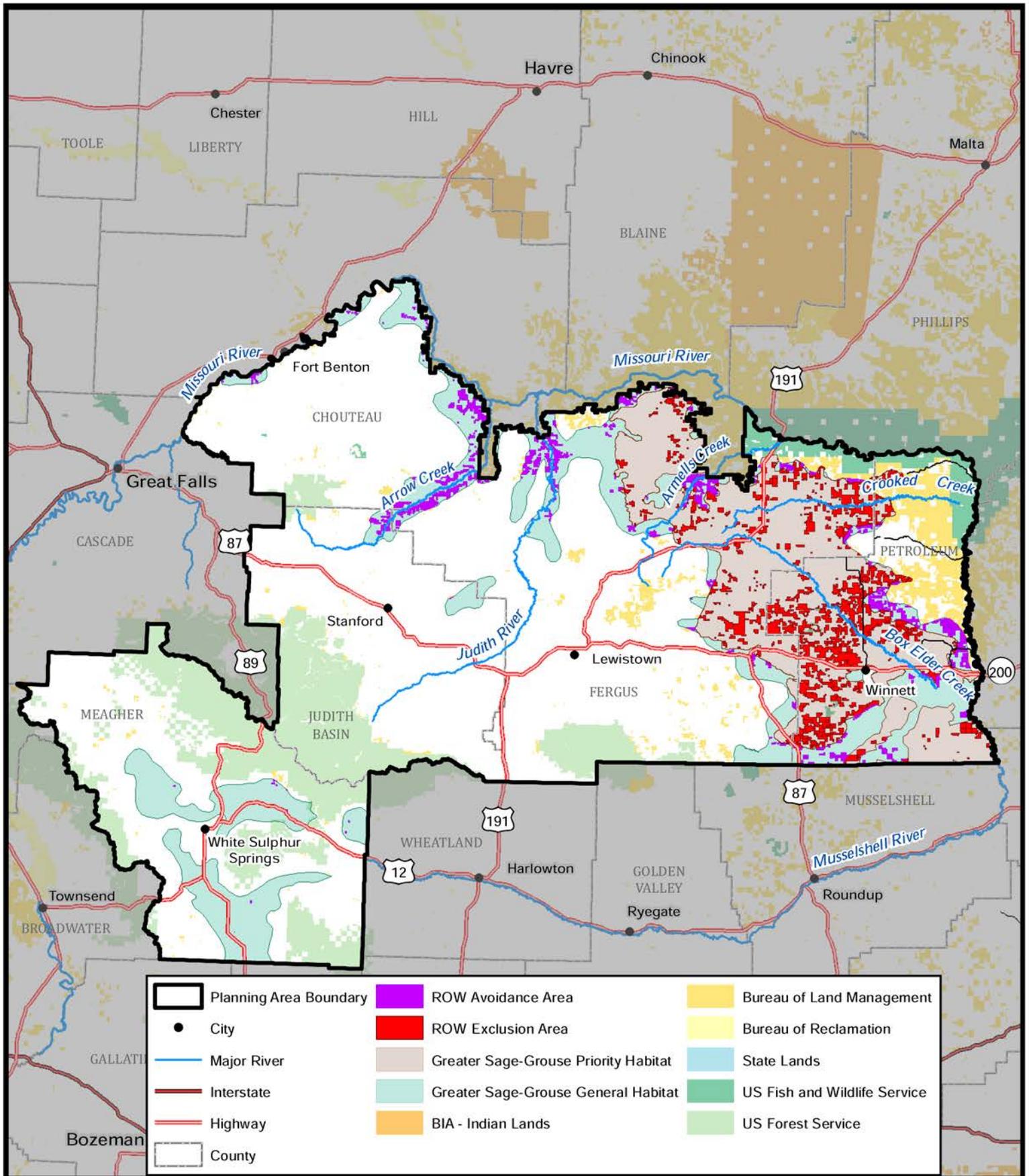
Source: MT FWP 2011



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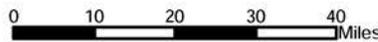
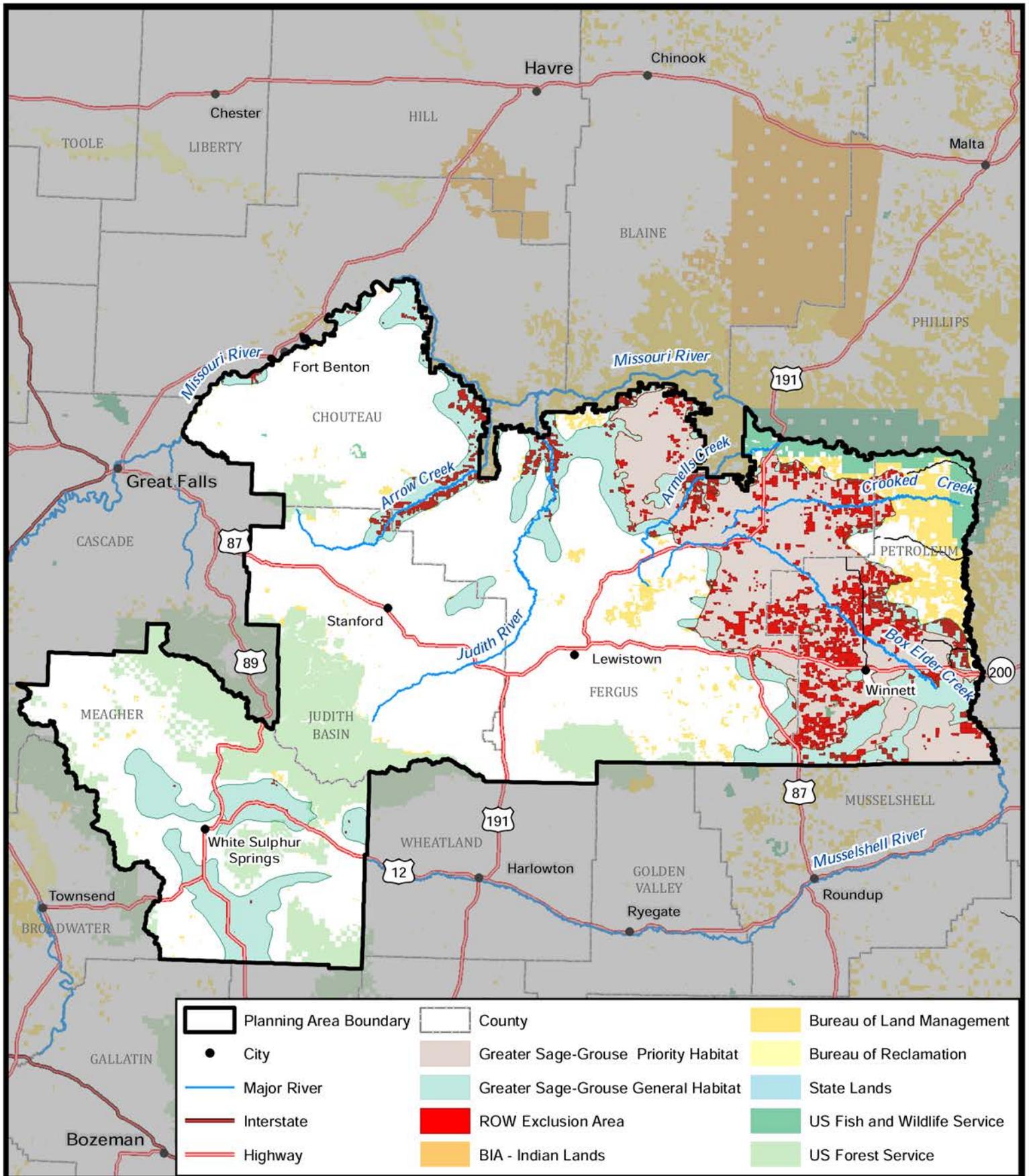
## Rights-of-Way Avoidance Areas - Alternative A

Source: BLM 2012a Figure 2-1



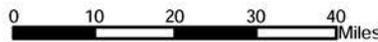
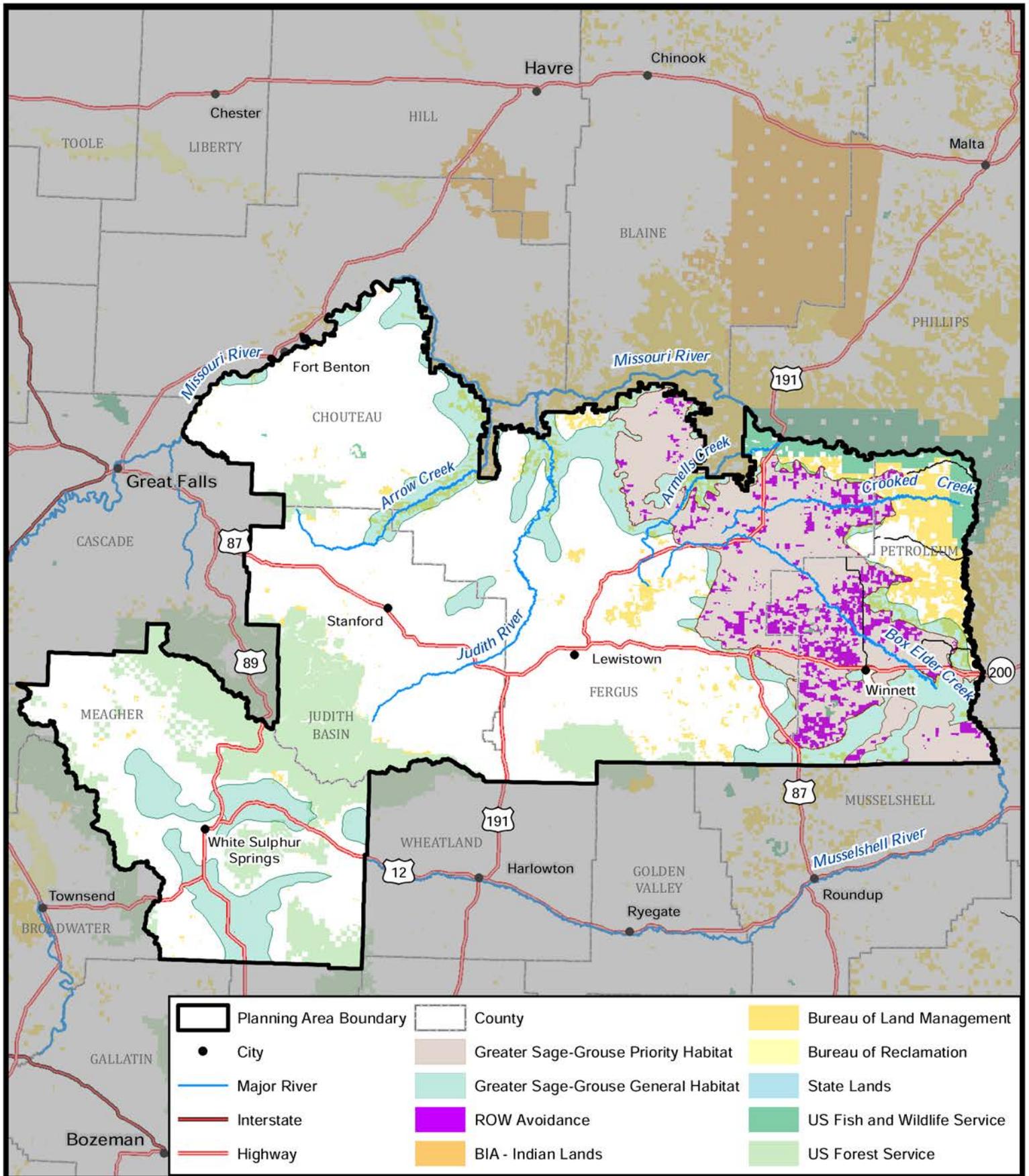
## Rights-of-Way Avoidance and Exclusion Areas - Alternative B

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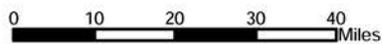
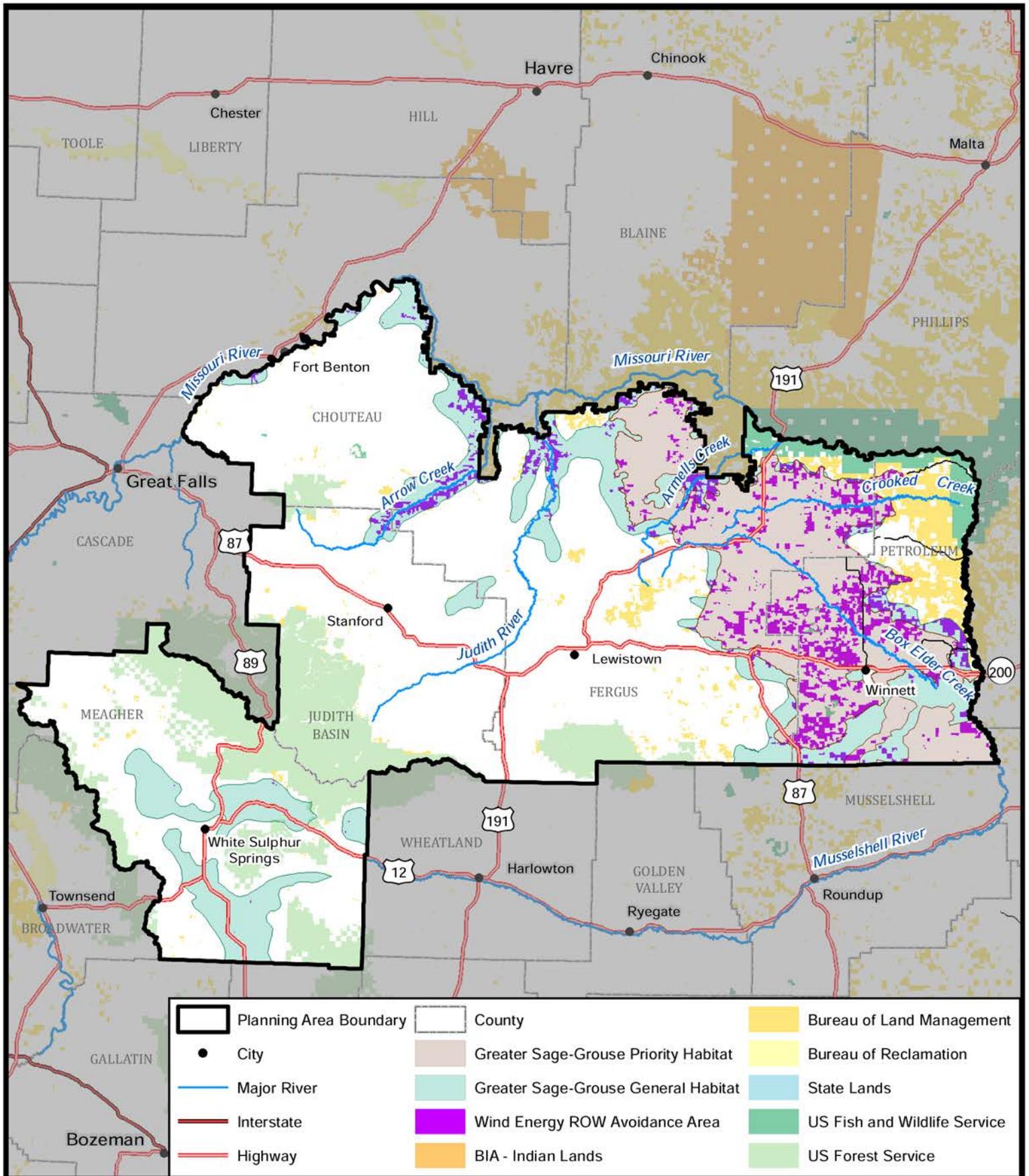
## Rights-of-Way Exclusion Areas - Alternative C



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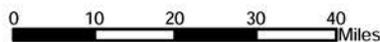
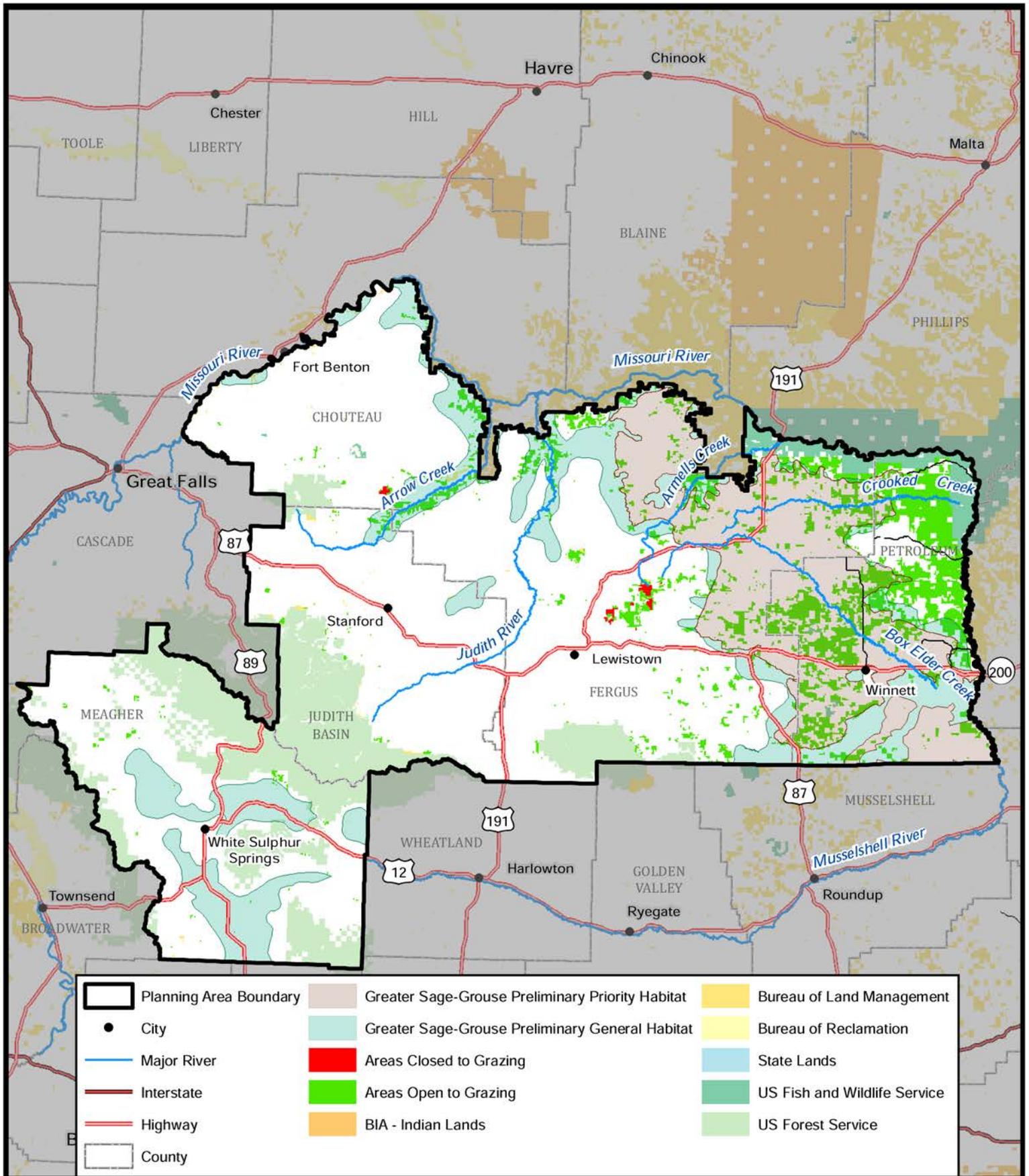
## Rights-of-Way Avoidance Areas - Alternative D

Source: BLM 2012a Figure 2 - 4



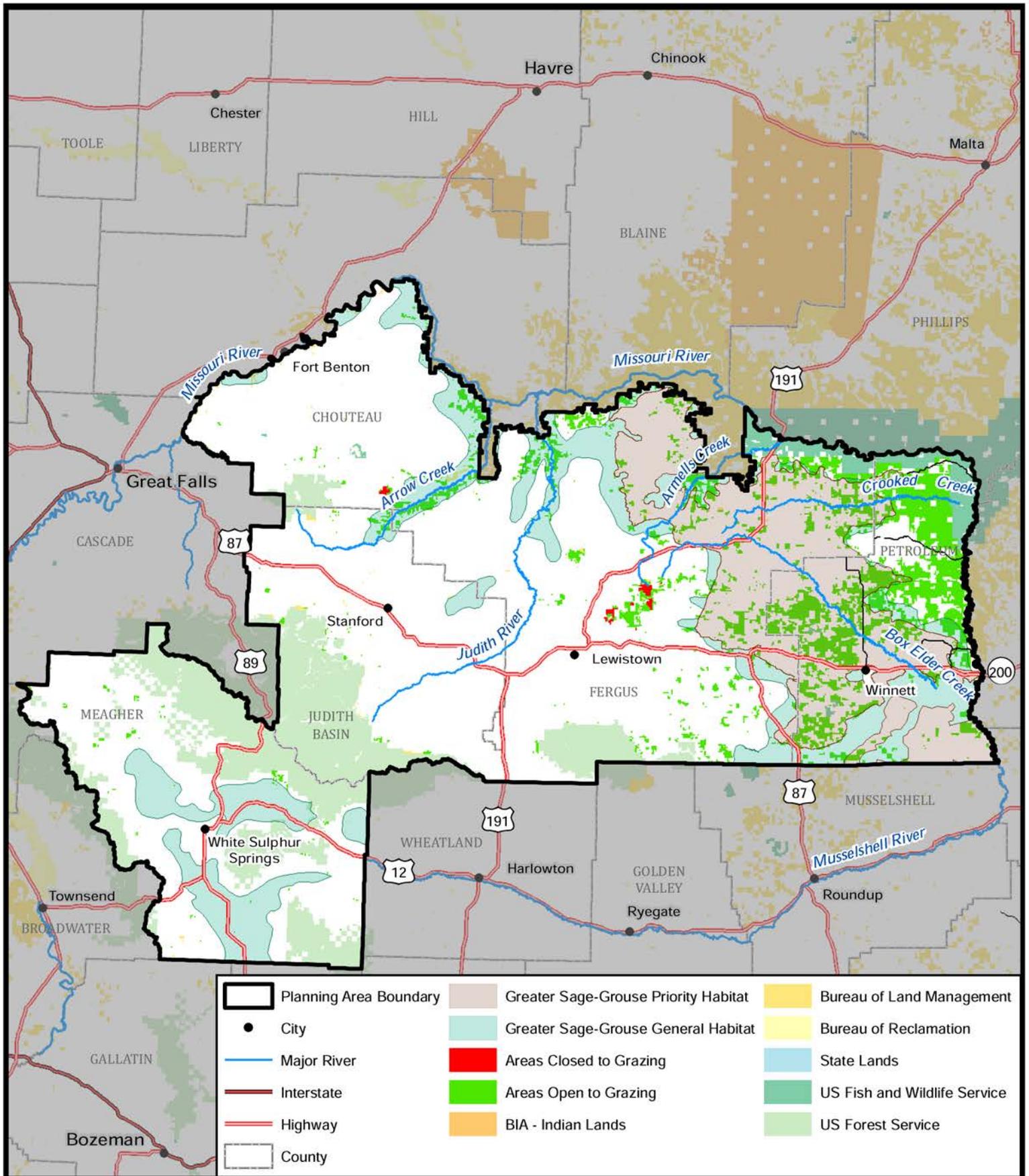
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# Rights-of-Way Wind Energy Avoidance Areas - Alternative D



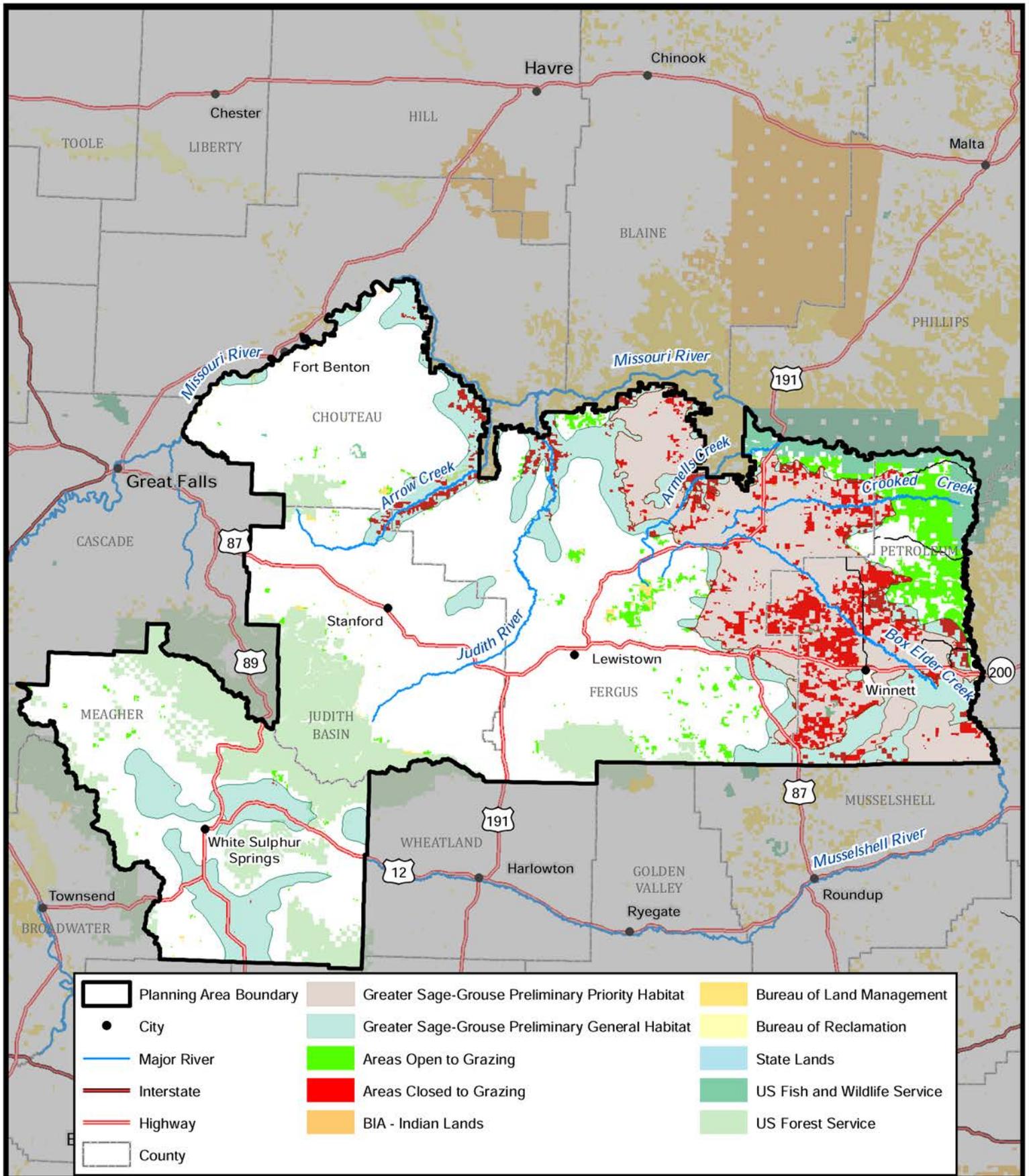
## Grazing Allotments Alternative A

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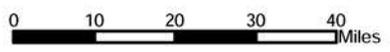
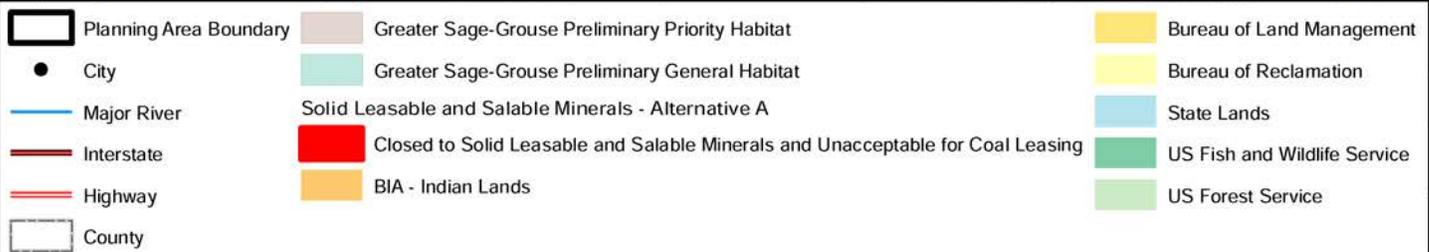
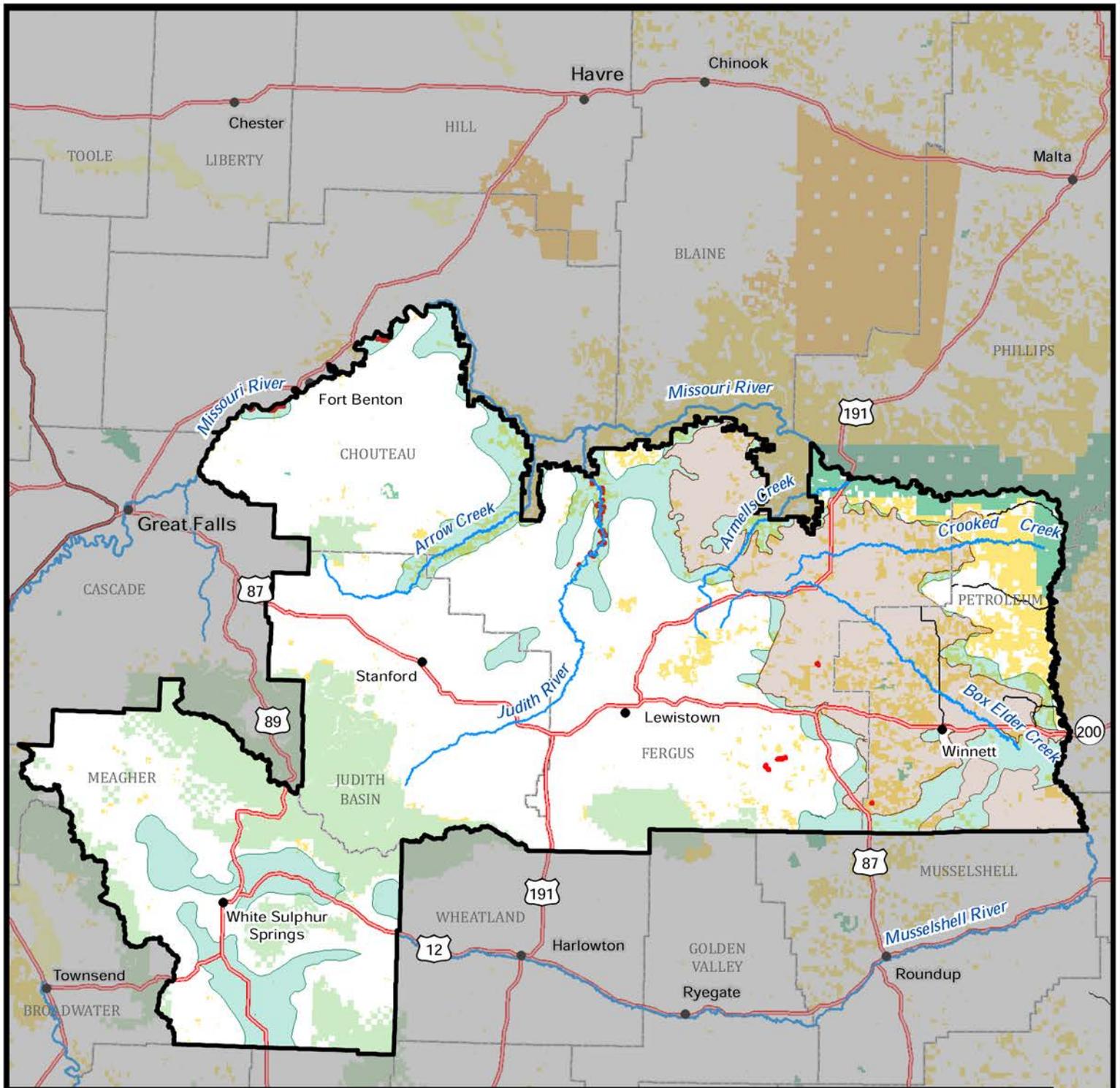
## Areas Open and Closed Grazing Allotments Alternative B & D

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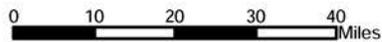
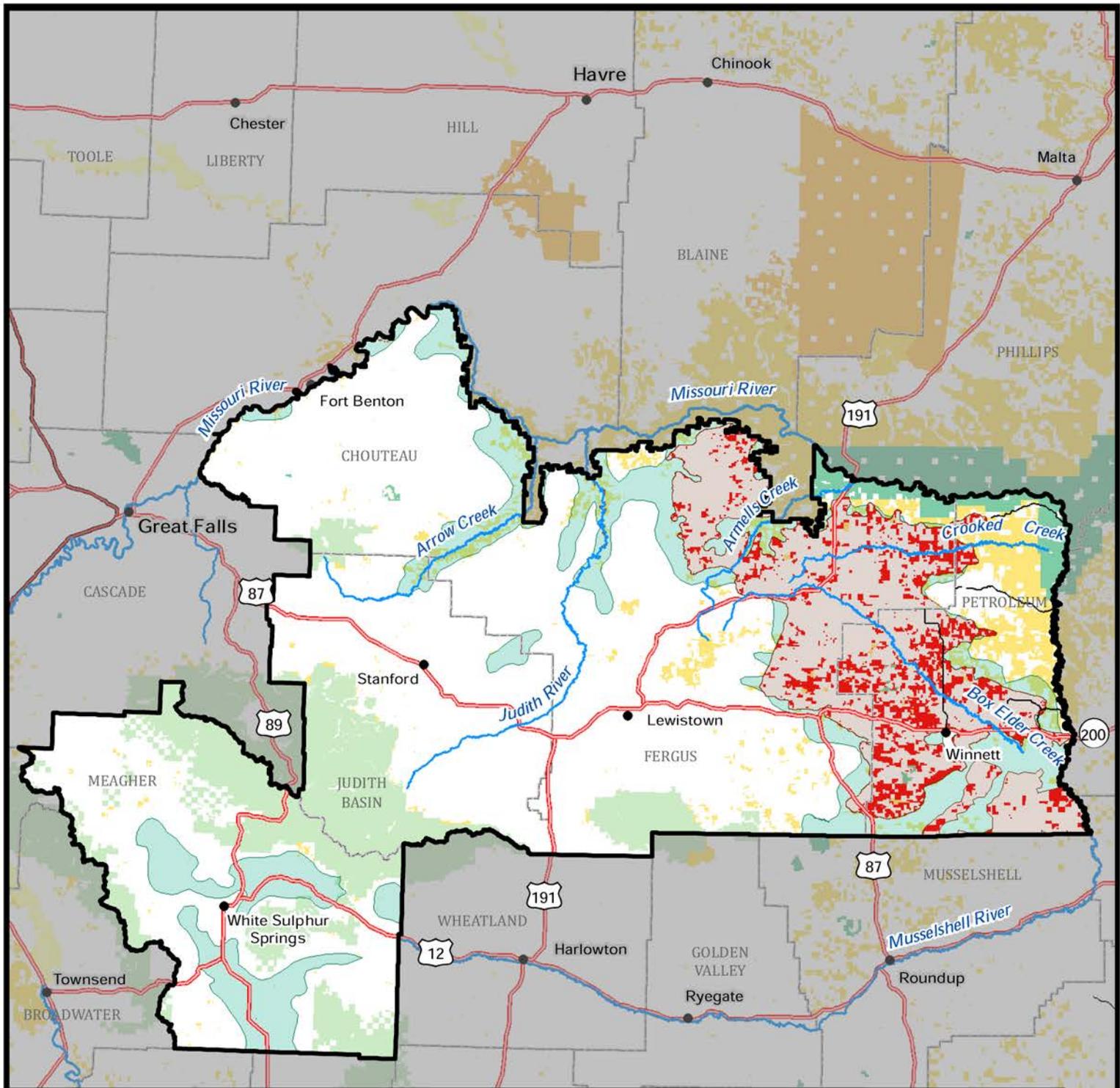
## Areas Open and Closed Grazing Allotments Alternative C

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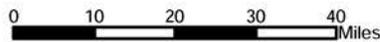
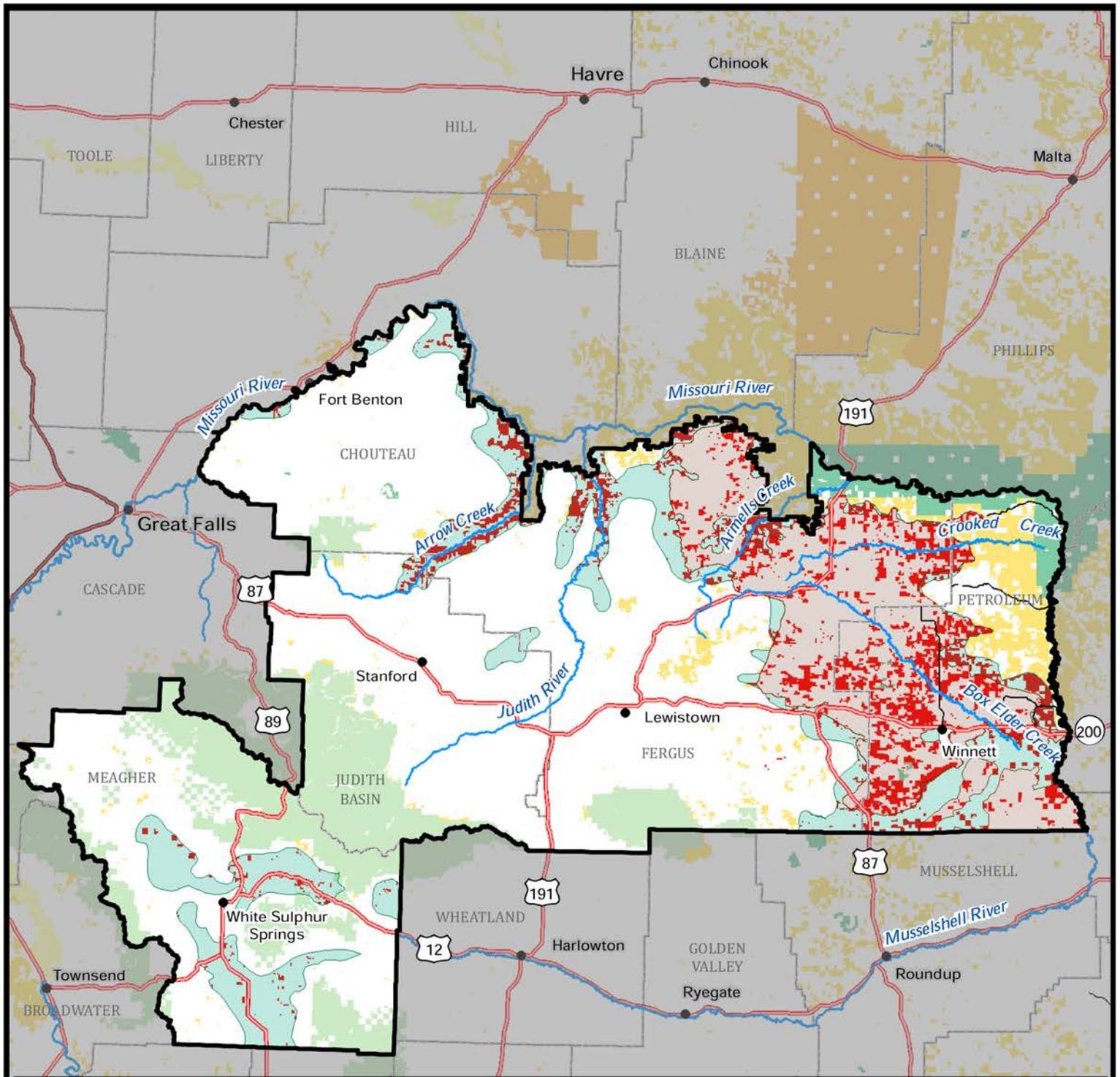
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# Solid Leasable and Salable Minerals - Alternative A



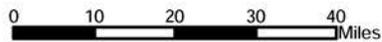
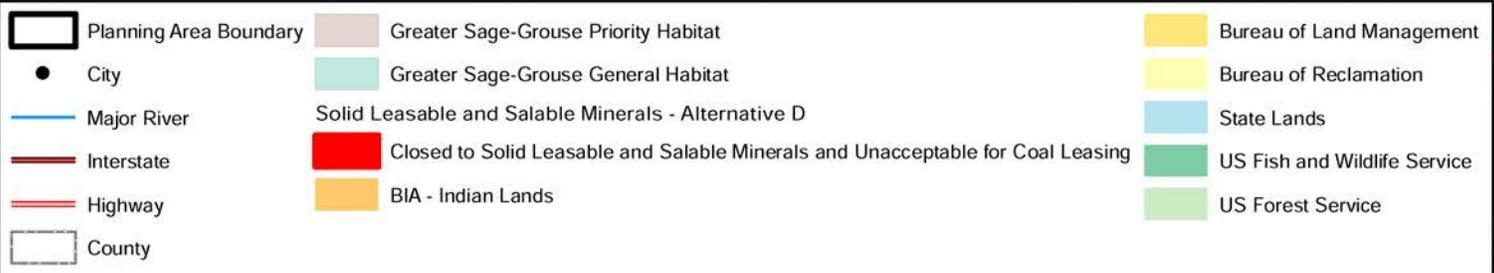
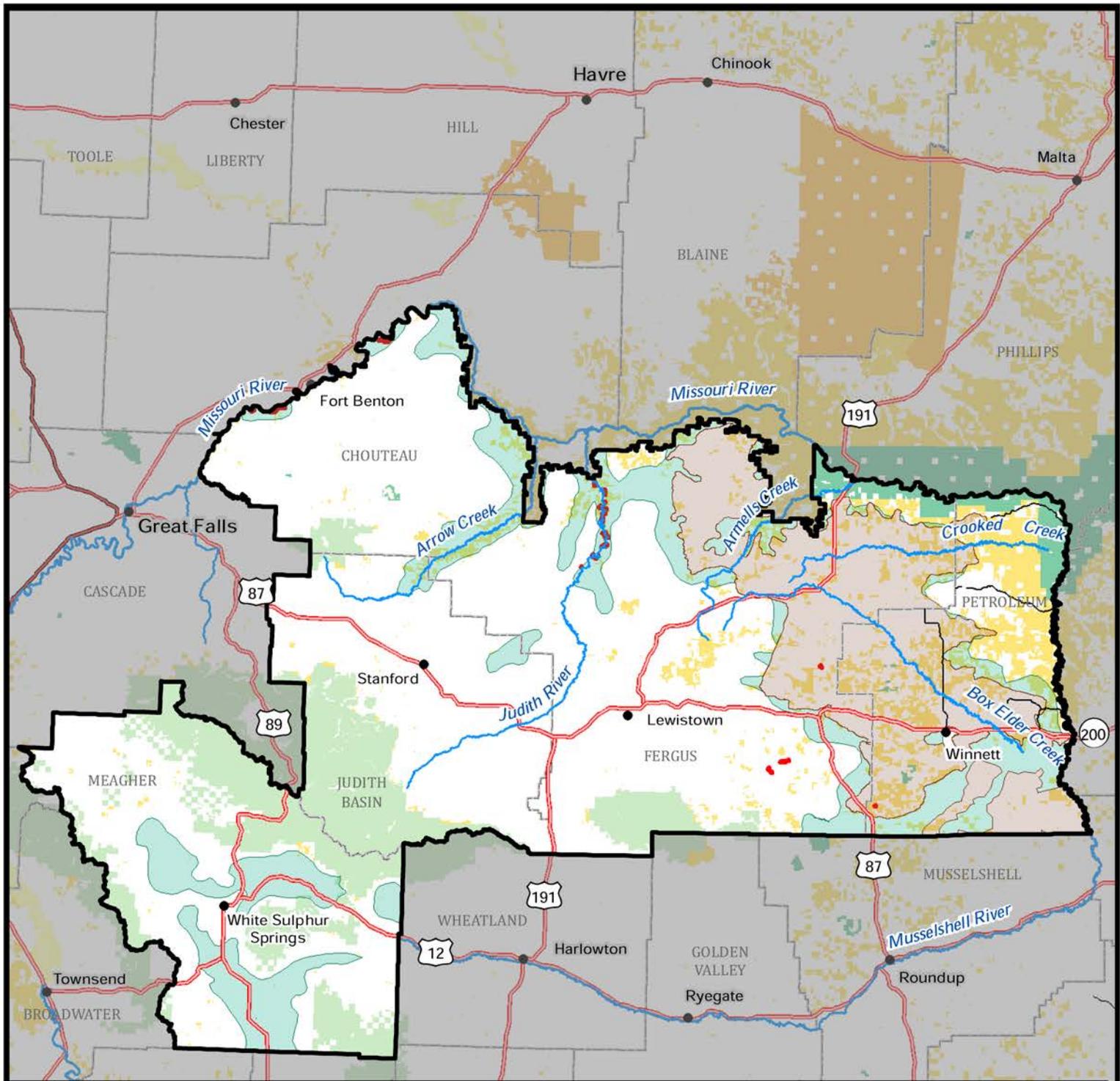
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## Solid Leasable and Salable Minerals - Alternative B



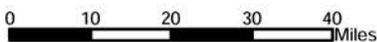
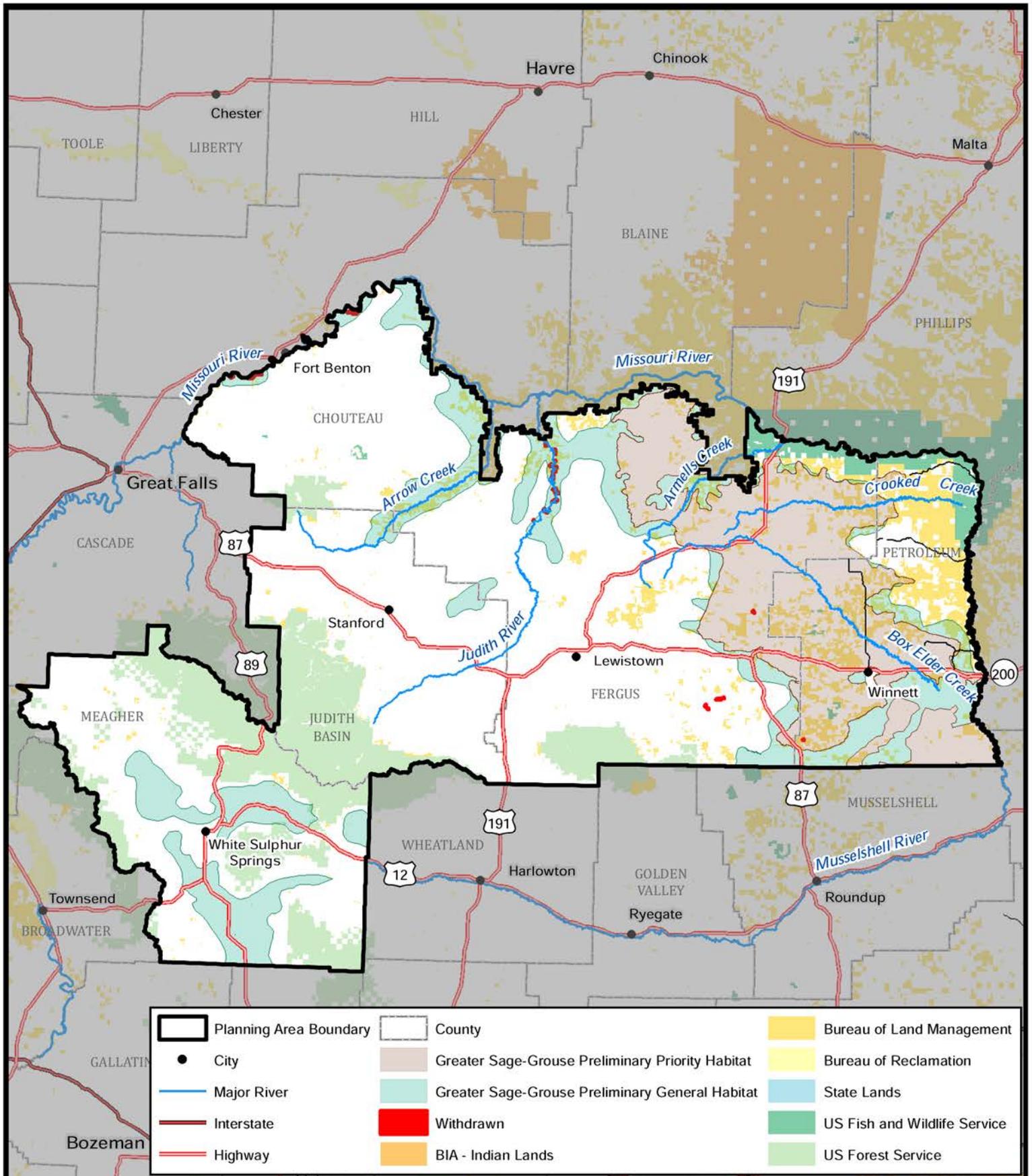
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## Solid Leasable and Salable Minerals - Alternative C



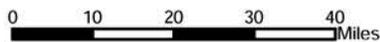
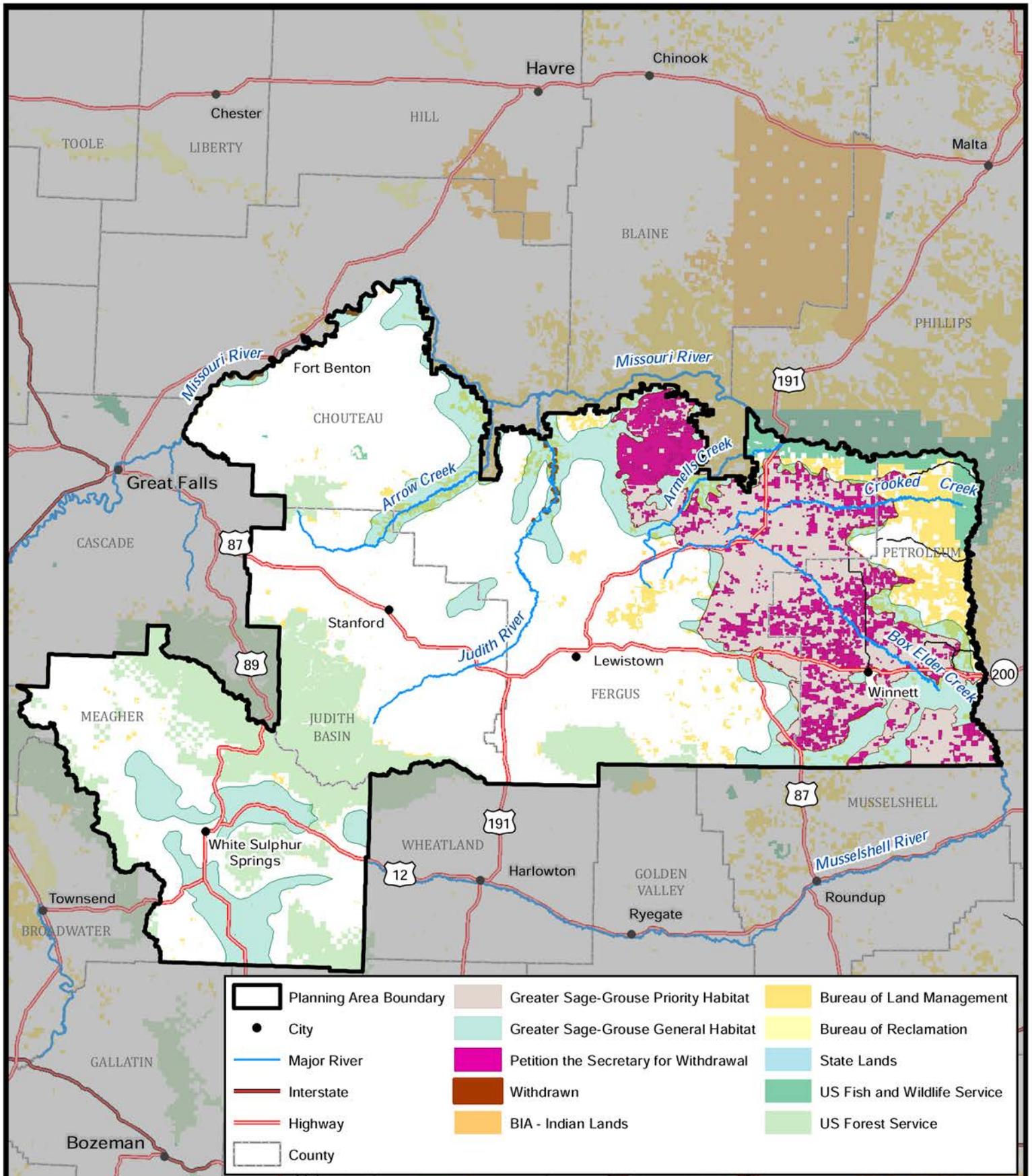
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# Solid Leasable and Salable Minerals - Alternative D



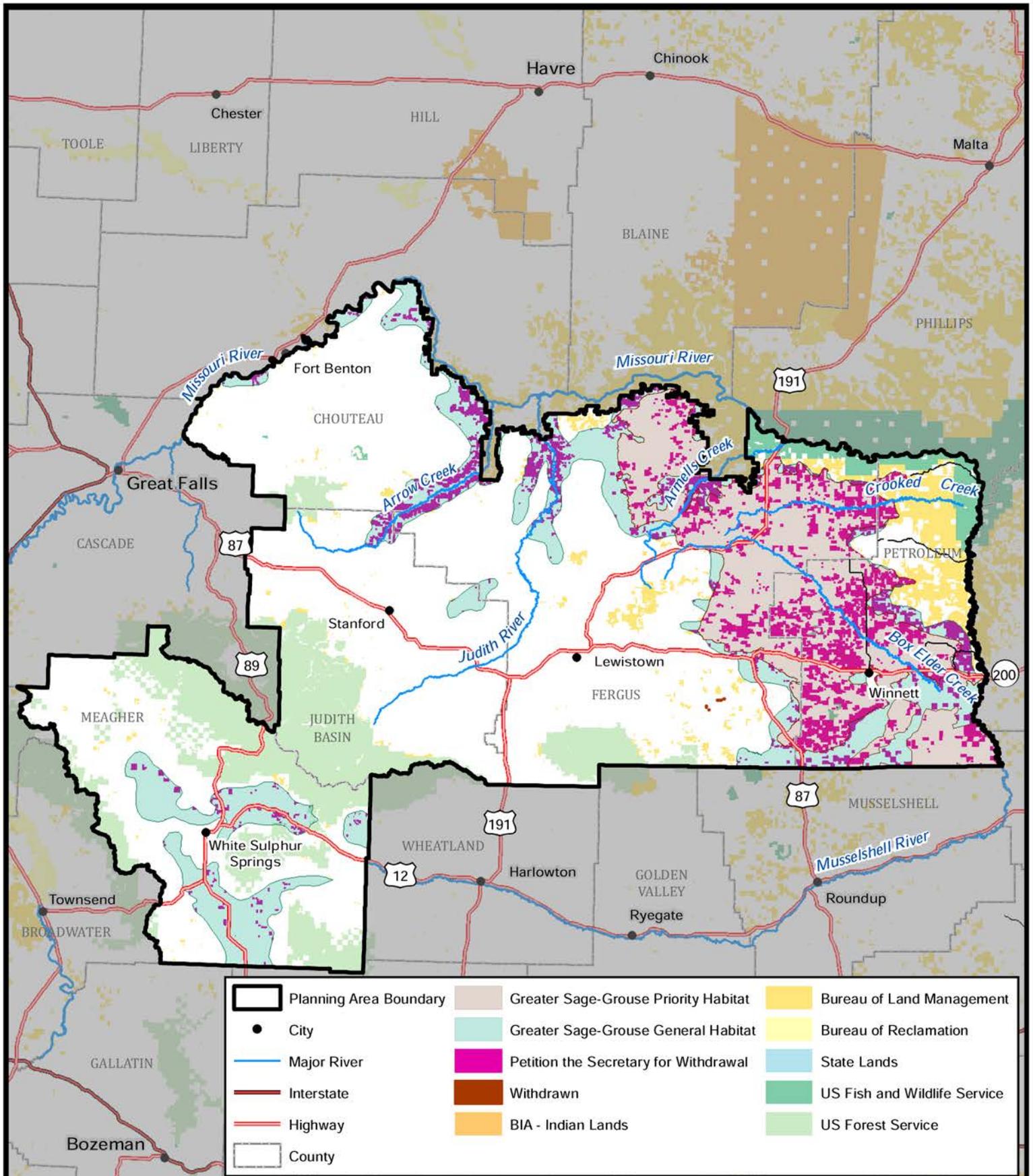
## Withdrawals and Recommendations for Withdrawal - Alternative A

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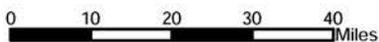


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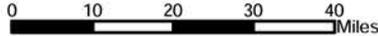
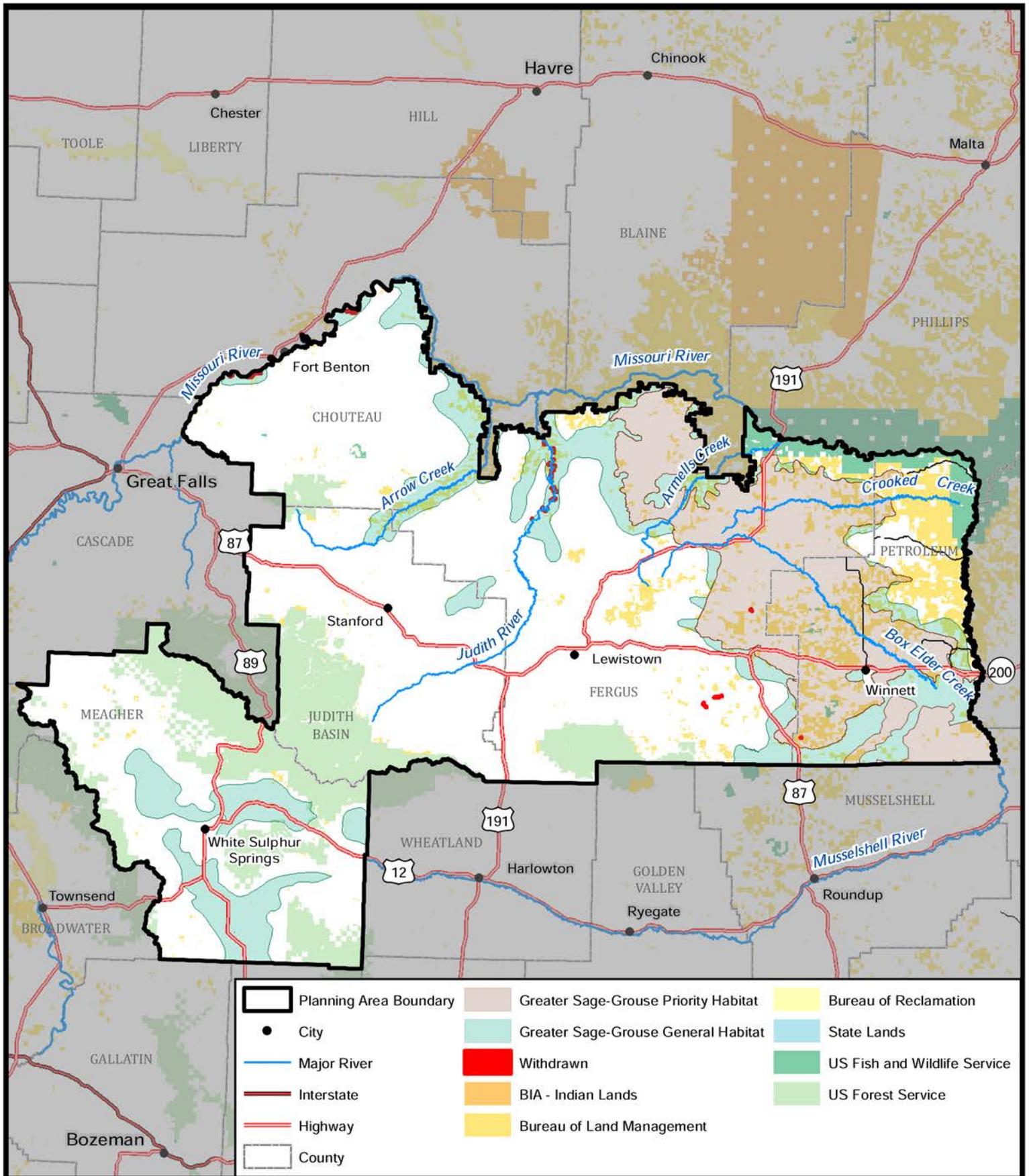
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## Withdrawals and Recommend for Withdrawal - Alternative C

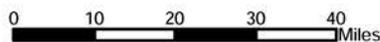
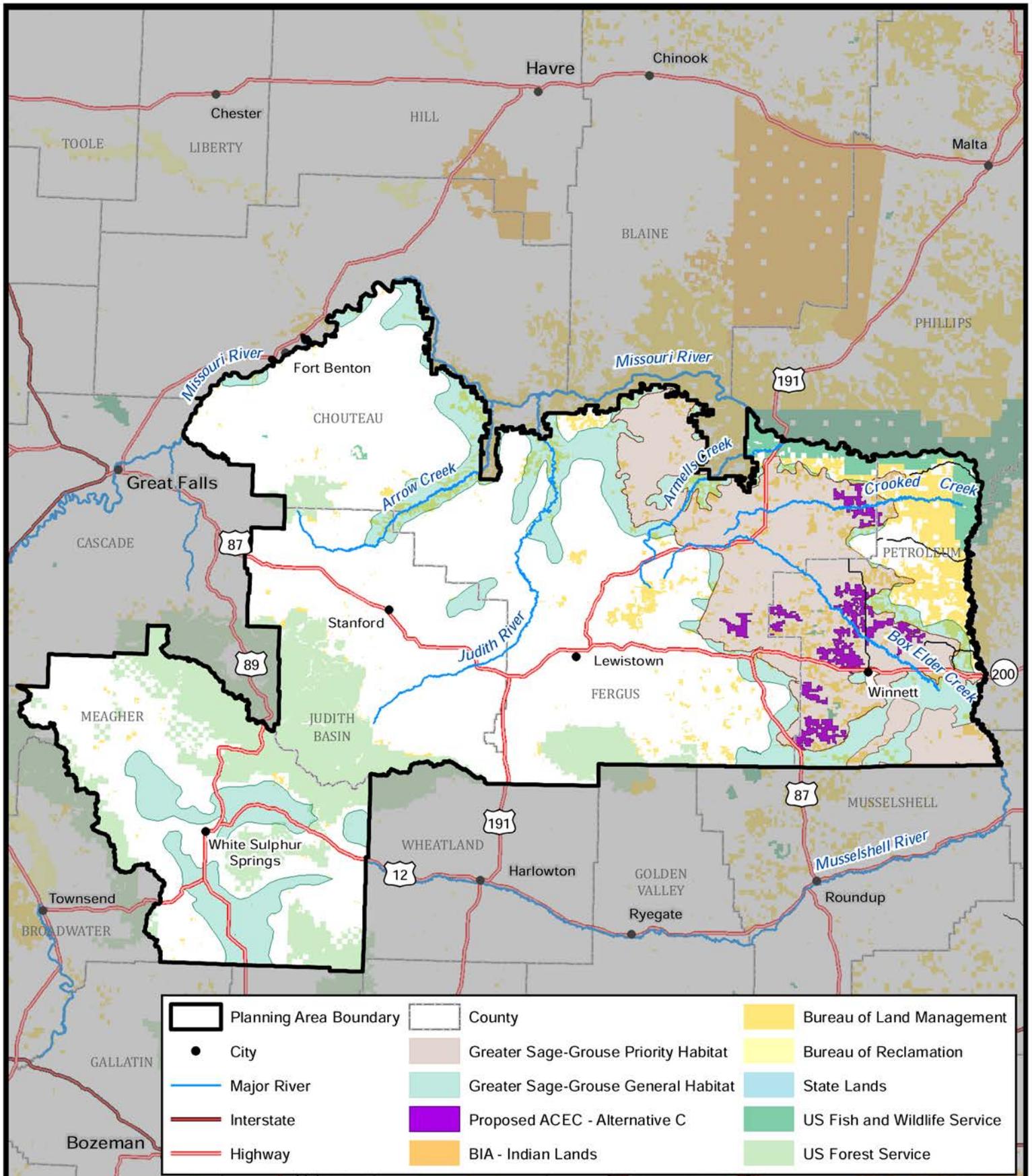


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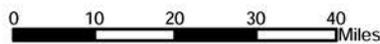
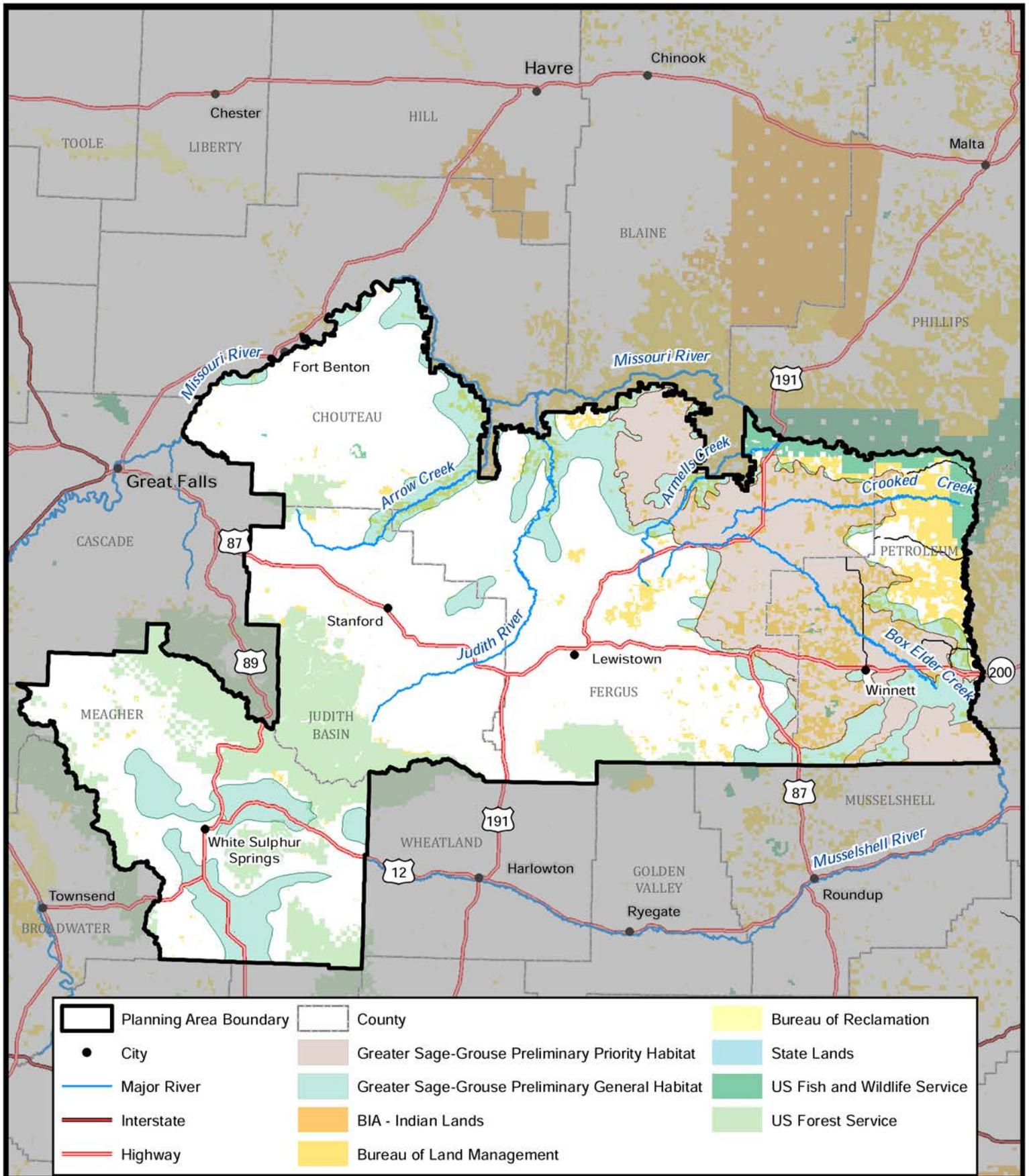
## Withdrawals and Recommendations for Withdrawal - Alternative D

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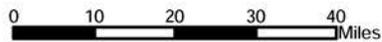
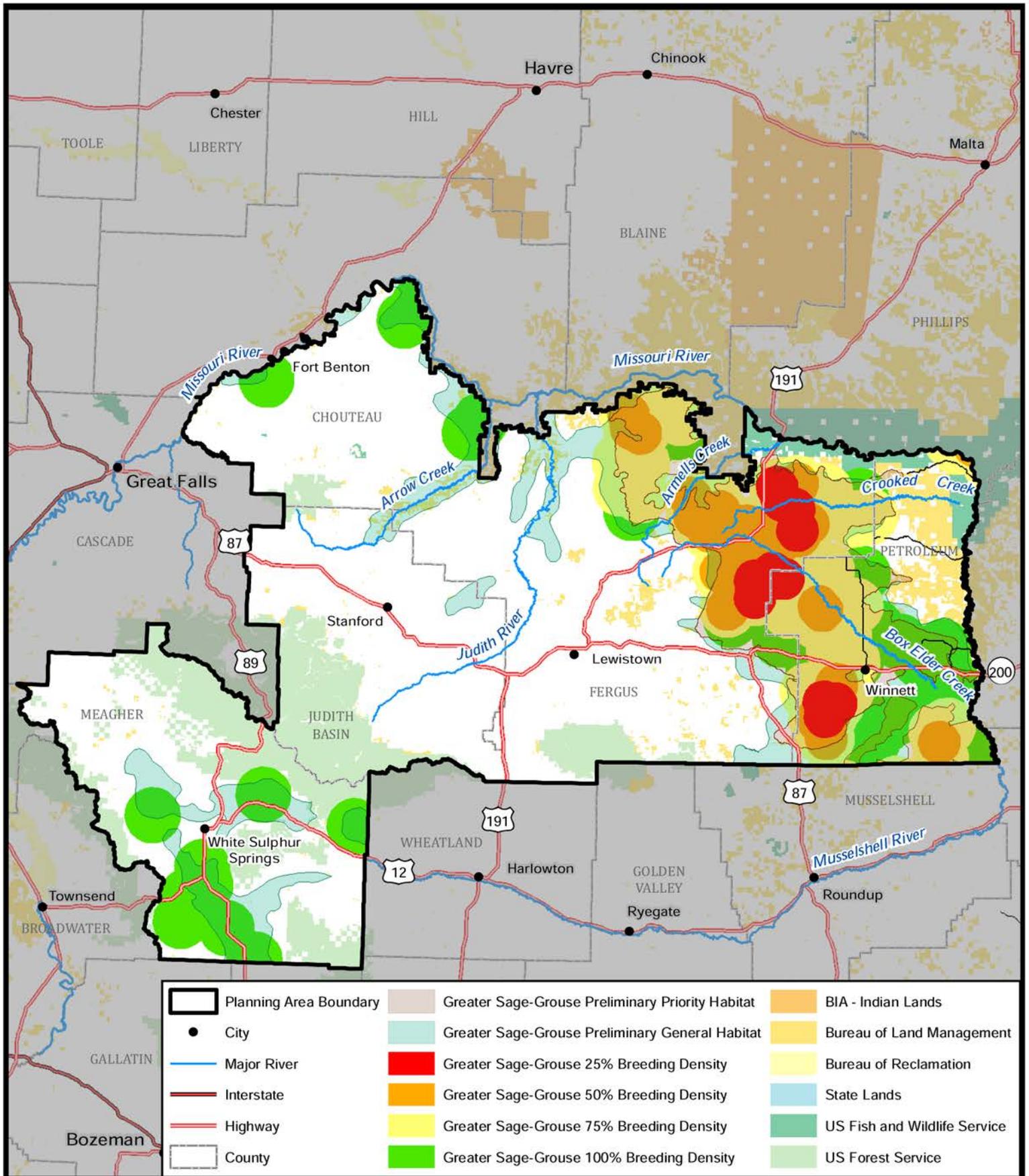
## Area of Critical Environmental Concern - Alternative C



# Greater Sage-Grouse Habitat

Source: MT FWP 2011

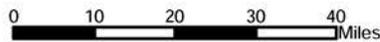
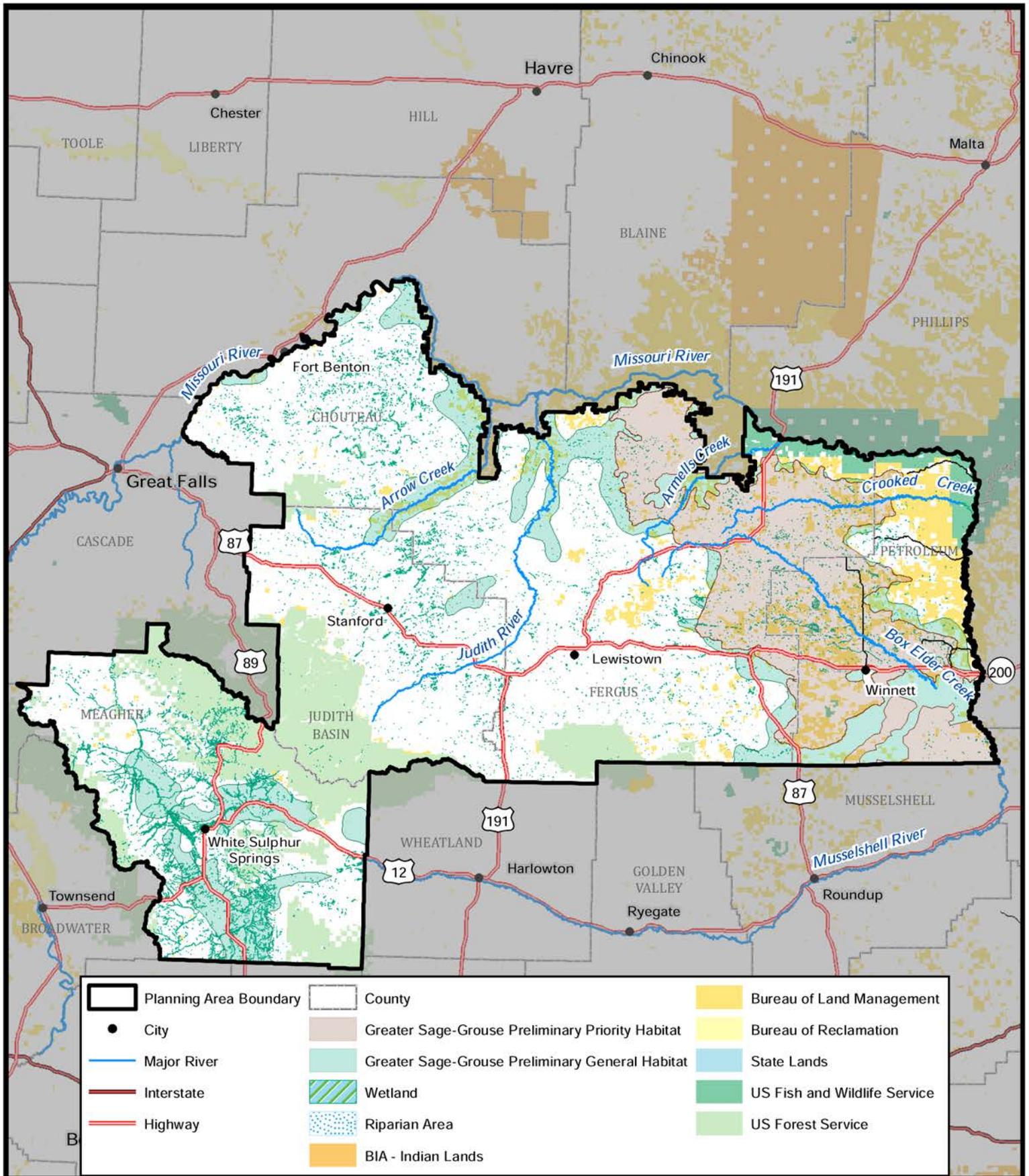
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# Greater Sage-Grouse Breeding Density

Source: MT FWP 2011

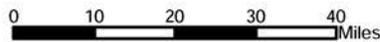
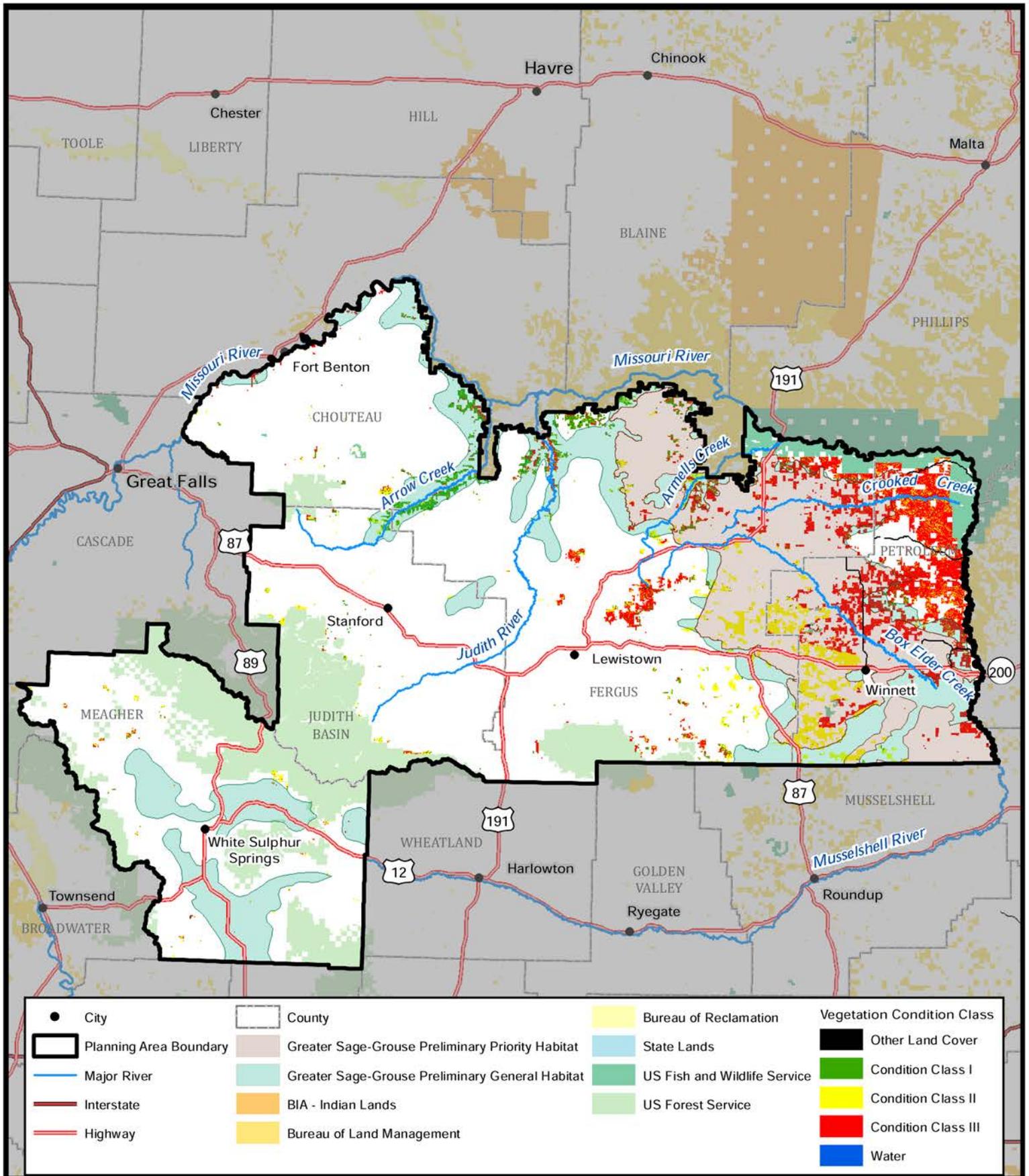
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## Wetland and Riparian Areas

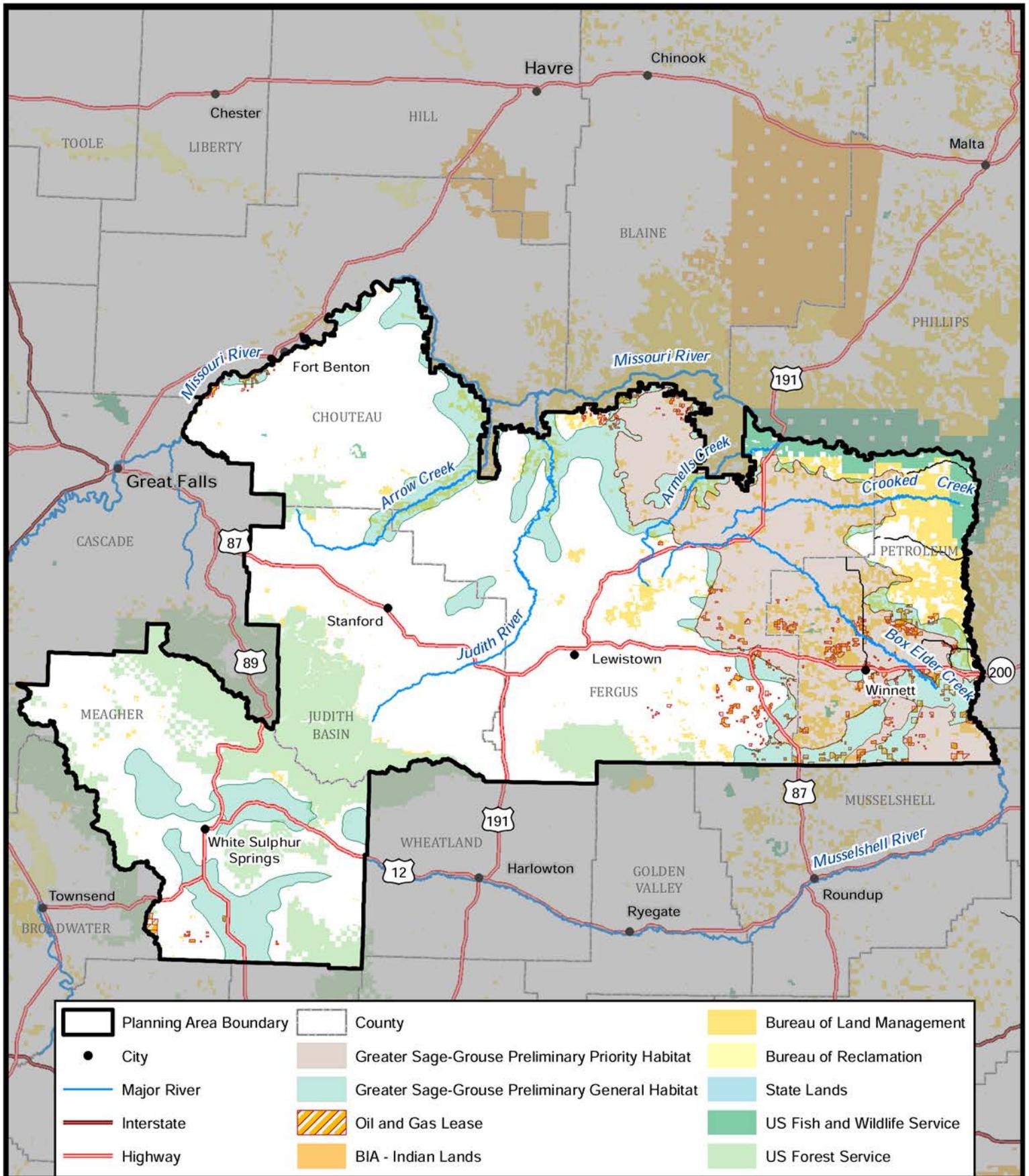
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Source: USGS NHD 2012

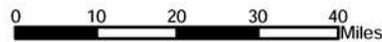


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## Fire Regime Condition Class

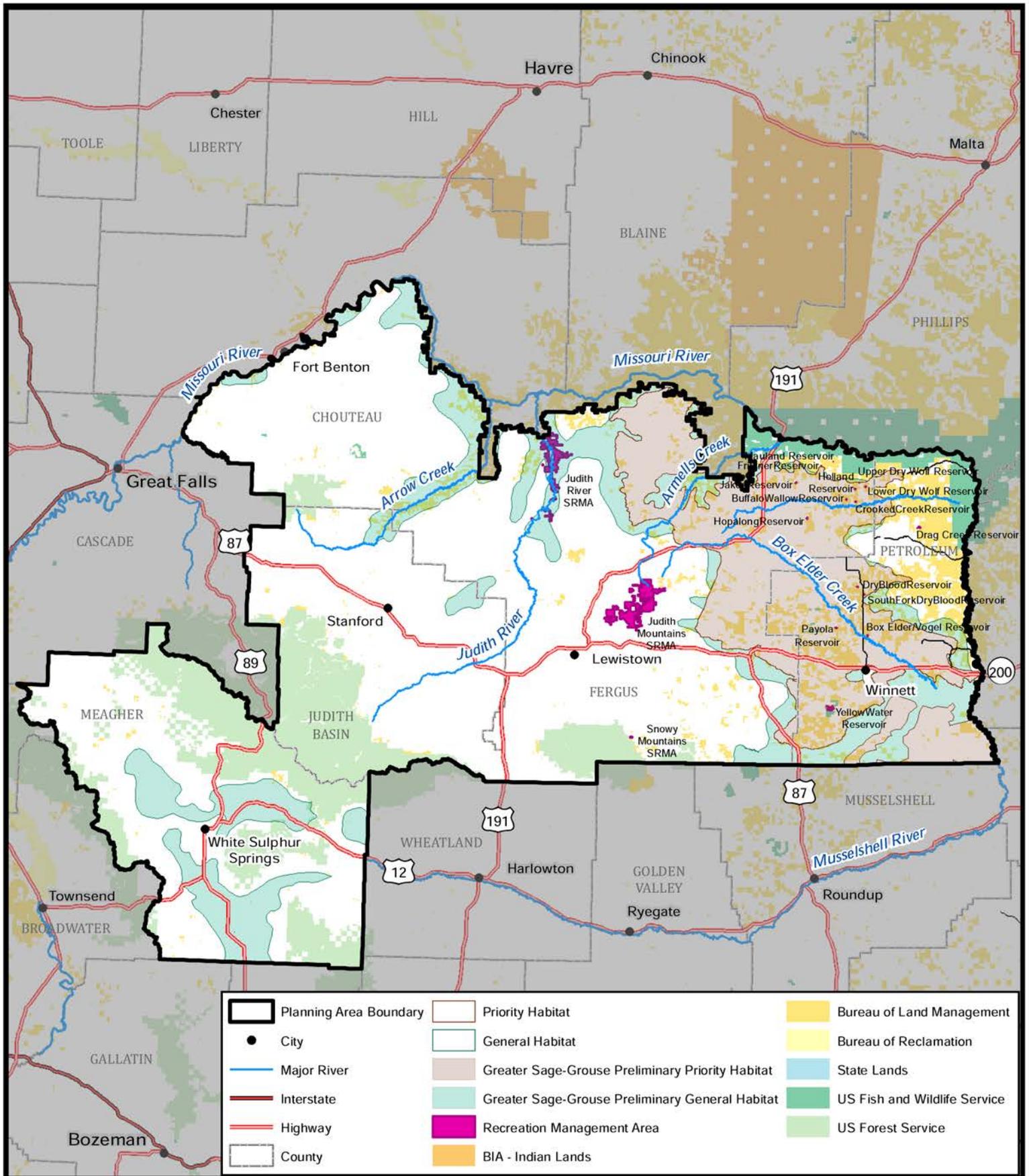


Planning Area Boundary	County	Bureau of Land Management
City	Greater Sage-Grouse Preliminary Priority Habitat	Bureau of Reclamation
Major River	Greater Sage-Grouse Preliminary General Habitat	State Lands
Interstate	Oil and Gas Lease	US Fish and Wildlife Service
Highway	BIA - Indian Lands	US Forest Service



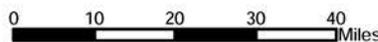
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## Fluid Minerals - Existing Leases

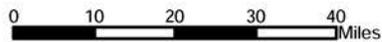
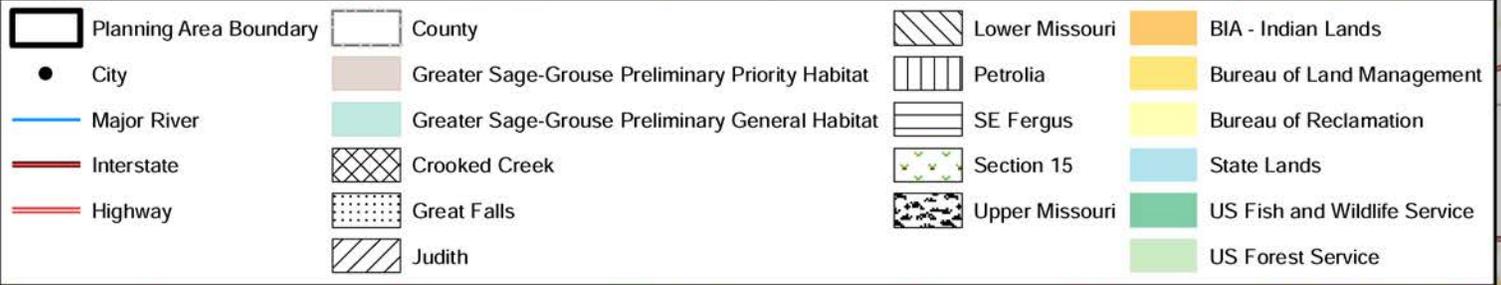
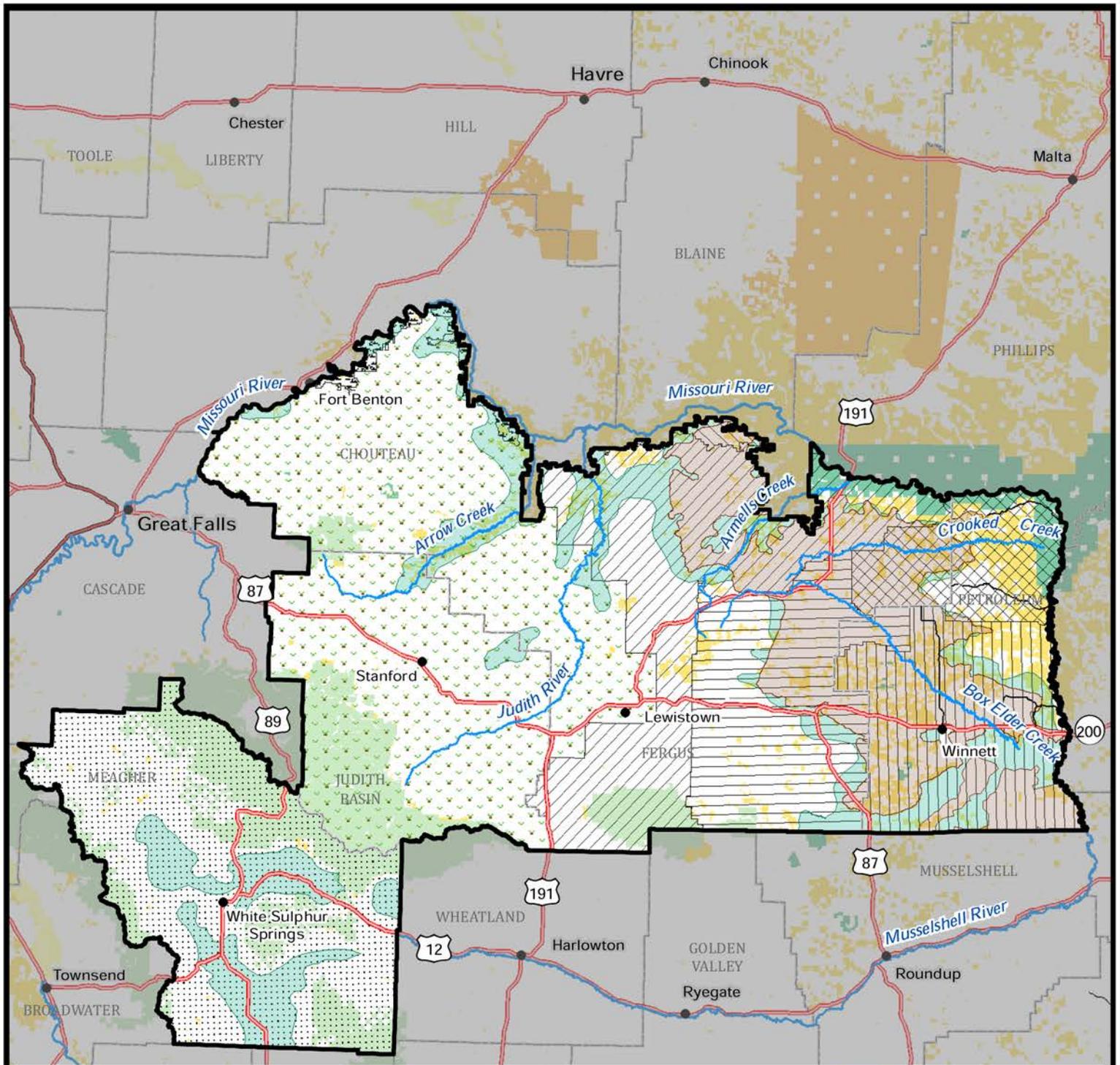


# Recreation Management Areas

Source: BLM JVP 1992

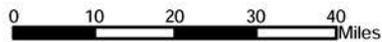
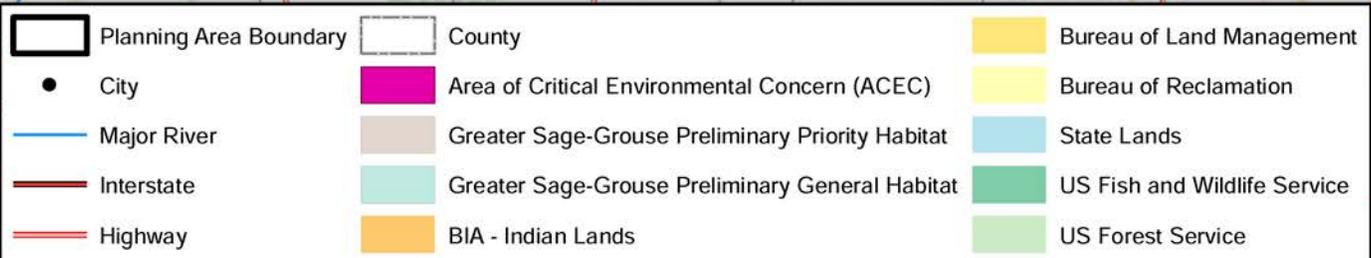
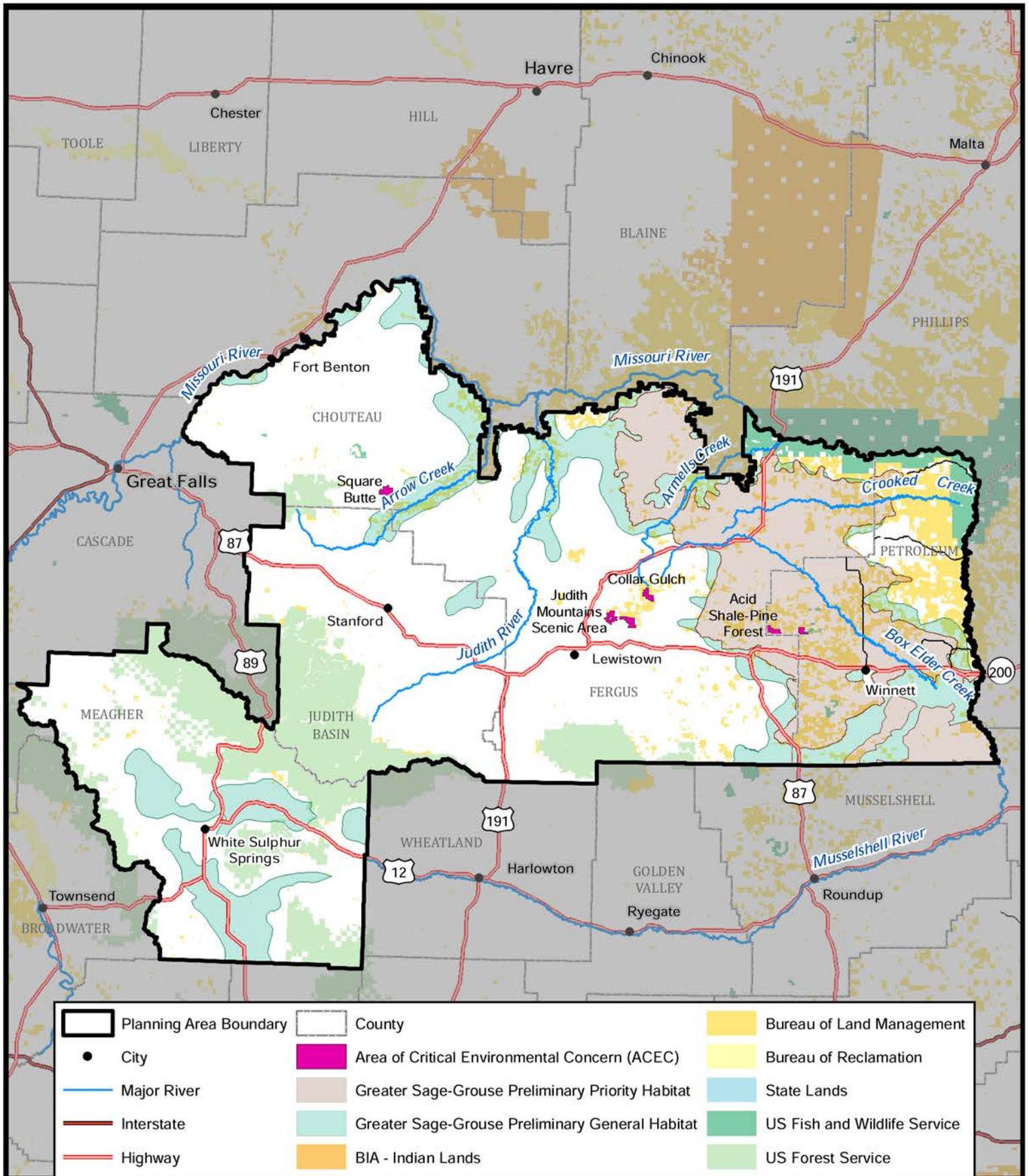


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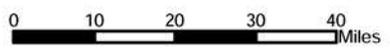
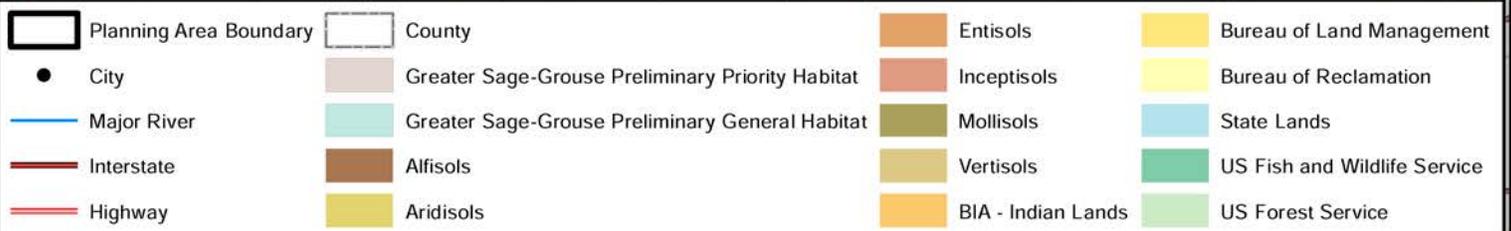
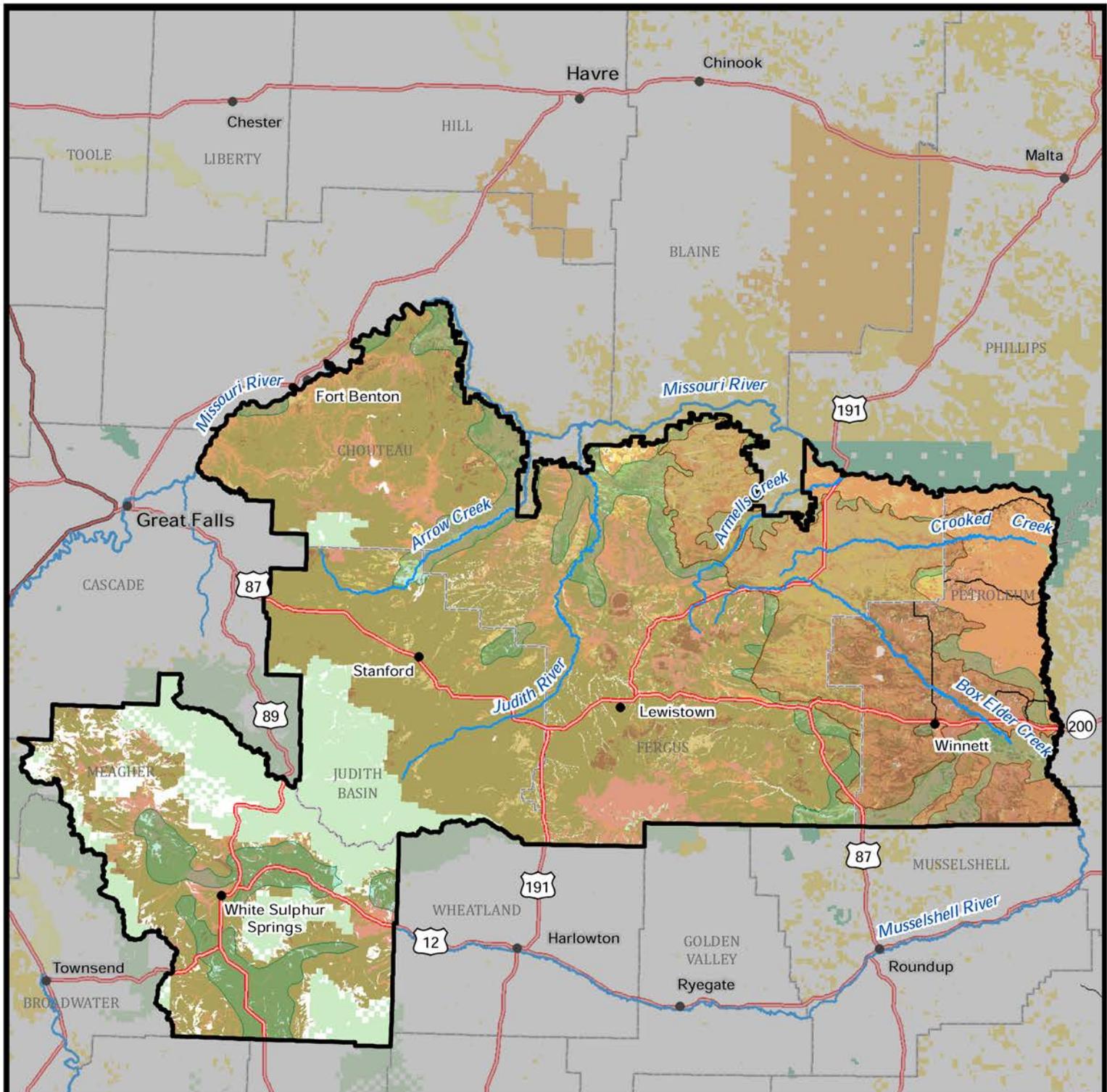
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# Resource Activity Plans - Grazing Authorization Renewal Areas



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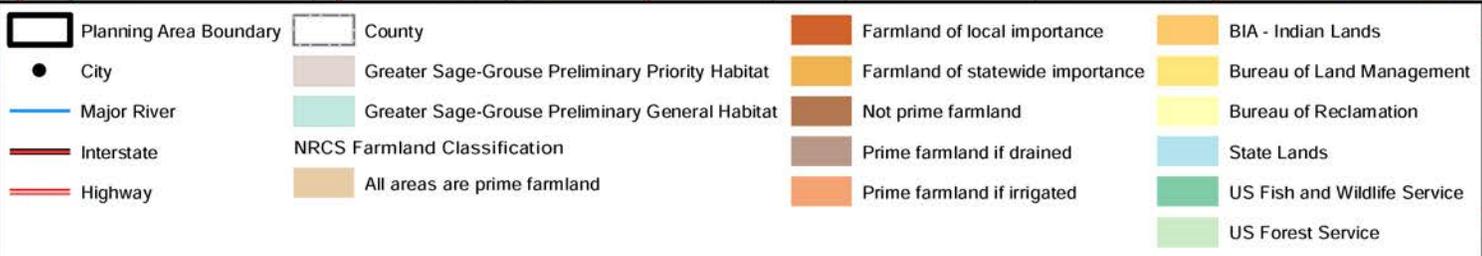
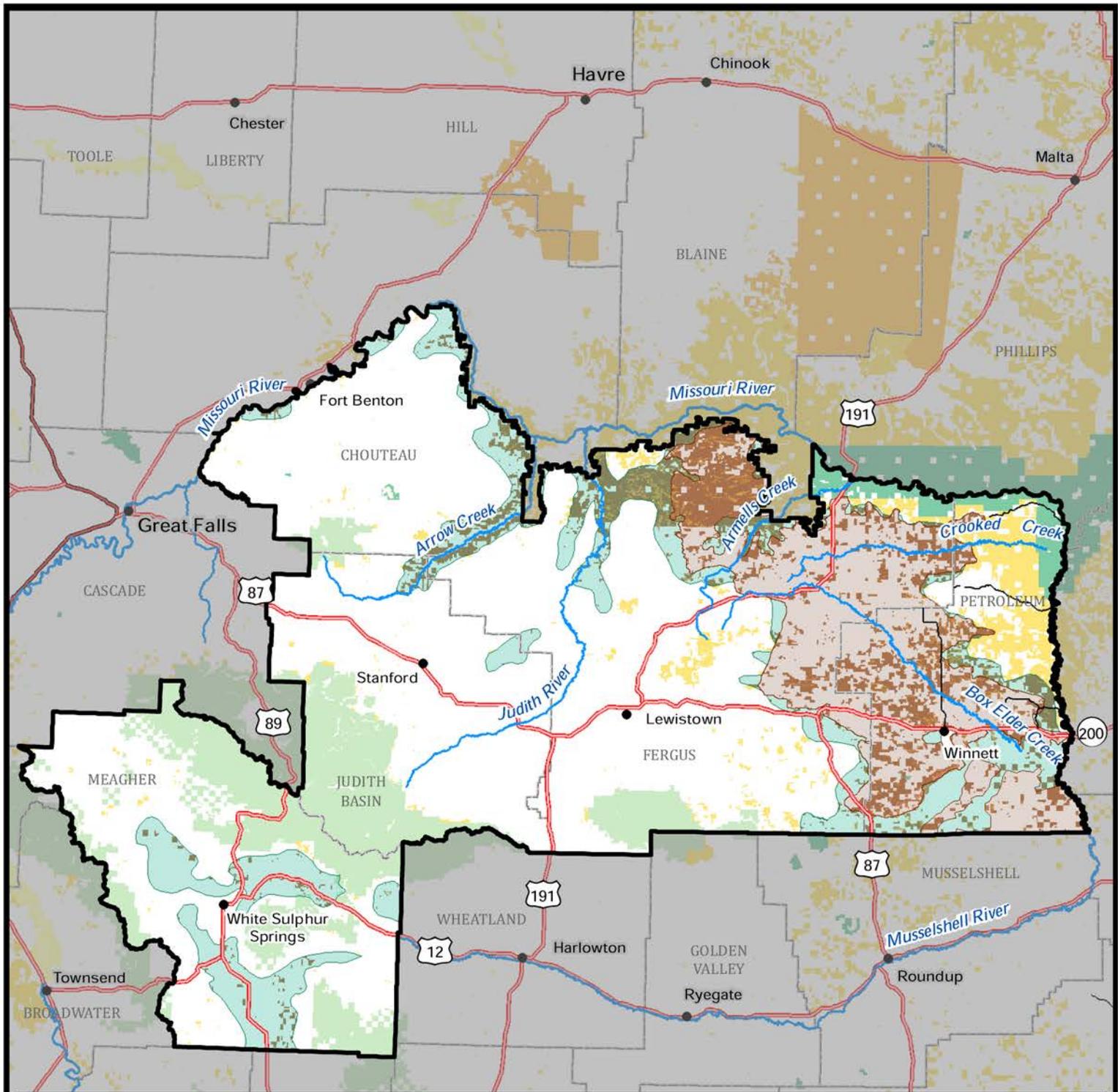
# Areas of Critical Environmental Concern



# Major Soil Orders

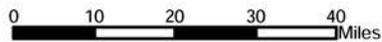
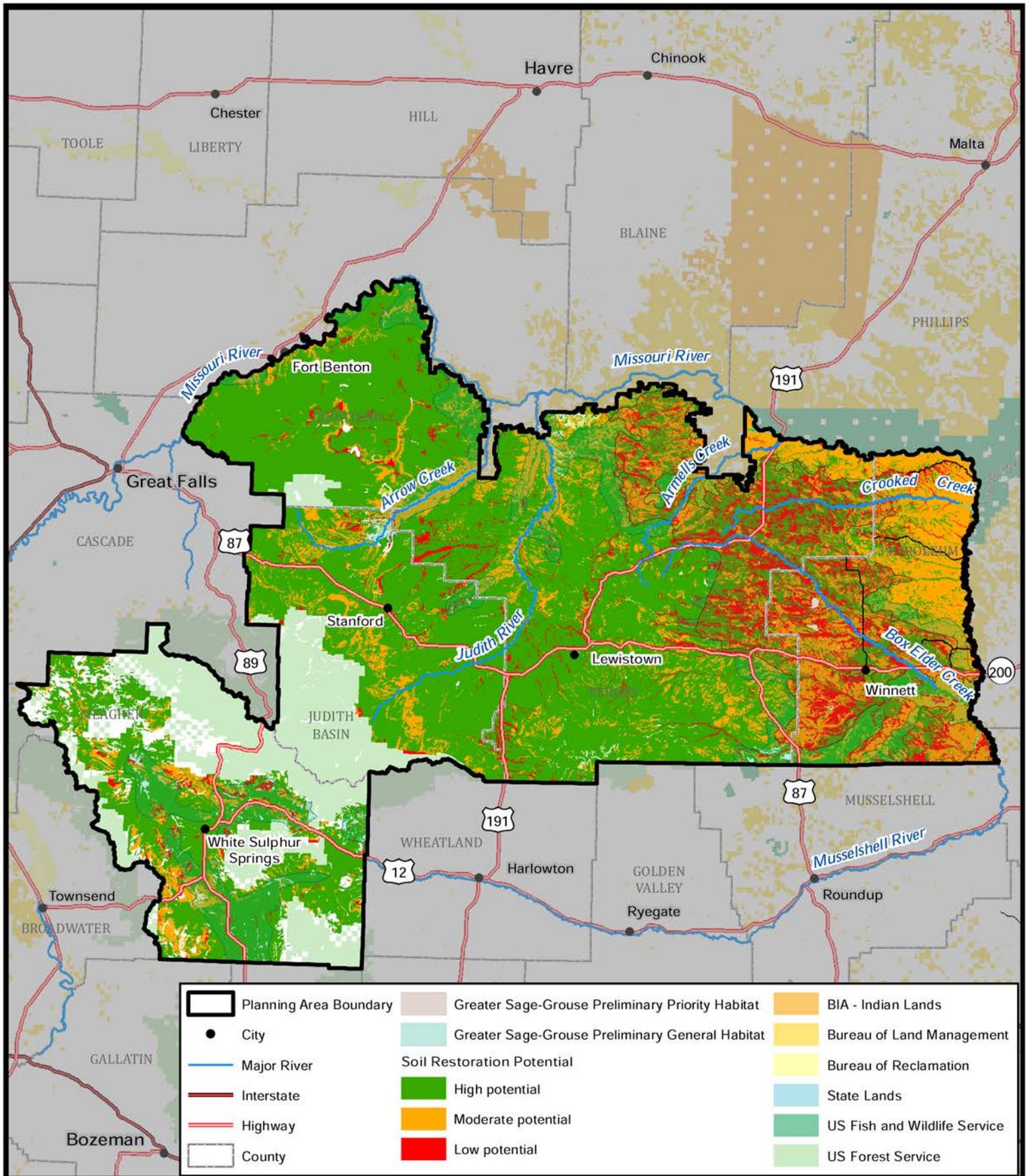
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Source: NRCS 2012



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

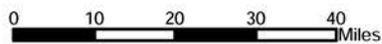
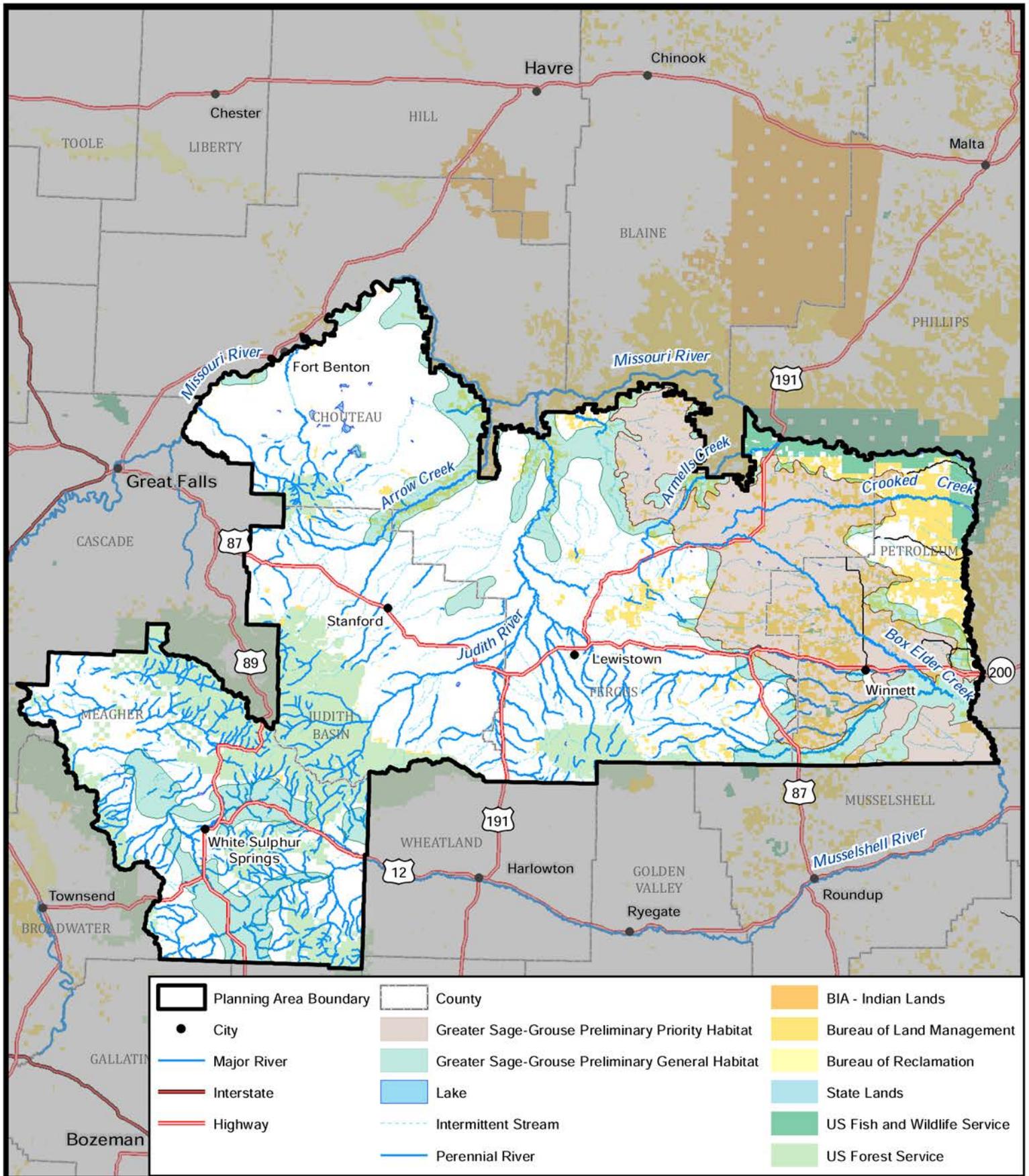
# NRCS Farmland Classification



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

## Soil Restoration Potential

Source: NRCS 2012



# Water Features

Source: USGS NHD 2012

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

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# Appendix B

## Greater Sage-Grouse Draft Monitoring Framework



# **APPENDIX B**

## **GREATER SAGE-GROUSE DRAFT MONITORING FRAMEWORK**

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### **INTRODUCTION**

The purpose of this Draft US Bureau of Land Management (BLM) Greater Sage-grouse Monitoring Framework (hereafter, draft monitoring framework) is to evaluate the implementation and success of the BLM resource management plans (RMP) in maintaining and restoring habitat conditions necessary to support sustainable greater sage-grouse (hereafter, sage-grouse) populations. Monitoring data will also be used to help inform adaptive management under these plans.

This draft framework outlines the general monitoring approach, consisting of implementation monitoring and effectiveness monitoring. Implementation monitoring will evaluate whether (and to what extent) the RMP decisions to ameliorate threats to sage-grouse have been implemented. Effectiveness monitoring will consist of a multi-scale analysis of our habitat and disturbance monitoring data. Best available population data, provided by the states, will be used to supplement effectiveness analysis.

This draft monitoring framework establishes the use of measurable quantitative indicators for habitat availability and maintenance of habitat types (e.g., priority and general habitats) to ensure BLM's ability to make broad (yet consistent) generalizations about habitat across the range of the species. Monitoring methods and indicators are derived from the best available science. Corporate data-sets will be established or acquired so that data can easily be "rolled up" for reporting monitoring results across the range of sage-grouse, as defined by Schroeder et al. (2004); by populations and subpopulations as defined by Connelly et al. (2004); by RMP area; by the six Western Association of Fish and Wildlife Agencies (WAFWA) Sage-grouse Management Zones (Stiver et al. 2006) covered by the planning efforts; by BLM Priority Habitat and General Habitat; and by Priority Areas for Conservation (PACs) as defined in the sage-

grouse Conservation Objectives Team (COT) Report (US Fish and Wildlife Service 2013). Funding support and dedicated personnel for broad- and mid-scale monitoring will be renewed annually through the normal budget process.

Sage-grouse are a landscape species, and conservation is a scale-dependent process whereby priority landscapes are identified across the species range and appropriate conservation actions are implemented within seasonal habitats to benefit populations. Following guidelines established by multiple agencies in the Sage-grouse Habitat Assessment Framework (HAF; Stiver et al. 2010), this approach uses the four orders of sage-grouse habitat selection (Johnson 1980): first order (broad scale), second order (mid scale), third order (fine scale), and fourth order (site scale). Because RMP decisions are made largely at the broad and mid scale, this draft monitoring framework focuses on these two larger spatial scales. The need for fine- and site-scale habitat monitoring may vary by area depending on existing conditions, habitat variability, threats, and land health; however indicators at these scales will be consistent with the HAF. Thus, this draft monitoring framework includes methods, data standards, and intervals of monitoring at the broad and mid scales, while outlining indicators to be measured at all scales.

## **BROAD AND MID SCALES**

First order habitat selection at the broad scale describes the selection of physical or geographical range of a species. There is one first order habitat, the range of the species defined by populations of sage-grouse associated with sagebrush landscapes (Schroeder et al. 2004; Connelly et al. 2004). Additionally, there is an intermediate scale between the broad and mid scales that was delineated from floristic provinces within which similar environmental factors influence vegetation communities. This scale was developed by WAFWA and is referred to as the WAFWA Sage-grouse Management Zones.

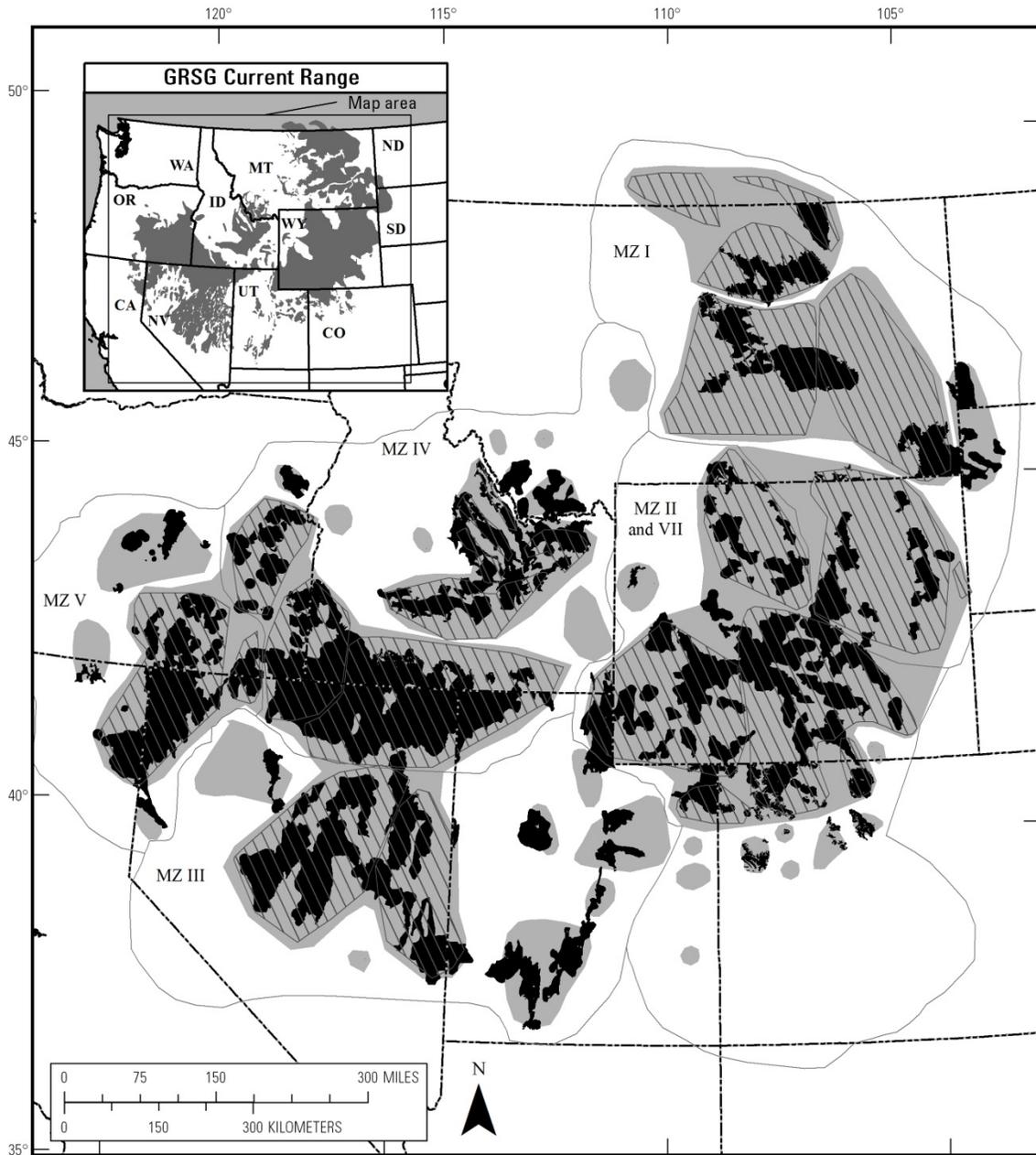
Second order habitat selection at the mid-scale includes sage-grouse populations, subpopulations, and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Subpopulations range in area from 300 to 22,400 square miles, while populations range in area from 150 to 54,600 square miles. PACs range from 20 to 20,400 square miles.

Broad- and mid-scale monitoring results will be reported at the appropriate and applicable geographic scale (**Table B-1**, Indicators for Monitoring Implementation of Decisions, Sage-grouse Habitat, and Sage-grouse Populations at the Broad and Mid Scales, and **Diagram B-1**, GRSG Priority Areas for Conservation, Subpopulations, and Populations).

**Table B-1**  
**Indicators for Monitoring Implementation of Decisions, Sage-grouse Habitat, and Sage-grouse Populations at the Broad and Mid Scales**

<b>Geographic Scales</b>	<b>Implementation</b>	<b>Habitat</b>		<b>Population (States)</b>
	<b>Decisions</b>	<b>Disturbance</b>	<b>Vegetation</b>	<b>Demographics</b>
Broad Scale: From the range of sage-grouse to WAFWA Management Zones	RMP objectives, thresholds, and management actions	Distribution of sagebrush within occupied habitat		WAFWA Management Zone population level and population trends
Mid-Scale: From WAFWA Management Zone scale to subpopulation/ Priority Area for Conservation scale	RMP decisions, vegetation/ mid-scale decisions	Percent of sagebrush per unit area, anthropogenic footprint, density of energy development	Sagebrush patch characteristics, sage-grouse habitat indicators	Subpopulation scale, dispersal, and lek complex trends

**Diagram B-I. GRSG Priority Areas for Conservation, Subpopulations, and Populations**



**GRSG PACs, Subpopulations and Populations**

**LEGEND**

-  Subpopulations
-  COT PACs
-  Populations

**Sources:**  
 Current Range: Schroeder et al., 2004  
 Populations: Connelly et al., 2004  
 Subpopulations: Connelly et al., 2004  
 PACs: USFWS COT Report, 2013

### **Implementation (Decision) Monitoring**

The regulations for the BLM (43 CFR 1610.4-9) require that RMPs establish intervals and standards for monitoring and evaluations, based on the sensitivity of the resource decisions involved. Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of land use plan decisions. A Lewistown Field Office Greater Sage-Grouse Implementation Workbook will be completed within one year of the Record of Decision to track the number and type of applicable implementation actions related to each decision for each resource program, and maintained as actions occur. The BLM will be documenting progress annually toward full implementation of the RMP.

### **Habitat (Vegetation) Monitoring**

The current geographic extent of sagebrush vegetation within the rangewide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2006). LANDFIRE EVT was selected to serve as the base sagebrush layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated since 2001; 2) the ecological systems classification includes multiple sagebrush type classes that, when aggregated, provide more accurate (compared to individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a vigorous spatial accuracy assessment from which to derive the rangewide uncertainty of the base map 4) LANDFIRE EVT can be compared against the geographic extent of land that has the capability to support sagebrush vegetation using LANDFIRE Biophysical Setting (BpS) to provide a reference point for understanding how much sagebrush can be supported in a defined geographic area, and 5) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al, 2011, Leu and Hanser 2011, and Knick and Hanser 2011). Therefore, BLM has determined that LANDFIRE provides the best available data at broad and mid scales to serve as an initial base layer for monitoring habitat characteristics and by which disturbance changes are measured, incorporated, and reported. Along with the aggregated sagebrush base map, BLM will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for our final base map. Looking at the long-term, BLM through its AIM program and specifically the Landscape Monitoring Framework will provide field data to the LANDFIRE program to support overall accuracy improvements in their products.

Within isolated areas, 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 products are useful below the mid scale for establishing baseline conditions for monitoring. The fact that they are not available everywhere however limits their utility for monitoring at the broad and mid scale where consistency of data products is necessary regardless of land ownership.

The BLM is improving the quality of vegetation map products for broad and mid scale analyses through the Grass/Shrub mapping effort in partnership with the Multi-Resolution Land Characteristics Consortium (MRLC). The Grass/Shrub mapping effort applies the Homer et al. (2009) methodology to spatially depict fractional percent cover estimates for four components range and west-wide. These four components are the percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), and percent shrubs. One of the benefits of the design of these fractional cover maps is that they facilitate monitoring “with-in” class variation. This “with-in” class variation can serve as one indicator of sagebrush quality that we cannot derive from vegetation type information from LANDFIRE.

The base sagebrush layer, whether derived from LANDFIRE or Grass/Shrub, will allow for estimation of mid-scale indicators, e.g. patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. 2010). The actual methods used to calculate these metric will be derived from existing literature (Knick et al, 2011, Leu and Hanser 2011, and Knick and Hanser 2011). Disturbance updates, generated annually, will be included into the base layer and the landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. The appropriate geographic boundaries for this base layer include the range, management zone, population, subpopulation, and PAC. Other data sources would need to be used to report landscape metrics any finer than the PAC.

The sagebrush base layer and disturbance data provide the ability to calculate landscape metrics as one element of habitat monitoring at the broad and mid scales. Habitat quality, however, will be monitored using field data collected with a statistically valid sampling design (e.g., Landscape Monitoring Framework, a collaborative effort with NRCS on BLM-administered lands (USDI-BLM 2011); AIM monitoring data (Toevs et al. 2011); and see "II. Fine and Site Scales"). These efforts can quantify indices such as percent annual grasses, species composition, sagebrush height, and bare ground at the PAC scale with known error estimates that are continually reduced as more data are collected. Point data will also be used to enhance the accuracy and precision of the Shrub/Grass mapping product. This product can in turn provide additional information about habitat quality at the mid scale. Long term, BLM will be able to provide a suite of monitoring metrics for the PACs and larger scales that will provide a comprehensive view of sagebrush and sage-grouse habitat condition when combined with population data supplied by the states.

### **Habitat (Disturbance) Monitoring**

Most of the decisions in this RMP are in response to “Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range” in the U.S. Fish and Wildlife Service’s (USFWS’s) 2010 listing decision for sage-grouse (75 FR 13910 2010). The USFWS identified several “threats” affecting Factor A; therefore, the BLM will monitor the relative extent of these threats

on sagebrush, both spatially and temporally, to report on conditions at the appropriate and applicable geographic scales and boundaries.

Disturbance data will include:

1. Agriculture
2. Urbanization
3. Habitat treatments
4. Wildfire
5. Invasive plants
6. Conifer encroachment
7. Energy (oil and gas wells and development facilities)
8. Energy (coal mines)
9. Energy (wind towers)
10. Energy (solar fields)
11. Energy (geothermal)
12. Mining (active developments; locatable, leasable, salable)
13. Infrastructure (roads)
14. Infrastructure (railroads)
15. Infrastructure (power lines)
16. Infrastructure (communication towers)
17. Infrastructure (other vertical structures)
18. Other developed right-of-ways

Cumulative disturbance monitoring will aggregate these 18 threats into the following three general measures (see **Attachment A**, Geospatial data layers used to determine three factors for greater sage-grouse habitat disturbance monitoring at the broad and mid scales):

1. Percent of sagebrush per unit area
2. Percent of non-habitat (human footprint) per unit area
3. Number of energy facilities and mining locations per unit area (density)

To accomplish disturbance monitoring, the BLM will begin with a base layer of sagebrush described previously in Habitat (Vegetation) Monitoring. Restored areas will also be considered when evaluating the percentage of sagebrush on the landscape.

Next, the BLM will use the best available rangewide data (external and/or internal data) to evaluate anthropogenic and natural disturbances (direct physical footprint) of sage-grouse habitat based on threats listed in Factor A. The Sage-Grouse Baseline Environmental Report (BER; Manier et al. 2013) essentially provided a baseline collection of datasets across jurisdictions where available, however for some threats, the data were for federal lands only. Most of the data used in the BER were from external data sources; therefore, the BLM will use the most currently available versions to evaluate changes (additional footprints) from the baseline dataset. A subset of these data (e.g. fire perimeters, mine and energy sites), provided by BLM field and state offices will be updated and reported to agency headquarters annually. The BLM will report the change in footprints for each of the 18 threats as well as cumulatively for the three general measures described previously.

### **Population (Demographics) Monitoring**

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. The BLM has initiated a process to establish that WAFWA will coordinate collection of annual population data by state agencies. To establish certainty that the data will be provided to the BLM, the existing memorandum of understanding signed by WAFWA, the BLM, the Natural Resources Conservation Service, and the USFWS ([http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning\\_and\\_Renewable\\_Resources/fish\\_wildlife\\_and/sage-grouse.Par.6386.File.dat/MOU%20on%20Greater%20Sage-Grouse.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/fish_wildlife_and/sage-grouse.Par.6386.File.dat/MOU%20on%20Greater%20Sage-Grouse.pdf)) could be revised to outline collaboration, process, and responsibilities for data analysis and transfer related to management of sage-grouse. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions.

### **Effectiveness Monitoring**

The BLM will analyze the monitoring data to characterize the relationship among the disturbance, implementation actions, and habitat condition at the appropriate and applicable geographic scale or boundary to accomplish effectiveness monitoring for the Lewistown Field Office Greater Sage-Grouse RMPA. This will involve evaluating the change in habitat conditions from the baseline conditions in relation to the goals and objectives of the plan and other rangewide conservation strategies (US Department of the Interior 2004; Stiver et al. 2006; US Fish and Wildlife Service 2013). When available from WAFWA and/or state wildlife agencies, effectiveness monitoring can be supplemented with population trends (taking into consideration the lag effect response of populations to habitat changes [Garton et al. 2011]). The compilation of broad and mid-scale data (and population trends as available) will be on a five-year reporting schedule or as needed to respond to emerging issues. In addition, effectiveness monitoring will be used to identify emerging issues and research needs and will be consistent with and inform the BLM adaptive management strategy (see **Chapter 2, Section 2.7**, Adaptive Management).

## **FINE AND SITE SCALES**

Third order habitat selection at the fine scale describes the physical and geographic area within home ranges. At this level, maps of seasonal habitats (breeding, summer, and winter) and the connectivity between these seasonal use areas can be examined to determine limiting factors for populations, subpopulations, and PACs.

Fourth order habitat selection at the site scale is based on physical conditions and the geographic area within seasonal ranges to meet life requisite needs (e.g., nesting and brood rearing). Specific habitat measures are used at this scale as microsite conditions within the seasonal range to determine distribution and use. These measures are typically sampled across a defined area to inform third order habitat selection.

Details and application of monitoring at these two scales will be determined during implementation of the Lewistown Field Office Greater Sage-Grouse RMPA. 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. For example, implementation monitoring will track decisions in priority habitat; habitat vegetation monitoring will be conducted to evaluate projects targeting sage-grouse habitat enhancement and/or restoration; habitat disturbance monitoring will be conducted where mid-scale monitoring indicates the need for fine-scaled anthropogenic disturbance footprints; and population monitoring (in cooperation with state wildlife agencies) will be analyzed below the subpopulation/PAC level where needed for more specific effectiveness monitoring (some RMP objectives, activity plans, development plans, leasing plans, etc.).

Habitat indicator data collected at the fine- and site-scales will be consistent with the HAF and information provided in the sage-grouse guidelines (Connelly et al. 2000) as well as the core indicators in the assessment, inventory and monitoring (AIM) strategy (Toevs et al. 2011). However the metrics for quantifying the indicators can be adjusted for local conditions. If local adjustments to metrics are made, the adjustments will be appropriate to the floristic province/sage-grouse management zone where the data were collected and reflect local plant productivity and sage-grouse habitat data collected within the area. In short, adjustments will be science-based (i.e., predicated on data collected locally and published in a peer-review outlet) and ecologically defensible (i.e., generally supported by the broad base of knowledge on sagebrush and sage-grouse provided in the peer-review literature). When evaluating the land health habitat standard in designated sage-grouse habitats, the BLM will analyze core indicators and other supplemental site scale sage-grouse habitat indicators (see HAF) as appropriate for the seasonal habitat. The activity level plans will describe a sampling scheme for collecting indicators with a non-biased sampling design for vegetation treatments or management actions implemented at the site scale. In addition, the consistent collection of these data

will be used to inform the classification and interpretation of imagery and habitat quality at the mid scale as described above.

For examples of current applications of disturbance and reclamation monitoring at the fine scale, see 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.

## FINAL MONITORING PLAN

This draft monitoring framework was developed for draft environmental impact statements to describe the proposed monitoring activities for this plan. The BLM will consider public comments and collaborate with other agencies to finalize the Lewistown Field Office Greater Sage-Grouse RMPA Sage-grouse Monitoring Plan.

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**ATTACHMENT A, GEOSPATIAL DATA LAYERS USED TO DETERMINE THREE FACTORS FOR GRSB HABITAT DISTURBANCE MONITORING AT THE BROAD AND MID SCALES**

<b>Geospatial Data Layer</b>	<b>Percent of Sagebrush</b>	<b>Percent of Non-habitat (Human Footprint)</b>	<b>Number of Energy and Mining Facilities</b>
Sagebrush	X		
Areas with biotic potential for sagebrush	X		
Agriculture	X		
Urbanization	X		
Habitat treatments	X		
Wildfire	X		
Invasive plants	X		
Conifer encroachment	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	
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	

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# Appendix C

Required Design Features and Best Management  
Practices for Greater Sage-Grouse Habitat for  
Alternatives B and C



# APPENDIX C

## REQUIRED DESIGN FEATURES AND BEST MANAGEMENT PRACTICES FOR GREATER SAGE-GROUSE HABITAT FOR ALTERNATIVES B AND C

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### INTRODUCTION

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

**Best Management Practices (BMPs)** are a suite of techniques that guide or may be applied to management actions to aide in achieving desired outcomes. BMPs are continuously improving as new science and technology become available and therefore are subject to change.

**Alternatives Summary:** There are no RDFs in the current Judith Resource Area and Headwaters Resource Management Plans (RMPs); therefore, Alternative A does not have any RDFs. The RDFs listed below apply where applicable and appropriate for Alternatives B and C in the Lewistown Field Office Greater Sage-Grouse RMP Amendment/Environmental Impact Statement.

## ALTERNATIVES B AND C REQUIRED DESIGN FEATURES

### Required Design Features for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty (2007))

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer *Culex* mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.

7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

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### **REQUIRED DESIGN FEATURES FOR FLUID MINERAL DEVELOPMENT**

#### **RDFs for Priority Sage-Grouse Habitat in Alternative B and All Sage-Grouse Habitat in Alternative C**

##### **Roads**

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among rights-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.

### **Operations**

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of 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 sage-grouse.

- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g. by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. *In preparation*).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.

- Locate new compressor stations outside priority habitats (PH) and design them to reduce noise that may be directed towards PH.
- Clean up refuse.
- Locate man camps outside of PH.

#### **Reclamation**

- Include objectives for ensuring habitat restoration to meet sage-grouse 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 sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

#### **Literature Cited**

- Blickley, J.L., D. Blackwood, and G.L. Patricelli. In preparation. Experimental evidence for avoidance of chronic anthropogenic noise by greater sage-grouse. University of California-Davis, California, USA.
- Bui, T.D., J.M. Marzluff, and B. Bedrosian. 2010. Common raven activity in relation to land use in western Wyoming: implications for greater sage-grouse reproductive success. *Condor* 112:65-78.
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Pyke, D.A. 2011. Restoring and rehabilitating sagebrush habitats. Pp. 531-548 in S.T. Knick and J.W. Connelly (editors). *Greater sage-grouse: ecology and conservation of a landscape species and its habitats*. *Studies in Avian Biology* 38. University of California Press. Berkeley, CA.

## **REQUIRED DESIGN FEATURES FOR FIRE & FUELS MANAGEMENT**

### **RDFs for Priority Sage-Grouse Habitat in Alternative B and All Sage-Grouse Habitat in Alternative C**

#### ***Fuels Management***

1. Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
3. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
4. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to National Environmental Policy Act and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner that promotes use by sage-grouse.
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.

8. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display current fuels treatment opportunities for suppression resources.
9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by PH or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to PH, but within two miles of PH. The third priority for annual grassland habitat restoration projects are sites beyond two miles of PH. The intent is to focus restoration outward from existing, intact habitat.
10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PH or important restoration areas (such as where investments in restoration have already been made).

#### **Fire Operations**

1. Compile district-level information into state-wide sage-grouse tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each district, which will be aggregated into a state-wide document.

2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
3. Assign a resource advisor with sage-grouse expertise, or who has access to sage-grouse expertise, to all extended attack fires in or near sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse 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 sage-grouse habitat areas.
5. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.
6. During periods of multiple fires, ensure line officers are involved in setting priorities.
7. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
8. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
9. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
10. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
11. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
12. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
13. Adequately document fire operation activities in sage-grouse habitat for potential follow-up coordination activities.

## **ALTERNATIVES B AND C SOLID MINERAL DEVELOPMENT – REQUIRED DESIGN FEATURES AND BEST MANAGEMENT PRACTICES**

### **Introduction**

The following measures outlined would be applied as RDFs for solid minerals, except locatable minerals. The measures outlined below would be applied as recommended BMPs for locatable minerals. The RDFs or BMPs would be applied as appropriate in PH and GH, and to the extent allowable by law (i.e., to prevent unnecessary and undue degradation). For example, Alternative B proposes to withdraw PH from locatable mineral entry; therefore, these measures would not be relevant to PH, but would apply to GH. Alternative C proposes to withdraw locatable minerals from both PH and GH; therefore, these measures would not be necessary.

### **Roads**

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

### **Operations**

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.

- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Require sage-grouse-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of PH.

#### **Reclamation**

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.

- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

#### **Literature Cited**

- Bergquist, E., P. Evangelista, T. J. Stohlgren, and N. Alley. 2007. Invasive species and coal bed methane development in the Powder River Basin, Wyoming. *Environmental Monitoring and Assessment* 128:381-394.
- Bui, T.D., J.M. Marzluff, and B. Bedrosian. 2010. Common raven activity in relation to land use in western Wyoming: implications for greater sage-grouse reproductive success. *Condor* 112:65-78.
- Doherty, M.K. 2007. Mosquito populations in the Powder River Basin, Wyoming: a comparison of natural, agricultural and effluent coal bed natural gas aquatic habitats. Thesis. Montana State University, Bozeman, U.S.A.
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# Appendix D

Required Design Features and Best Management  
Practices for Greater Sage-Grouse Habitat for  
Alternative D



# APPENDIX D

## REQUIRED DESIGN FEATURES AND BEST MANAGEMENT PRACTICES FOR GREATER SAGE-GROUSE HABITAT FOR ALTERNATIVE D

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### INTRODUCTION

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

**Best Management Practices (BMPs)** are a suite of techniques that guide or may be applied to management actions to aide in achieving desired outcomes. BMPs are continuously improving as new science and technology become available and therefore are subject to change.

**Alternatives Summary:** There are no RDFs in the current Judith Resource Area and Headwaters Resource Management Plans (RMPs); therefore, Alternative A does not have any RDFs. The RDFs listed below apply where applicable and appropriate for Alternative D, in the Lewistown Field Office Greater Sage-Grouse RMP Amendment/Environmental Impact Statement.

## **ALTERNATIVE D REQUIRED DESIGN FEATURES**

### **Required Design Features for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty (2007))**

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer *Culex* mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.

7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

### Literature Cited

- De Szalay, F.A. and V.H. Resh. 2000. Factors influencing macroinvertebrate colonization of seasonal wetlands: responses to emergent plant cover. *Freshwater Biology*. 45: 295-308.
- Doherty, M.K. 2007. Mosquito populations in the Powder River Basin, Wyoming: a comparison of natural, agricultural and effluent coal bed natural gas aquatic habitats. M.S. Thesis. Montana State University, Bozeman, U.S.A.
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- Schmidtman, E.T., R.J. Bobian, R.P. Beldin. 2000. Soil chemistries define aquatic habitats with immature populations of the *Culicoides variipennis* complex (Diptera: Ceratopogonidae). *Journal of Medical Entomology*. 37: 38-64.
- Walton, W.E., and P.D. Workman. 1998. Effect of marsh design on the abundance of mosquitoes in experimental constructed wetlands in Southern California. *Journal of the American mosquito control Association* 14:95-107.

## REQUIRED DESIGN FEATURES FOR FLUID MINERAL DEVELOPMENT IN PRIORITY AND GENERAL HABITAT

### Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among rights-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).

- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads, by restoring original landform and establishing desired vegetation.

### **Operations**

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of 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 sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.

- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g. by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. *In preparation*).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.
- Locate new compressor stations outside priority habitats (PH) and design them to reduce noise that may be directed towards PH.
- Clean up refuse.
- Locate man camps outside of PH.

- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.

### **Reclamation**

- Include objectives for ensuring habitat restoration to meet sage-grouse 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 sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

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## **REQUIRED DESIGN FEATURES FOR FIRE & FUELS MANAGEMENT IN PRIORITY HABITAT**

### ***Fuels Management***

1. Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
3. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
4. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to National Environmental Policy Act and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner that promotes use by sage-grouse.
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.
8. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display current fuels treatment opportunities for suppression resources.

9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by PH or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to PH, but within two miles of PH. The third priority for annual grassland habitat restoration projects are sites beyond two miles of PH. The intent is to focus restoration outward from existing, intact habitat.
10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PH or important restoration areas (such as where investments in restoration have already been made).

### **Fire Operations**

1. Compile district-level information into state-wide sage-grouse tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each district, which will be aggregated into a state-wide document.
2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
3. Assign a resource advisor with sage-grouse expertise, or who has access to sage-grouse expertise, to all extended attack fires in or

near sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse 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 sage-grouse habitat areas.
5. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.
6. During periods of multiple fires, ensure line officers are involved in setting priorities.
7. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
8. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
9. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
10. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
11. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
12. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
13. Adequately document fire operation activities in sage-grouse habitat for potential follow-up coordination activities.

## **ALTERNATIVES D SOLID MINERAL DEVELOPMENT – REQUIRED DESIGN FEATURES AND BEST MANAGEMENT PRACTICES**

### **Introduction**

The following measures outlined would be applied as RDFs for solid minerals, except for locatable minerals. The measures outlined below would be applied as recommended BMPs for locatable minerals. The RDFs and BMPs would be

applied as appropriate in PH and GH, and to the extent allowable by law (i.e., to prevent unnecessary and undue degradation).

### **Roads**

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

### **Operations**

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.

- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Require sage-grouse-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of PH.

### **Reclamation**

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

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### **ADDITIONAL SOLID MINERAL DEVELOPMENT RDFs AND BMPS TO BE IMPLEMENTED**

- Recommend minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on greater sage-grouse habitats. Apply these measures during activity level planning.
- Encourage development in incremental stages to stagger disturbance; design schedules that include long-term strategies to localize disturbance and recovery within established zones over a staggered timeframe.
- Use off-site mitigation or purchase conservation easements with industry dollars to offset habitat losses.
- Remove facilities and infrastructure when use is completed.
- Allow no surface use in nesting habitat from March 1 through June 15.
- Restrict maintenance and related activities in Greater Sage-Grouse breeding/nesting complexes – March 1 through June 15 – between the hours of 4:00 – 8:00 a.m. and 7:00 – 10:00 p.m.
- Allow no surface use activities within Greater Sage-Grouse wintering areas from December 1 through March 31.
- Use minimal surface disturbance to install roads and pipelines and reclaim site of abandoned wells to natural communities.
- Locate storage facilities, generators, and holding tanks outside the line of sight and sound of breeding habitat.
- See conservation actions related to preventing the spread of weeds and controlling infestations of noxious weeds.

- Engage industry as a partner to develop and establish new sources of seed of native plant species for restoration of sites disturbed by development.
- Design impoundments and manage discharge so as not to degrade or inundate leks, nesting sites, and wintering sites.
- Protect natural springs from any source of disturbance or degradation from energy-related activities.
- Provide for long-term monitoring of siting requirements to examine effects of current and future development on sage-grouse.
- Set up a schedule for reviewing and revising siting and use criteria with industry.

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# Appendix E

Area of Critical Environmental Concern Evaluation  
of Relevance and Importance Criteria



# APPENDIX E

## AREA OF CRITICAL ENVIRONMENTAL CONCERN

### EVALUATION OF RELEVANCE AND IMPORTANCE

### CRITERIA

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Areas of Critical Environmental Concern (ACECs) are BLM-administered lands where special management attention is needed to protect important and relevant values. Special management attention refers to management prescriptions developed during preparation of a resource management plan (RMP) or RMP amendment (RMPA) expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP, including proposed actions deemed to be in conformance with the terms, conditions, and decisions of the RMP (BLM Manual 1613).

To be a potential ACEC, a nominated area must meet the criteria of relevance and importance as outlined in 43 CFR 1610.7-2 and BLM Manual 1613. If the relevance and importance criteria are met, an area must be identified as a potential ACEC and considered for designation and management in the resource planning process. Designation is based on whether or not a potential ACEC requires special management attention in the selected plan alternative.

An area meets the “**relevance**” criteria if it contains one or more of the following relevance values:

- A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).
- A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species or habitat essential for maintaining species diversity).

- A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities, which are terrestrial, aquatic, or riparian; or rare geological features).
- Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “**importance**” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

- More than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.
- Qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.
- Recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of the Federal Land Policy and Management Act (FLPMA).
- Qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.
- Poses a significant threat to human life and safety, or to property.

Because the importance criteria are subjective, it is essential to create common assumptions on how they are applied by the RMPA. The facts on the ground need to support the decisions made. BLM, working with Montana Fish, Wildlife, and Parks (MFWP), has developed preliminary priority habitat (PPH) maps, displaying habitat that has been identified as the most important to the long-term viability of the Greater Sage-Grouse (GRSG).

In response to the “Notice of Intent to Prepare Environmental Impact Statements To Incorporate Greater Sage-grouse Conservation Measures Into Land Use Plans and Land Management Plans” (76 Fed. Reg. 77008), the BLM received an ACEC nomination for GRSG that was considered in this planning process. This report presents the completed evaluation form for the nominated ACEC in the planning area (**Table E-1**, Greater Sage-Grouse Relevance and Importance Evaluation). An ACEC that meets both relevance and importance

**Table E-1  
Greater Sage-Grouse Relevance and Importance Evaluation**

<b>Area Considered:</b> Fergus and Petroleum Counties, Montana (counties within the Lewistown Field Office (LFO) that contain preliminary priority habitat [PPH])		
<b>General Location:</b> BLM-administered lands managed by the LFO in the north central portion of Montana		
<b>General Description:</b> Priority habitat areas for Greater Sage-Grouse (GRSG) with at least 4,000 acres of contiguous BLM surface ownership		
<b>Acreage:</b> 96,246 acres		
<b>Values Considered:</b> GRSG priority habitat		
<b>Relevance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate and are similar to those of many other areas in the planning area.
A fish and wildlife resource	Yes	The nomination meets the relevance criterion for wildlife resources. The nominated area provides habitat for GRSG, a BLM sensitive species, and the area has also been identified as PPH by Montana Fish, Wildlife and Parks (MFWP) and BLM.
A natural process or system	Yes	The nomination also meets the criterion for a natural system or process because of the condition of the sagebrush habitat in portions of the nomination area.
Natural hazards	No	No natural hazards are known.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
More than locally significant qualities	No	Although the area contains habitat for GRSG conservation as noted in the nomination material, the area is not significantly unique or more important than other habitat areas in this region. GRSG are distributed throughout the western United States. The portion of the distribution in Montana, Wyoming, North Dakota, South Dakota, Alberta, and Saskatchewan are designated as Western Association of Fish and Wildlife Agencies Management Zone I (Stiver et al. 2006).  While all of these areas are considered important to GRSG conservation, the areas are dispersed throughout the region and are not significantly unique to a specific region or planning unit. In addition, GRSG habitat in these core areas is owned by a number of different entities and habitat on BLM-administered lands is not distinct from habitat managed by other ownership.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	Yes	Satisfies national priority concerns.

**Table E-1  
Greater Sage-Grouse Relevance and Importance Evaluation**

Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

criteria is included in at least one management alternative analyzed in the RMPA/environmental impact statement. The attached map identifies the locations of the nominated ACEC.

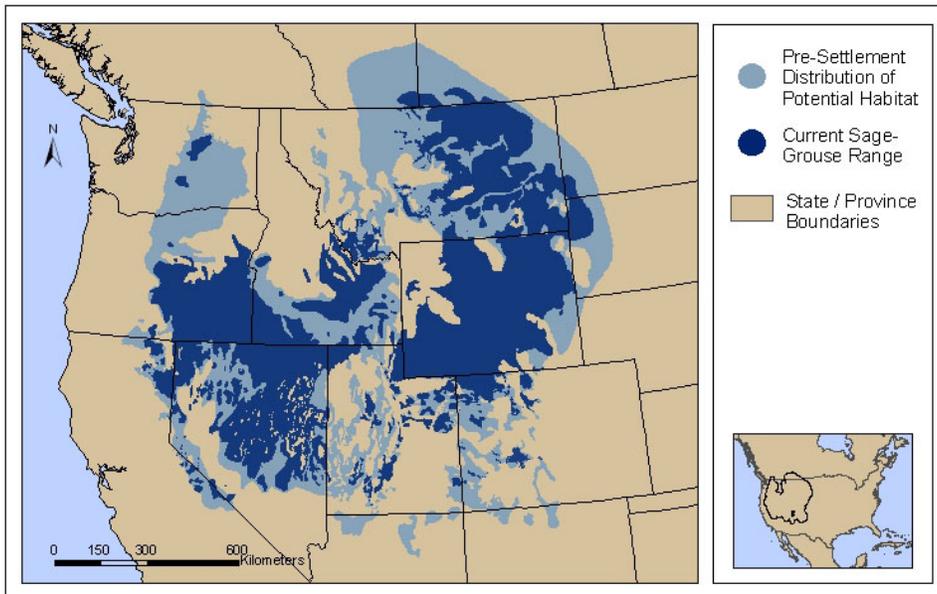
Whether a particular ACEC nomination meets the relevance and importance criteria depends on the specific facts of each area. GRSG conservation is a national priority, and PPH has been recognized as having the highest conservation value to maintaining sustainable populations. This appendix documents and substantiates how the ACEC nomination meets the existing relevance and importance criteria.

A finding that the ACEC nomination meets the relevance and importance criteria does not mean that it requires special management attention or will be designated as an ACEC. However, it does mean that the ACEC nomination will be carried forward for the development of management prescriptions in at least one alternative.

**BACKGROUND INFORMATION**

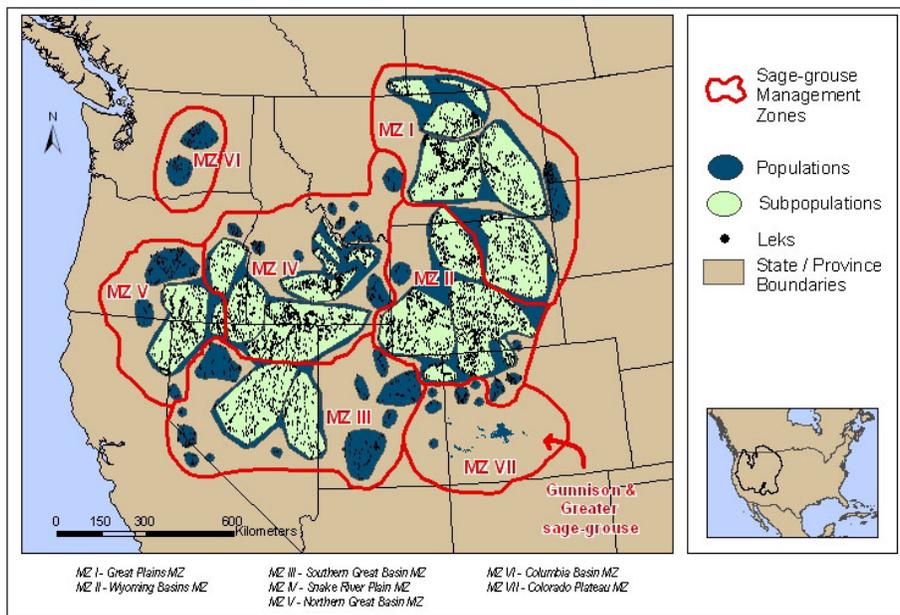
GRSG are distributed throughout the western United States (**Figure E-1, Greater Sage-Grouse Distribution**). The portion of the distribution within the planning area being considered for ACEC designations is located within Western Association of Fish and Wildlife Agencies Management Zone I (**Figure E-2, Greater Sage-Grouse Management Zones**) (Stiver, et al. 2006). Management Zone I includes all of Montana (except the Dillon Field Office), North Dakota, South Dakota, and northeastern Wyoming. Management zones are delineations of GRSG populations and sub-populations within floristic zones with similar management issues. Within Management Zone I in Montana, MFWP designated core areas (MFWP 2009). In addition, Montana Audubon has also designated five important bird areas for sage-steppe associated birds, including GRSG, in Montana, most of which are contained within the MFWP core areas.

**Figure E-1**  
**Greater Sage-Grouse Distribution**

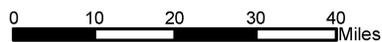
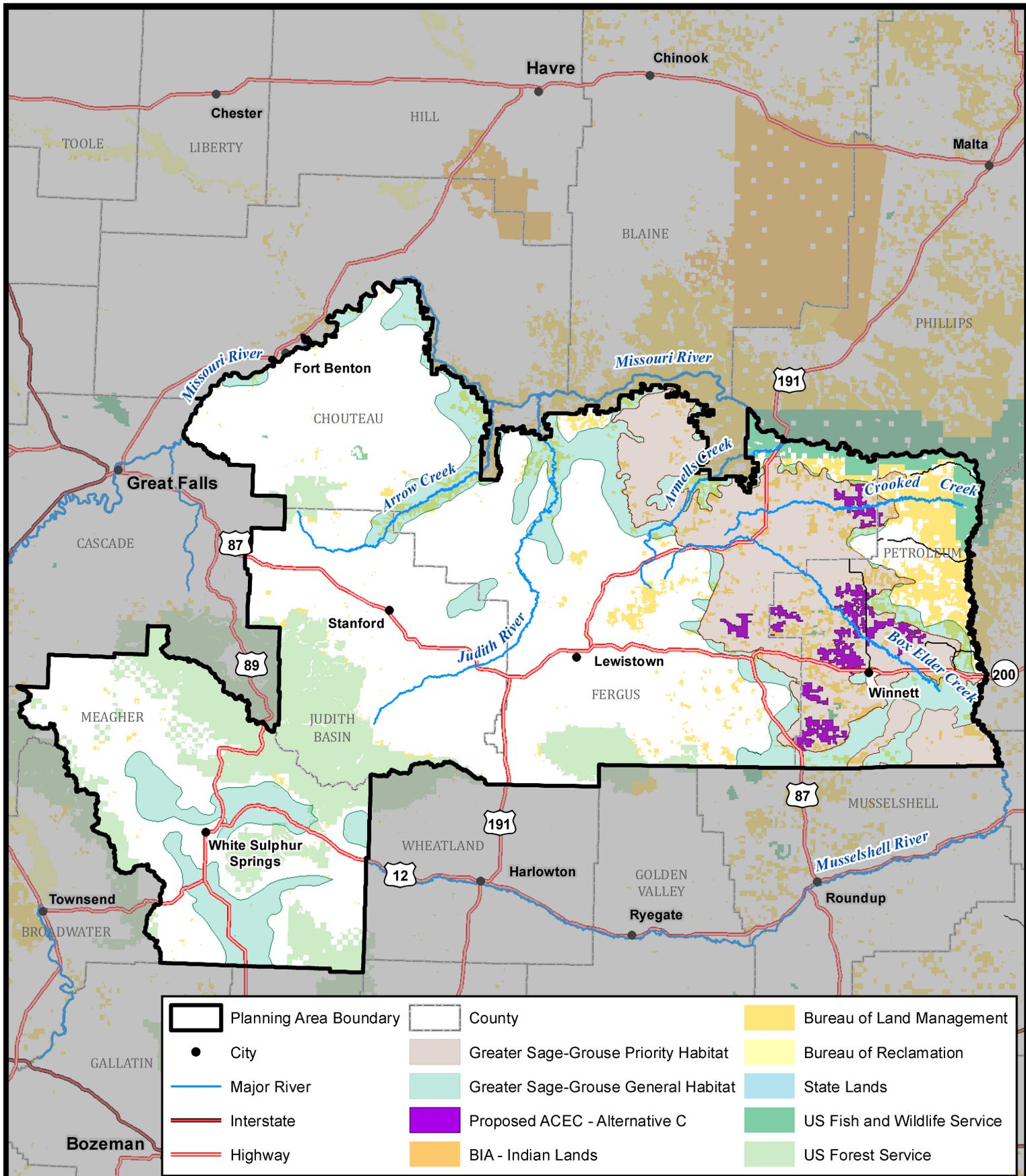


Source: Stiver, et al. 2006

**Figure E-2**  
**Greater Sage-Grouse Management Zones**



Source: Stiver, et al. 2006



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

# Area of Critical Environmental Concern - Alternative C

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# Appendix F

Standards for Rangeland Health and Guidelines for  
Livestock Grazing Management for Public Lands  
Administered by the Bureau of Land Management  
for Montana and the Dakotas



**Standards for Rangeland Health and Guidelines  
for Livestock Grazing Management  
for Public Lands Administered  
by the Bureau of Land Management  
for Montana and the Dakotas**

Note: These standards and guidelines apply to the Lewistown and Malta Field Offices

Standards

Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Achieving or making significant and measurable progress towards these functions and conditions is required of all uses of public rangelands. Historical data, when available, should be used when assessing progress towards these standards.

**Lewistown STANDARD #1: Uplands are in proper functioning condition.**

This means that soils are stable and provide for capture, storage and safe release of water appropriate to soil type, climate and landform. The amount and distribution of ground cover (i.e., litter, live and standing dead vegetation, microbiotic crusts, and rock/gravel) for identified ecological site(s) or soil-plant associations are appropriate for soil stability.

Evidence of accelerated erosion in the form of rills and/or gullies, erosional pedestals, flow patterns, physical soil crusts/surface scaling and compaction layers below the soil surface is minimal. Ecological processes including hydrologic cycle, nutrient cycle and energy flow are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential and there is a diversity of species characteristic of and appropriate to the site. Assessing proper functioning conditions will consider use of historical data.

- As indicated by

- Physical Environment

- erosional flow patterns;
    - surface litter;
    - soil movement by water and wind;
    - soil crusting and surface sealing;
    - compaction layer;
    - rills;
    - gullies;
    - cover amount; and
    - cover distribution.

- Biotic Environment

- community richness;
    - community structure;
    - exotic plants;
    - plant status;
    - seed production;
    - recruitment; and
    - nutrient cycle.

## **Lewistown STANDARD #2: Riparian and wetland areas are in proper functioning condition.**

This means that the functioning condition of riparian-wetland areas is a result of the interaction among geology, soil, water and vegetation. Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid flood plain development; improve flood water retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for native fish production, waterfowl breeding, and other uses appropriate for the area that will support greater species richness.

The riparian-wetland vegetation is a mosaic of species richness and community structure serving to control erosion, shade water, provide thermal protection, filter sediment, aid flood plain development, dissipate energy, delay flood water, and increase recharge of groundwater where appropriate to landform. The stream channels and flood plain dissipate energy of high waterflows and transport sediment appropriate for the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity), climate, and landform. Soils support appropriate riparian-wetland vegetation, allowing water movement, filtering sediment, and slowing ground water movement for later release. Stream channels are not entrenching beyond natural climatic variations and water levels maintain appropriate riparian-wetland species.

Riparian areas are defined as land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil. Assessing proper functioning conditions will consider use of historical data.

- As indicated by:

- Hydrologic

- flood plain inundated in relatively frequent events (1-3 years);
    - amount of altered streambanks;
    - sinuosity, width/depth ratio, and gradient are in-balance with the landscape setting (i.e., landform, geology, and bioclimatic region); and
    - upland watershed not contributing to riparian degradation.

- Erosion Deposition

- plain and channel characteristics; i.e., rocks, coarse and/or woody debris adequate to dissipate energy;
    - point bars are being created and older point bars are being vegetated;
    - lateral stream movement is associated with natural sinuosity;
    - system is vertically stable; and
    - stream is in balance with water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition).

- Vegetation

- reproduction and diverse age class of vegetation;
    - diverse composition of vegetation;
    - species present indicate maintenance of riparian soil moisture characteristics;
    - streambank vegetation is comprised of those plants or plant communities that have deep binding root masses capable of withstanding high streamflow events;
    - utilization of trees and shrubs;

- riparian plants exhibit high vigor;
- adequate vegetative cover present to protect banks and dissipate energy during high flows; and
- where appropriate, plant communities in the riparian area are an adequate source of woody debris.

**Lewistown STANDARD #3: Water quality meets Montana State standards.**

This means that surface and groundwater on public lands fully support designated beneficial uses described in the Montana Water Quality Standards. Assessing proper functioning conditions will consider use of historical data.

- As indicated by
  - dissolved oxygen concentration;
  - pH;
  - turbidity;
  - temperature;
  - fecal coliform;
  - sediment;
  - color;
  - toxins; and
  - others: ammonia, barium, boron, chlorides, chromium, cyanide, endosulfan, lindane, nitrates, phenols, phosphorus, sodium, sulfates, etc.

**Lewistown STANDARD #4: Air quality meets Montana State standards.**

This means that air quality on public lands helps meet the goals set out in the State of Montana Air Quality Implementation Plan. Efforts will be made to limit unnecessary emissions from existing and new point or nonpoint sources.

The BLM management actions or use authorizations do not contribute to air pollution that violates the quantitative or narrative Montana Air Quality Standards or contributes to deterioration of air quality in selected class area.

- As indicated by:
  - Section 176(c) Clean Air Act which states that activities of all federal agencies must conform to the intent of the appropriate State Air Quality Implementation Plan and not:
    - cause or contribute to any violations of ambient air quality standards;
    - increase the frequency of any existing violations; and
    - impede the State's progress in meeting their air quality goals.

**Lewistown STANDARD #5: Habitats are provided to maintain healthy, productive and diverse populations of native plant and animal species, including special status species (federally threatened, endangered, candidate or Montana species of special concern as defined in BLM Manual 6840, Special Status Species Management).**

This means that native plant and animal communities will be maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant lifeforms. Where native communities exist, the conversion to exotic communities after disturbance will be minimized. Management for indigenous vegetation and animals is a priority. Ecological processes including hydrologic cycle, and energy flow, and plant succession are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential, and there is a diversity of plant and animal species characteristic of and

appropriate to the site. The environment contains components necessary to support viable populations of a sensitive/threatened and endangered species in a given area relative to site potential. Viable populations are wildlife or plant populations that contain an adequate number of reproductive individuals distributed on the landscape to ensure the long-term existence of the species. Assessing proper functioning conditions will consider use of historical data.

- As indicated by:
  - plants and animals are diverse, vigorous and reproducing satisfactorily noxious weeds are absent or insignificant in the overall plant community;
  - spatial distribution of species is suitable to ensure reproductive capability and recovery;
  - a variety of age classes are present;
  - connectivity of habitat or presence of corridors prevents habitat fragmentation;
  - species richness (including plants, animals, insects and microbes) are represented; and
  - plant communities in a variety of successional stages are represented across the landscape.

### Grazing Management Guidelines

Guidelines for management of herbivory (including domestic animals and wildlife) are preferred or advisable approaches to ensure that standards can be met or that significant progress can be made toward meeting the standard(s). Responsible state and Federal wildlife agencies must be involved in this management if standards are to be achieved.

Guidelines are provided to maintain or improve resource conditions in upland and riparian habitats. In both riparian and upland habitats, these guidelines focus on establishing and maintaining proper functioning conditions. The application of these guidelines is dependent on individual management objectives. Desired future conditions in plant communities and streambank characteristics will be determined on a case-by-case basis.

#### **Lewistown GUIDELINE #1:**

Grazing will be managed in a manner that will maintain the proper balance between soils, water, and vegetation over time. This balance varies with location and management objectives, historic use, and natural fluctuations, but acceptable levels of use can be developed that are compatible with resource objectives.

#### **Lewistown GUIDELINE #2:**

Manage grazing to maintain watershed vegetation, species richness, and flood plain function. Maintain riparian vegetative cover and structure to trap and hold sediments during run-off events to build streambanks, recharge aquifers, and dissipate flood energy. Grazing management should promote deep-rooted herbaceous vegetation to enhance streambank stability. Where non-native species are contributing to proper functioning conditions, they are acceptable. Where potential for palatable woody shrub species (willows, dogwood, etc.) exists, promote their growth and expansion within riparian zones.

#### **Lewistown GUIDELINE #3:**

Pastures and allotments will be managed based on their sensitivity and suitability for livestock grazing. Where determinations have not been previously documented, suitability for grazing will be determined by: topography, slope, distance from water, vegetation habitat types, and soil types must be considered when determining grazing suitability. Unsuitable areas should be excluded from grazing.

**Lewistown GUIDELINE #4:**

Management strategies for livestock grazing will ensure that long-term resource capabilities can be sustained. End of season stubble heights, streambank moisture content, and utilization of herbaceous and woody vegetation are critical factors which must be evaluated in any grazing strategy. These considerations are essential to achieving long-term vegetation or stream channel objectives and should be identified on a site-specific basis and used as terms and conditions.

**Lewistown GUIDELINE #5:**

Grazing will be managed to promote desired plants and plant communities of various age classes, based on the rate and physiological conditions of plant growth. Management approaches will be identified on a site-specific basis and implemented through terms and conditions. Caution should be used to avoid early spring grazing use when soils and streambanks are wet and susceptible to compaction and physical damage that occurs with animal trampling. Likewise, late summer and fall treatments in woody shrub communities should be monitored closely to avoid excessive utilization.

**Lewistown GUIDELINE #6:**

The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect the ecological functions and processes of those sites.

**Lewistown GUIDELINE #7:**

Locate facilities (e.g., corrals, water developments) away from riparian-wetland areas.

**Lewistown GUIDELINE #8:**

When provided, supplemental salt and minerals should not be placed adjacent to watering locations or in riparian-wetland areas so not to adversely impact streambank stability, riparian vegetation, water quality, or other sensitive areas (i.e., key wildlife wintering areas). Salt and minerals should be placed in upland sites to draw livestock away from watering areas or other sensitive areas and to contribute to more uniform grazing distribution.

**Lewistown GUIDELINE #9:**

Noxious weed control is essential and should include: cooperative agreements, public education, and integrated pest management (mechanical, biological, chemical).

**Lewistown GUIDELINE #10:**

Livestock management should utilize practices such as those referenced by the NRCS published prescribed grazing technical guide to maintain, restore or enhance water quality.

**Lewistown GUIDELINE #11:**

Grazing management should maintain or improve habitat for federally listed threatened, endangered, and sensitive plant and animals.

**Lewistown GUIDELINE #12:**

Grazing management should maintain or promote the physical and biological conditions to sustain native populations and communities.

**Lewistown GUIDELINE #13:**

Grazing management should give priority to native species. Non-native plant species should only be used in those situations where native seed is not readily available in sufficient quantities, where native plant species cannot maintain or achieve the standards, or where non-native plant species provide an alternative for the management and protection of native rangelands.

**Lewistown GUIDELINE #14:**

Allotment monitoring determines how on-going management practices are affecting the rangeland. To do so, the evaluations should be based on: measurable management objectives; permanent and/or repeatable monitoring locations; and short-term and long-term data.

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# Appendix G

## Regional Mitigation Strategy



# APPENDIX G

## REGIONAL MITIGATION STRATEGY

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### INTRODUCTION

Mitigation strategies, which take into account the mitigation hierarchy (avoid, minimize, restore, offset), are an important tool for ensuring the US Bureau of Land Management (BLM) meet their Greater Sage-Grouse (GRSG) resource objectives while continuing to honor our multiple-use mission. The BLM priority is to mitigate impacts to an acceptable level onsite, to the extent practical, through avoidance (not taking a certain action or parts of an action), minimization (limiting the degree or magnitude of the action and its implementation), rectification (repairing, rehabilitating, or restoring the affected environment), or reduction of impacts over time (preservation and maintenance operations during the life of the action). While mitigating impacts for proposed projects to an acceptable level onsite is typically analyzed and determined through site-specific, implementation-level National Environmental Policy Act documents and their commensurate decision documents, the analysis and mitigation for project level activities would be tiered to the analysis and mitigation proposed throughout each of the action alternatives in this Resource Management Plan (RMP) amendment.

For those impacts that cannot be sufficiently avoided or minimized onsite, the BLM must ensure implementation of effective measures to offset (or compensate for) such impacts and to maintain or improve the viability of GRSG habitat and populations over time, as described in the US Fish and Wildlife Service (USFWS) Conservation Objectives Team Report. Regional mitigation may be a necessary component for many large renewable and nonrenewable energy development projects as well as many smaller projects with cumulative effects on the GRSG and its habitat.

Any regional mitigation strategy for BLM-administered lands would comply with BLM's Regional Mitigation Manual Section (MS) 1794, which provides policies, procedures, and instructions for:

1. Adopting a regional approach to planning and implementing mitigation, including pre identifying potential mitigation sites, projects, and measures; and
2. Identifying the type of mitigation that is needed to compensate for impacts to resources or values caused by a land use authorization.

It is important to note that any mitigation strategy must include the cooperation and coordination of appropriate and pertinent federal, state and local land and resource management agencies across the landscape. The final strategy adopted and implemented within a landscape would be dependent on the unique resources and values of the regional landscape and the mitigation strategies and resources contributed by the regional partners. It is important to acknowledge that the Montana Fish, Wildlife, and Parks (MFWP) working with the BLM as a cooperating agency on this RMP amendment may have already completed, or is currently working on, statewide mitigation strategies. The BLM would continue to work with and support those MFWP efforts.

The BLM would establish a Mitigation Implementation Team for each of the six Western Association of Fish and Wildlife Agencies (WAFWA) management zones in the West, following the completion of each of the 15 sub-regional environmental impact statements (EIS) that are associated with the National Greater Sage-Grouse Planning Strategy. The planning area presented in this sub-regional EIS lies within WAFWA Management Zones I and IV. The teams are responsible for developing a Mitigation Strategy consistent with BLM MS 1794, as appropriate. The teams would coordinate recommended mitigation strategies between RMP planning areas, WAFWA management zones, and local and state jurisdictions for mitigation consistency, where appropriate.

These implementation teams would be responsible for implementing BLM MS 1794, and making recommendations regarding the following items related to compensatory mitigation:

1. A structure for determining appropriate mitigation, including impact (debit) and benefit (credit) calculation methods, mitigation ratios, mitigation “currency” (i.e., numbers of birds, acres, etc.), location, and performance standards options by considering local and regional, mitigation options;
2. How to resolve mitigation oriented discrepancies that arise within the WAFWA management zone or between zones;
3. The application and the holding and disposition of any mitigation funds;
4. The most appropriate mitigation for impacts from a given land use authorization and type of seasonal habitat impacted;

5. Prioritization of potential mitigation sites, projects, and measures, as guided by conservation strategies (e.g. Priority Areas of Conservation (PACs), priority habitat areas); and
6. Reviewing mitigation monitoring reports and analyzing and reporting on project effectiveness, corrective measures/adaptive management (where required), and cumulative effects of mitigation actions at the PAC and the WAFWA management zone.

These WAFWA management zone Implementation Teams would function as inter-disciplinary teams composed of BLM, US Forest Service, USFWS and state fish and game agencies. The Mitigation Implementation Team would make recommendations to the BLM Authorized Officer. If the recommendations are rejected for any reason, the Mitigation Implementation Team would be reconvened to develop additional recommendations.

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# Appendix H

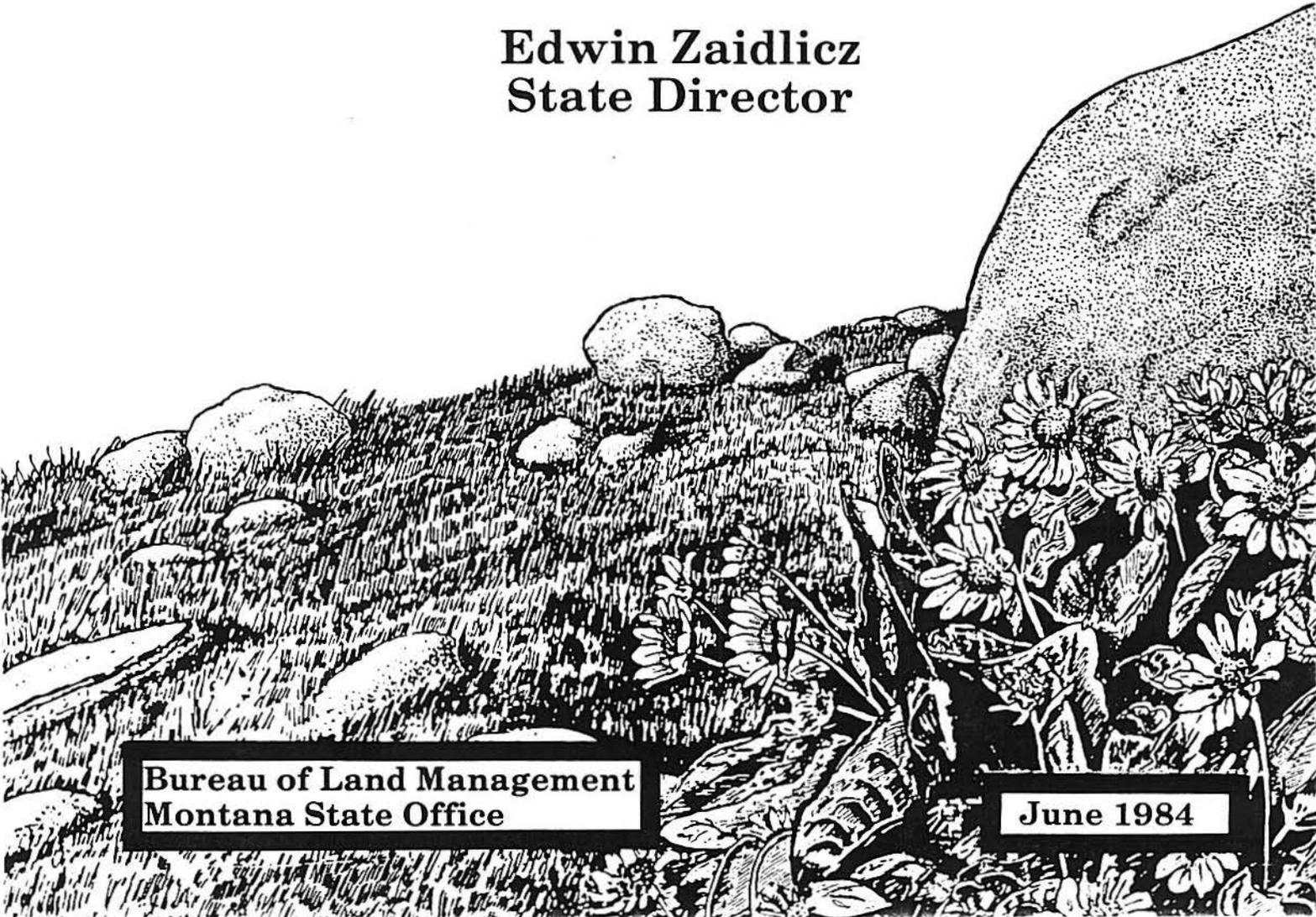
Land Pattern Review and Land Adjustment



# LAND PATTERN REVIEW AND LAND ADJUSTMENT

Supplement to State Director  
Guidance for Resource Management  
Planning in Montana and the Dakotas

Edwin Zaidlicz  
State Director



Bureau of Land Management  
Montana State Office

June 1984

BLM-MT-PT-84-015-4111



## United States Department of the Interior

BUREAU OF LAND MANAGEMENT

222 North 32nd Street

P.O. Box 30157

Billings, Montana 59107

1601 (930)

June 8, 1984

Dear Reader:

This supplement to the "State Director Guidance for Resource Management Planning in Montana and the Dakotas" incorporates changes and corrections resulting from the public review of the March 1984 draft. The document updates and replaces the Land Adjustment portion of the April 1983 State Director Guidance.

The portions of the 1983 document replaced are as follows: on page B-1 beginning with the "Land Pattern Review and Adjustments" paragraph continuing to "Corridor Planning" on the middle of page B-6. Appendix 1 is deleted because this information has been revised and incorporated into the Supplement. The Recreation Program Guidance (pages H-1 through H-3) is replaced with minor revisions.

I appreciate the effort and concern of all who submitted comments on the draft. All comments were carefully considered and many of the suggestions have been incorporated.

Response to Comments Not Incorporated

Some comments urged greater emphasis on wildlife values in the planning for land adjustment, and to eliminate reference to economics, agricultural and community expansion interests. We believe the criteria as developed provide a balanced treatment of all resources and public interests. This is an objective we strive for as a multiple use agency, within the constraints established by the law and national policy.

Questions were raised regarding definition of several terms such as public interest and public values. These are general terms which we believe should not be rigidly defined in a broad scope guidance document. They take on specific meaning as land adjustments are considered and processed. At each step relevant laws, regulations, national policies and public involvement guide the Bureau in defining what decisions are in the public interest or which may reflect the highest public interest.

In response to a question raised about the program specific acquisition criteria, no priority is implied by the order of their listing.

Concern was expressed over the Bureau's evaluation of the resources involved in exchanges or other land adjustments. The information and

rationale for BLM land adjustments are always open to public scrutiny, and opportunity for formal comment or protest occurs at key points in the process (i.e., during land use planning and when a Notice of Realty Action is issued).

One commentor perceived differences between field offices in making land adjustment decisions. All such variation cannot be eliminated, but it is one of the purposes of this guidance to increase consistency across our three states. It also provides standards against which consistency can be measured.

More exchanges between the BLM and the US Forest Service were urged and we are open to these opportunities. We plan to act on these opportunities within priorities as they are established for the limited resources available for land adjustment.

In a similar vein we were urged to support three-way exchanges involving the state or other Federal agencies. Such actions are within the scope of the guidance as written. However, regardless of the agencies involved BLM will evaluate the lands to be disposed or acquired against the criteria in this document and the overall objective under the Federal Land Policy and Management Act that the bulk of the public lands be retained and managed for multiple use and sustained yield.

Finally, one commentor urged that an Environmental Impact Statement (EIS) be prepared on the Guidance Supplement. An EIS was not prepared for the following reasons: The document is guidance for preparation of land use plans and subsequent program management. A land use plan (Resource Management Plan) includes an EIS and a plan amendment requires an Environmental Assessment (EA) or possibly an EIS. Every specific land adjustment proposal requires its own EA and technical report on the land involved. Environmental impacts will be thoroughly examined, and, most appropriately, at the stages in case processing when the actions are tangible and meaningful analysis can be done.

#### Map Revisions

We have reprinted the South Dakota map because of several errors. There were minor errors on the Montana map and the North Dakota map which are addressed with the enclosed errata sheet.

Some commentors seemed concerned that the maps present final Bureau decisions. This is not the case; the maps are generalized graphic displays of long term goals and expectations for the Land Adjustment Program. As was explained in the document, exceptions will be made in both retention and non-retention zones as the adjustment process unfolds and more detailed information is acquired on specific land transactions.

It should not be assumed that lands outside a retention zone are automatically intended for disposal. For example, concern was expressed over some small BLM tracts at Big Lake in Yellowstone County. These lands are involved in a cooperative wildlife project and will be retained. The overriding issue is not the zone in which a tract of land is displayed but whether it meets criteria for retention or disposal. The zones provide insight into Bureau emphasis and the most probable type of adjustment action, but are not meant to be tract specific in most cases.

One comment requested widening the retention zone along the Yellowstone River between Glendive and Sidney. We believe that expanding this corridor might raise the issue of conflict with important agricultural development in this area. We intend to retain and acquire lands in this corridor which have wildlife and recreation values but which are not primarily valuable for agricultural use. We do not intend to pursue acquisitions in conflict with productive agriculture.

Finally, two larger retention areas were inadvertently omitted from the Montana map. These involve BLM lands on the upper Stillwater River in Stillwater County and land along the lower Missouri River extending to the North Dakota border. These areas are defined in more detail on the errata sheet and will be added to the map when next revised.

Sincerely yours,

A handwritten signature in cursive script that reads "Ed Zaidlicz". The signature is written in dark ink and is positioned above the typed name and title.

Ed Zaidlicz  
State Director

2 Enclosures

- Encl. 1 - Guidance Supplement
- Encl. 2 - South Dakota Map

# ERRATA

## Land Pattern Adjustment Maps

### Montana Map

*Roosevelt County* — Within T. 27 N., R. 59 E., an area of approximately 2,500 federally-owned acres should be mapped as a retention zone. Other lands north of the Missouri River which possess river access will also be considered for retention. The retention zone south of the Missouri in Richland County should also be extended eastward to the North Dakota state line. This includes the area in Townships 26 N. and 27 N.

*Stillwater County* — BLM administered land in the upper Stillwater drainage should be mapped as a retention zone. These lands are in Bad Canyon and south of Beehive. In total about 2,500 acres are involved and lie primarily in Township 4 S., R. 16 E.

### North Dakota Map

*Burleigh—Morton Counties* — A zone along the Missouri should be mapped for retention from the upper end of Oahe Reservoir northward approximately six miles.

*McKenzie County* — The retention zone on the lower Yellowstone is incorrectly placed on the east side of the river. This retention zone should include both sides of the Yellowstone and extended to its confluence with the Missouri.

# CONTENTS

## STATE DIRECTOR GUIDANCE LAND BASE ADJUSTMENT SUPPLEMENT

<b>Introduction</b> .....	1
<b>Scope of Program</b> .....	2
Goals and Objectives .....	3
<b>Map Basis and Interpretation</b> .....	3
Public Review .....	3
Planning .....	3
Map Interpretation .....	3
Retention Zones .....	3
Other Lands .....	3
<b>Land Pattern Review</b> .....	4
Land Adjustment Program Phases .....	4
Land Pattern Review and Adjustment Criteria .....	4
Retention .....	4
Disposal .....	5
Acquisition .....	6
General Criteria for Acquisition and Retention .....	6
Program Specific Acquisition Criteria .....	6
Minerals .....	6
Livestock Management .....	7
Timber Management .....	7
Recreation .....	7
Wilderness .....	7
Cultural Resources .....	7
Wildlife Habitat .....	8
<b>Map Analysis</b> .....	9
Retention Zones .....	9
Other Lands .....	9
Montana Map .....	9
South Dakota Map .....	9
North Dakota Map .....	10
<b>Land Adjustment Impacts</b> .....	11
Resource Impacts .....	11
Management and Access .....	11
Social and Economic Effects .....	11
<b>RECREATION PROGRAM GUIDANCE REVISIONS</b>	
<b>Recreation</b> .....	13
Kind of Ownership Actions We Will Table .....	13
Kinds of Opportunities on Which We Will Concentrate .....	13
Kinds and Levels of Development We Will Consider .....	14
Off-Road Vehicle Designations .....	14



# STATE DIRECTOR GUIDANCE

## LAND BASE ADJUSTMENT SUPPLEMENT

This supplement replaces the "Land Pattern Review and Land Adjustments" Section of the 1983 State Director Guidance beginning on page B-1 through midpage B-6 and including Appendix 1. In addition, pages H-1 through H-3 of the Recreation Program Guidance are revised and included with the Supplement.

### INTRODUCTION

A new era in public land management began with the enactment of the Federal Land Policy and Management Act (FLPMA) in 1976. Prior to FLPMA public land management policy emphasized custodial management pending disposal. FLPMA prescribed retention of the public lands, but also authorizes BLM to enter into land adjustments.

The 8.4 million acre public land pattern in Montana and the Dakotas is characteristically fragmented, and typically consists of lands left over after the most desirable areas were placed in private ownership. Some 2.5 million acres exist in a scattered pattern of relatively small tracts from 40 to 160 acres in size.

Additional large but fragmented areas of split mineral estate occur, particularly in eastern Montana and the Dakotas. Some of these areas are underlain by minable coal deposits and/or have oil and gas development potential. The remaining public lands occur in relatively large tracts but it is usually only coincidental when the BLM lands are in a pattern conducive to ease of management or optimum utilization of the resources.

Major types of land adjustment concerning the BLM in Montana and the Dakotas are:

- State Exchange
- Regular Private Exchange
- Multi-party Exchanges
- State Selection
- Mineral Exchanges
- Acquisition
- BLM/Forest Service Jurisdictional Transfers
- Withdrawals
- Community Expansion
- Public Sale

No particular priority is implied by this list other than state land adjustments will take precedence over private proposals.

The State Director Guidance issued in April 1983 included criteria for planning decisions involving exchanges, jurisdictional transfers, or land sales. This supplement integrates existing plans and categorizes lands to provide a framework for future planning. Using this framework and the 1983 State Director Guidance we have completed maps showing areas where public lands will generally be retained. Until such time as land use plans are amended or revised, these maps will serve as a guide for all land adjustments.

The land retention maps are presented as a general policy guide to aid the public and agency personnel in evaluating proposals for land transactions. They should be helpful in distinguishing between proposals worthy of more detailed evaluation and those which are not. These maps and the accompanying analysis provide an indication of the probable long term magnitude of land adjustment in Montana and the Dakotas. This guidance supplement also provides an opportunity to revise and clarify the criteria published in 1983 and for public review and comment on these revisions.

Tract-specific land adjustments must be based upon land use plan decisions followed by more detailed activity planning. Land exchanges will be based upon the voluntary offering by the owners of the land which BLM may acquire, and will involve exchange of appraised value for value. This does not mean that the same kind of values must be exchanged. Relative abundance of the resources involved and their place in agency and public priorities must be considered.

## **SCOPE OF THE PROGRAM**

Of the 8.4 million acres administered by BLM in Montana and the Dakotas, 7.3 million acres (87 percent) are classified within retention zones. Approximately 1.1 million acres (13 percent) lie outside these retention zones, and it is estimated that over the expected life of the program (7 to 10 years) roughly half of this acreage may be involved in some type of land adjustment.

A stable level of land adjustment actions over the life of the program is our objective, however, some year-to-year variation will occur. Long-term accomplishments will depend upon public response in offering suitable lands in exchange for BLM disposal tracts as well as the availability of budgets to carry through the necessary planning and implementation action. Other factors which may limit the level of adjustment actions include the presence of mining claims, sensitive resource values such as archeological sites, unique fish, wildlife and recreational values, and economic limitations on the capacity of some adjacent landowners to participate.

Land adjustment would be predominately through exchanges. A small acreage may be disposed of under the Recreation and Public Purposes Act and some acreage may be involved in boundary adjustments with the U.S. Forest Service. Based on experience to date, sales will be a very minor part of the total land transactions. Although exchange will predominate there could be some reduction in total federal ownership because many transactions will require that the BLM acreage be greater than the acreage acquired to equalize values.

## **Goals and Objectives**

The overall goal of the land adjustment program is a public land pattern which balances multiple resource values while at the same time brings about better manageability. No individual land adjustment will achieve all resource objectives listed in this document, but the cumulative effect of land adjustments should result in improved multiple use management. These adjustments will achieve better overall public usability, greater management efficiency, and optimum accomplishments for all resource interests.

The Bureau's adjustment decisions should be made after thorough analysis and study of land use potential and should achieve the following long term objectives:

1. Retain those public lands having significant public values; acquire (primarily by exchange) other lands which will contribute significantly to accomplishing public land management objectives.
2. Adjust the BLM land pattern to get the highest public value.
3. Land use planning and public review and participation will occur as required by FLPMA, NEPA, and other related legislation.
4. Identify and transfer those public lands which could attain a higher and better use in the private sector or if managed by another public agency.

# MAP BASIS AND INTERPRETATION

## Public Review

The land retention maps in this supplement were prepared using criteria published in the 1983 State Director Guidance. This guidance, and in particular the land review and adjustment criteria, received extensive inter-governmental and public review. In accordance with the majority of the comments received, the land adjustment program will emphasize exchanges.

## Planning

The land review criteria were applied in four recently completed land use plans. These are the Billings and Headwaters Resource Management Plans (RMPs) in Montana and the Southwest and McKenzie-Williams Management Framework Plans (MFPs) in North Dakota. RMPs are in progress in the Powder River, Garnet and South Dakota Resource Areas.

The maps in this supplement incorporate decisions made in the recently completed plans. In areas where plans are under way, the retention zones are preliminary and may be adjusted when the land use plans are completed. In other areas retention zones were developed by District interdisciplinary teams applying the adjustment criteria and using existing planning documents and inventory.

## Map Interpretation

As stated earlier, the maps of public land retention zones are presented as a policy guide, not as a rigid prescription. Future land use plans may revise the boundaries currently drawn. Activity plans done on individual tracts may reveal lands within the retention zone appropriate for disposal and many tracts outside the retention zones essential to retain or acquire.

## Retention Zones

The retention zones define areas where BLM intends primarily to retain or enhance the existing public land holdings. Public lands in most of these zones amount to sizeable acreages, most are in reasonably consolidated holdings or contain resource values appropriate for public ownership.

Individual tracts in retention zones may be exchanged when significant management efficiency or a greater public values would be acquired. Under some circumstances a tract may be sold to serve an important public purpose. Public land acreage within these zones is not anticipated to decline but may increase because land acquisition in exchanges will be concentrated in these zones.

## Other Lands

Public lands in this area are open to consideration on their individual merits for retention, exchange, transfer or sale. In general, the lands are in small tracts, widely scattered and often without legal or physical access. It is in this zone that the majority of disposal tracts will be found. Lands meeting the retention criteria (having significant public values) will be retained or exchanged for land with higher public values.

The preferred action regarding lands which fit the disposal criteria is to exchange them for lands within a retention zone. Recent examples include the acquisition of recreation and wildlife lands on Holter Lake near Helena and Howery Island on the Yellowstone River in exchange for a number of rangeland tracts in eastern Montana. Exchanges may also be considered which will acquire publicly desirable tracts outside the retention zones. A net reduction in BLM administered acreage outside the retention zones is expected.

# LAND PATTERN REVIEW AND LAND ADJUSTMENT PROGRAM (EXCHANGES, JURISDICTION TRANSFERS, SALES)

## Land Adjustment Program Phases

### *Phase I—State Director Guidance*

Published in 1983 and containing criteria for categorizing public lands, State Director Guidance is revised with this supplement.

### *Phase II—Land Categorization*

Retention areas are delineated through use of existing completed plans, ongoing planning and the State Director Guidance Supplement. The current delineation/categorization effort is summarized in this supplement and may be modified as a result of future land use planning.

### *Phase III—Land Activity Planning and Realty Implementation*

Program priorities are developed followed by implementation which includes site specific land report-environmental analysis, appraisal, decisionmaking and land title processing.

## Land Pattern Review and Adjustment Criteria

Three types of criteria are presented (retention, disposal, and acquisition) to provide guidance in categorizing the public lands and in making decisions concerning specific land pattern adjustment actions.

The criteria range from specific to general and give direction for statewide consistency while allowing the manager flexibility in responding to local circumstances.

The criteria will be applied on an interdisciplinary basis. This requires consideration of all resource values, but since all values are not normally represented on every tract of land, trade-offs between resource values will usually be necessary when making decisions on specific land adjustment actions. Such trade-offs will be based on a hierarchy of values defined as follows:

1. Requirements of applicable laws, executive orders and regulations will be followed.
2. Priority will be determined by the area directly impacted and the significance of the resources in descending order of national, regional, statewide, and local. Both economic and non-economic values will be considered in assessing resource significance.
3. A critical level of significance will be assigned to resource values if they are adversely impacted over an area larger than the specific tract being considered for land adjustment action.
4. Public value losses which cannot be mitigated will be assigned a higher level of significance than those which can be mitigated.
5. A higher level of significance will be assigned to public values which are associated with solving chronic management problems which past efforts have failed to resolve and for which no other solutions are evident.

### **Retention**

These are lands which will remain in public ownership and be managed by BLM. BLM is interested in exchanges to improve manageability of areas with important public values. Although the underlying philosophy is long term public ownership, minor adjustments involving sales and exchanges of lands may occur when the public interest is better served.

1. Areas of national environmental significance: These include but are not limited to:
  - a. Wilderness, Wilderness Study Areas and Former WSAs being Studied for Protective Management
  - b. Wild & Scenic Rivers
  - c. National Scenic & Historic Trails and Study Trails
  - d. Lands containing nationally significant cultural resource sites nominated to or eligible for the National Register of Historic Places
  - e. National Conservation areas
  - f. Wetlands and Riparian Areas under Executive Order 11990
  - g. Other Congressionally Designated Areas and Study Areas
  - h. Wild Horse Management Areas
  - i. Areas of Critical Environmental Concern

2. Areas of national economic significance: these include but are not limited to:
  - a. Designated Mineral Resource Areas where disposal of the surface would unnecessarily interfere with the logical development of the mineral estate, e.g., surface minerals, coal, phosphate, known geologic structures, etc.
  - b. Public lands containing strategic minerals needed for national defense.
3. Public lands used in support of national defense: these include but are not limited to National Guard maneuver areas.
4. Areas where management is cost-effective or lands containing other important characteristics and public values which can best be managed in public ownership by BLM will be retained. These include but are not limited to:
  - a. strategic tracts along rivers, streams, lakes, ponds, springs, and trails
  - b. community watersheds and/or flood plains
  - c. wildlife priority areas as defined under acquisition criteria for wildlife habitat areas
  - d. Important hunting or fishing areas
  - e. Recreation sites and areas
  - f. Cultural resource sites where the cost of mitigation actions required by disposal would exceed the public benefits of land disposal.
5. Lands with a combination of multiple use values which dictate they should be retained in public ownership and managed by BLM.
6. Areas where future plans will lead to further consolidation and improvement of land patterns and management efficiency.
7. Areas which the general public, state and local government consider suitable for permanent public ownership.
8. Public lands withdrawn by the BLM or another federal agency for which the purpose of the withdrawal remains valid and the resource uses can be managed concurrently by BLM.
9. Public lands that contribute significantly to the stability of the local economy by virtue of federal ownership.
10. Public lands which provide public access and contain previously mentioned public values which, when considered together, warrant their retention.

Guidelines for the retention of the mineral estate are fairly well described and are mandated under FLPMA. These require that the mineral estate will be reserved by the U.S. in all land disposals except in some cases where exchanges are involved. In exchanges, the mineral estate may be reserved by both parties presuming no material interference with development of the mineral resource due to disposal of the surface estate. If values are equal, title may pass with the surface estate.

### **Disposal**

These are lands identified for potential removal from BLM administration through exchange, through transfer to federal, state, county or local public entities or through sale. In addition to land internally identified for disposal, BLM will respond to proposals from the public. Disposal decisions will be made in the public interest based upon the following criteria:

1. Lands specifically identified through land use plans for exchange, transfer, Recreation and Public Purposes Act applications or sale.
2. Lands of limited public value.
3. Widely scattered parcels which are difficult for BLM to manage with anything beyond minimal custodial administration and have no significant public values.
4. Lands with high public values proper for management by other federal agencies, or state or local government.
5. Lands which will serve important public objectives (such as community expansion) as provided in FLPMA Sec. 203(a)(3).
6. Lands where disposal would aid in aggregating or repositioning other public lands or public land resource values in retention areas to facilitate national, state and local objectives.

7. Lands acquired for a specific federal purpose which are no longer required for that or any other federal purpose.
8. Lands with long term unauthorized use problems, if the lands are not required for public purposes.
9. Lands in which the highest public value will be attained through long term agricultural, commercial or industrial development.

### **Acquisition Criteria**

These are used to evaluate proposals which would result in the acquisition of lands, easements or minerals by the Bureau of Land Management through exchange or other transactions.

These criteria help to assure that any BLM decision to acquire a tract of land provides significant public benefits. The criteria range from "general" standards to evaluate all proposals, to "specific" guidelines covering the selected or prioritized program areas.

These standards are designed to provide consistent direction, while allowing management flexibility to meet local, state and national needs.

#### *General Criteria for Acquisition (and Retention Decisions)*

All proposals will be evaluated to determine if the acquired lands will:

1. Facilitate access to areas retained for long term public use.
2. Enhance Congressionally designated areas, rivers or trails.
3. Be primarily focused in the "retention" areas. Acquisition outside the retention areas will only be considered if the action leads to and/or facilitates long term needs or program objectives.
4. Facilitate national, state and local BLM priorities or mission statement needs.
5. Place emphasis where BLM land use or activity plans are completed. Proposals must facilitate implementation and/or be consistent with these plans.
6. Stabilize or enhance local economies or values.
7. Meet long term public land management goals as opposed to short term.
8. Be of sufficient size to improve use of adjoining public lands or, if isolated, large enough to allow the identified potential public land use.
9. Allow more diverse use, more intensive use, or a change in uses to better fulfill the Bureau's mission.
10. Enhance the opportunity for new or emerging public land uses or values.
11. Contribute to a wide spectrum of uses or large number of public land users.
12. Facilitate management practices, uses, scale of operations or degrees of management intensity that are viable under economic program efficiency standards.
13. Secure for the public significant water related land interests. These interests will include lake shore, river front, stream, pond or spring sites.

#### *Program Specific Acquisition Criteria*

Any of these program criteria may provide the rationale for acquiring a particular tract of land in land adjustment transaction; however, priority will be determined on the basis of multiple use analysis. That is, the greater the number of programs and public values served, the higher the priority for acquisition.

#### *Minerals*

1. Consolidation of ~~mineral~~ mineral estates—from the minerals program viewpoint this is probably the most important reason for acquisition. The primary purpose for consolidation of estates is improvement of potential for development while improving resource management and economic values.

This concept can be applied to some deposits of coal, phosphate, potash, oil shale and tar sands. It is difficult to envision that this approach would be useful for oil and gas or locatable minerals.

2. Acquisition in response to a federal project need, as in the case of a dam project. Criteria for this type of acquisition would generally include:
  - a. Where development of the federal project would preclude the mineral estate owner from exercising development rights; or
  - b. Where the exercise of the mineral estate owners right of development would materially interfere with the federal project.
3. Acquisition mandated by law. The best example of this would be where an alluvial valley floor has precluded coal mining, triggering an exchange.

#### *Livestock Management*

Acquire non-federal holdings in key allotments which will enhance manageability and investment opportunity in improvement and maintenance category allotments.

#### *Timber Management*

Focus acquisition priority on areas:

1. Which exceed 30 cu. ft/acre in growth of commercial timber unless the areas will enhance the harvest of adjacent lands. In this case, the standard may be lowered to 20 cu. ft/acre in annual growth.
2. Contiguous to, or which facilitate access to public forest land.
3. Containing 80 acres or more of commercial timber. If less than 80 acres, the tract(s) must be logical logging unit(s) or facilitate commercial management of adjacent public forest land.
4. Containing enough harvestable volume for a feasible commercial logging unit after physical, biological or other land use constraints are considered.

#### *Recreation*

Acquire lands with the following significant public values:

1. National Values
  - a. Congressionally designated areas/rivers/trails
  - b. Congressionally designated study areas/rivers/trails
2. State Values
  - a. Select lands that enhance state recreation trails and waterways (see State Comprehensive Outdoor Recreation Plan; SCORP Vol. 2, 1978, p. 149) or those with interstate, state, and multi-county use significance
  - b. Other statewide and multi-county values
3. Local values for extensive use, such as hunting, fishing, ORV and snowmobile use. Higher priority will be given to acquisition of these values where such extensive use will compliment and enhance these uses on public lands.
4. Acquire access through easement to the above significant values as needed to facilitate public use if surface acquisition is undesirable or not possible.

#### *Wilderness*

Acquire in-holdings within the boundaries of Congressionally designated wilderness areas under BLM administration. Priorities are:

1. State in-holdings to be acquired through exchange only
2. Private in-holdings to be acquired by mutual agreement involving exchange, purchase, or gift

In the acquisition of access to designated wilderness areas highest priority will be:

1. Where no access exists
2. Where it is needed for proper management as identified in wilderness management plans

#### *Cultural Resources*

Any cultural site to be acquired should meet the following evaluation standards of MSO Manual Supplement 8111.24:

1. High Research Value
2. Moderate Scarcity
3. Possess some other unique values such as association with an important historic person or high aesthetic values, or
4. Contribute significantly to interpretive potential of cultural resources already in public ownership.

Strong consideration should be given to manageability. There are only a limited number of potential uses to which a cultural resource can be put (see IM 78-339). The principal use is probably research. Any site acquired for this purpose should be protectable and accessible. The second most important use may be some form of visitor or recreation use. Acquired sites in this case should be in areas also important to the Recreation Program unless they can stand on their own.

The major deciding factor for site acquisition after applying the basic criteria should be the potential for actively managing the site. Sites should not be acquired on scattered or isolated parcels unless they are of overwhelming cultural importance.

#### *Wildlife Habitat Management*

In general, areas with important wildlife habitat which are large enough and suitable for public hunting, fishing and trapping and areas suitable for cooperative management under the Sikes Act.

High priority areas for retention and acquisition will be lands with significant wildlife values as defined below. These areas may be of any size.

1. *Threatened and Endangered Species* (approved recovery plans will also govern actions on these areas)
  - a. *Black-footed Ferret*. Occupied habitat or areas identified through planning for future ferret populations.
  - b. *Grizzly Bear*. Lands containing grizzly population centers (Management Situation 1 and 2 Lands\*).
  - c. *Whooping Crane*. Suitable or potential habitat.
  - d. *Bald Eagle*. Historical nest sites with remaining potential, present nest sites, or documented roosting or wintering areas.
  - e. *Grey Wolf*. Occupied habitat.
  - f. *Peregrine Falcon*. Verified nest areas and suitable sites for reestablishment.
2. *Fisheries.\*\** Access to or larger areas adjacent to Class 1, 2 or 3 streams\*\* and lake and pond fisheries. Stream areas with restoration potential to become Class 1, 2 or 3 streams. Sites to develop additional fisheries especially near population centers. Sites supporting spawning or nursery areas which may be temporal in nature but important to downstream fisheries. Land that would enable us to acquire needed instream flow reservations.
3. *Big Game*. Important habitat areas such as crucial winter and associated spring/fall transition areas, kidding/fawning/calving/lambing areas, crucial wallow complexes, mineral licks, and security areas.
4. *Upland Game Birds, Migratory Birds and Waterfowl*. Crucial breeding, nesting, resting, roosting, feeding and wintering habitat areas or complexes. These will vary in size, for example, a highly productive one acre wetland or 100 acres of nesting cover for pheasants.
5. *Raptors*. Existing and potential nesting areas for sensitive species or significant nesting complexes for nonsensitive species.
6. *Nongame*. Crucial habitat complexes.

\*From Guidelines for Management Involving Grizzly Bears in Yellowstone Area, USFS, NPS 1979.

\*\*Class of streams defined by Montana Department of Fish, Wildlife and Parks, 1980. Stream Evaluation Map State of Montana.

## MAP ANALYSIS

Table I summarizes the acreage identified for retention by district and by state. Montana districts range from 91 percent retention in Lewistown to 85 percent in Miles City. The state average is 88 percent. Retention percentages in North and South Dakota are 65 and 68 percent respectively, but because of smaller total acreages in those states, the three-state average is 87 percent.

TABLE I  
POTENTIAL LAND ADJUSTMENT SUMMARY  
BLM ACREAGE (X 1000)

	In Retention Zones	Percent of Total	Other Lands Outside Retention Zone	Percent Total	Total
Montana*	7,122	88%	987	12%	8,109
South Dakota	177	68%	85	32%	262
North Dakota	44	65%	24	35%	68
Three State	7,343	87%	1,096	13%	8,439
*Break-down of Montana by District Office:					
Butte DO	1,259	88%	175	12%	1,434
Lewistown DO	3,119	91%	315	9%	3,434
Miles City DO <sup>1</sup>	2,744	85%	497	15%	3,241
Montana Total	7,122		987		8,109

<sup>1</sup>Miles City DO total does not include South Dakota Resource Area.

### Retention Zones

These zones predominantly contain public lands that meet the retention criteria.

All BLM lands in nationally designated areas will be retained: including the Upper Missouri National Wild and Scenic River, all wilderness study areas, Lewis and Clark National Historic Trail, Pryor Mountain Wild Horse Range, Square Butte Outstanding Natural Area and all designated National Register Historical and Cultural Sites.

### Other Lands

These lands generally are scattered tracts that are difficult to manage due to their small size, very limited legal access, and distance from the office administering them. In many cases, the resource values of these lands are low.

Although these lands are open to consideration for all types of land adjustment actions, many parcels of land where significant resource values are found will be retained under BLM management. Also, some parcels may be encumbered in a variety of ways that require public retention. Examples are withdrawals, recreation and public purpose leases, or mining claims. The Dillon Resource Area has several strips of land withdrawn for stock driveways that lie in the open zone. Land within a municipal watershed would be retained. Also, tracts would be retained to be consistent with state and local land use plans or other agency's policies. Enhancement of national historic trails such as the Continental Divide Trail may require that isolated tracts be retained.

### The Montana Map

The BLM ownership information on this map was taken from a base prepared several years ago and is no longer completely accurate; however, the retention zone boundaries were developed using current larger scale work maps.

In Montana the retention zones encompass large, generally compact areas of public land which provide for the most efficient management and the fewest access problems. Smaller units were delineated where resource values are high. This includes areas along rivers or where the lands reflect public priorities such as wilderness study areas. In eastern Montana some areas of rather limited surface ownership are classified for retention because of a significant Federal mineral estate.

The zones, as delineated, are generally consistent with existing plans and plans in progress. However, in the Dillon Resource Area (southwest Montana) the land use plan completed in 1979 did not identify zones, but instead identified specific tracts for acquisition and disposal. A programmatic environmental assessment was completed for these disposal tracts in October 1983. The adjustment zones as defined in this document are not entirely consistent with the terms of the Dillon MFP, in that considerations of any additional land sale proposals not covered in the programmatic environmental assessment in 1983 would require plan amendments.

A substantial block of BLM-administered land in the Big Snowy Mountains adjacent to the Lewis and Clark National Forest is not included in a retention zone. This apparent inconsistency results from a decision in the Billings Resource Management Plan to transfer this land to the U.S. Forest Service at some future date.

## **South Dakota Map**

The South Dakota Resource Area, under the Miles City District, covers the entire state. The lands administered by BLM in South Dakota total approximately 262,000 acres. A single map showing the BLM lands in South Dakota was not available, therefore, the retention zones were delineated from large scale working maps. The BLM ownership within the retention zones was then drafted using current information. BLM ownership outside the retention zone is not shown.

A total of 177,000 acres or 68 percent of the BLM lands in South Dakota are contained in the retention zones. These are in four relatively compact clusters in the northwest quarter of the State. These zones were defined to correspond to the larger concentrations of public lands. A number of the tracts contained in the eastern-most zone along the Oahe Reservoir also reflect high recreation values.

A total of 85,000 acres or 32 percent of the lands administered by BLM in this resource area lie outside the retention zones. These are scattered tracts mostly in the western part of the state and intermingled with state lands, other federal lands and tribal lands.

## **North Dakota Map**

The Dickinson District contains all of the BLM administered lands in North Dakota, a total of approximately 68,000 acres. Most BLM lands are in the western half of the state and there are only two areas of significant concentration. These lie along the Little Missouri River in Dunn County and western Bowman County in the southwest corner of the state. As in South Dakota, a single current map of BLM administration in North Dakota was not available. Retention zones were identified from larger scale maps and within those zones the current land holdings are shown.

The retention zones contain approximately 44,400 acres or 65 percent of the total surface acreage BLM administers in North Dakota. About 40,600 acres of the BLM lands within these zones are in two counties, Dunn and Bowman; and there are minor acreages in Williams, McHenry, Divide, Burleigh and McLean counties, totalling 3,800 acres.

Generally, lands within the retention zone will be retained in federal ownership or exchanged for other lands within these zones. These lands may also serve as core areas for acquiring adjacent lands in exchange for BLM lands categorized for disposal outside the retention zones.

There are many valuable resources on BLM lands in Bowman and Dunn Counties, and a variety of uses occur, including grazing, dispersed recreation, hunting, fishing, and oil and gas development. Lands located within the retention zones in other counties may also contain many resources or may be wetlands or riparian lands with more limited uses, such as providing wildlife habitat, recreation or water storage.

The area outside the retention zones contains approximately 23,600 acres or 35 percent of the BLM surface in North Dakota. Of this, 6,000 acres are located in Bowman County, and the remaining 17,600 are scattered among 31 counties across the State. Generally, the tracts of land within this zone

**RECREATION PROGRAM GUIDANCE  
REVISIONS**



are available for disposal, except for wetlands, which have public value for water retention and wildlife habitats. Lands that fall within this area are available for disposal through exchange or transfer to another public agency or through sale. Preference will be given to exchanging lands in this area for lands within the retention zone.

It is also recognized that limited acquisition outside the retention zones may be justified on the basis of one or more of the acquisition criteria listed in this document.

The primary objectives of adjusting BLM land pattern are to: improve management efficiency; make the public lands in North Dakota more accessible and usable by the general public; and, in general, enhance recreation opportunities and natural resource protection in the State.

## **LAND ADJUSTMENT IMPACTS**

About 1.1 million acres of BLM administered land is found outside the designated retention areas. Less than half of this acreage may actually be affected by land adjustments because of a variety of constraints. If a detailed examination of any tract finds values that fulfill the retention criteria it will normally be retained. Opportunities for publicly beneficial exchanges or transfers may not be found for many tracts of otherwise disposable land.

### **Resource Impacts**

Effects on the Bureau's resource programs are expected to be significantly positive. Under terms of the land adjustment criteria the lands important to BLM resource management programs will be retained. Lands of lesser value will generally be exchanged for lands which will make a greater contribution to public resource management objectives.

Some adverse effects may occur to lands which pass out of Bureau control because the Bureau cannot guarantee the future stewardship of the new owner. However, it is BLM policy to avoid disposal actions where the intended future use is harmful to the resource base or to community interests. Generally the lands coming into federal ownership and control will be important for public use.

### **Management and Access**

By consolidating its land holdings the BLM can increase its management efficiency through economics of scale. This could be the result of working with fewer livestock operators, decreased travel costs to manage isolated tracts and decreased paperwork associated with casefiles and other management problems.

Consolidation would facilitate such management projects as land, watershed or vegetative treatments or wildlife habitat programs. Transfers of some public land tracts could make management more efficient and produce more public benefits under management of another agency or organization.

Access to public lands should be enhanced by the BLM acquiring key tracts or easements that would assure the public legal access to blocks of public lands. Improved access will generally increase recreational use in areas where a checkerboard ownership pattern now restricts public use.

### **Social and Economic Effects**

The BLM is required by law to establish through standard appraisal procedure the fair market value of lands to be exchanged or sold.

In some cases a private landowner who adjoins a piece of public land and wishes to add it to his agricultural operation may feel that such a valuation greatly exceeds the return that can reasonably be expected from the agricultural use of the land. This can result because the appraisal considers comparable sales on the open market and the potential highest and best use in economic terms, such as rural subdivision.

Therefore, they fear loss of agricultural use of the public land to individuals who will pay fair market value because they intend to convert the land to another use such as homesites.

Similarly, the holder of a grazing lease on a tract identified by BLM for disposal will be offered the opportunity to acquire it through exchange or purchase. The ability of the lessee to participate can vary widely and there is a potential for adverse impacts to some operations through loss of the leased area or through additional financial burdens resulting from its acquisition.

County governments will experience some effect on Payments in Lieu of Taxes (PILT) and payments from grazing and mineral receipts if public lands in their counties are exchanged for lands in another county. When public lands are transferred to private ownership the tax base in the affected county will thereby be increased and the PILT and other payments decreased.

The net fiscal effects on local governments depend upon the type of land adjustment. They depend upon whether the land adjustments are with private landowners, state governments, local governments or other federal agencies. They would also depend upon whether exchanges are largely within or between counties and how the tax return on lands passing into private ownership compares with the level of PILT payments and grazing and mineral fees returned for these lands. Tax exempt lands acquired from state or local governments through exchanges would be excluded from PILT.

Public attitudes regarding specific land adjustments may also vary widely depending upon the type of land transfer, the reasons for the transfer and individual perceptions of who may gain or lose from the transfer.

## RECREATION

The Bureau has demonstrated a limited capability to obtain funds to sustain any kind of consistent recreation development programs.

However, we should take advantage of existing situations and capabilities to provide for future public needs. We are in a better position, in terms of skills and land pattern, than any other Federal agency to acquire recreation opportunities through purchase or exchanges. We have the capability to use the scattered tracts of public land as a trading base to acquire areas or easements for access. This is particularly true in locations where there is no single Federal reserve and where there are limited public use areas, whether State or Federal. Through acquisition the public will be provided use of such areas (described below) or they can be held for future public management options.

The RMP should identify access needs to recreation resources of national or state value. We would then be in a position to acquire such values when opportunities for purchase or exchange present themselves. Parameters of such a program are listed below, but generally, the objective is to provide both legal and physical access to strategic locations. For example, for river floating the strategic location could be—one access point per four hours of float or at highway crossings; for historic battlefields—one prominent viewpoint; or for National trails—one access point per 10-15 miles or at State highway crossing. Location and number of access points will depend on the significance of the value and the anticipated demand. Both of these should be determined through the planning system with public involvement.

New, fully developed destination type areas will not be provided by the Bureau in the tri-state area, unless there is a significant issue identified that suggests Bureau development. Generally, this type of facility will be recognized as being provided by other Federal or the State agencies.

The following are the parameters of the suggested recreation program. These are outside parameters and a general (not absolute) hierarchy from most important to lowest priority.

Opportunities beyond those listed can be identified and discussed in the RMPs, but should be looked on as recreation resources to manage on a custodial basis until some other agency, group or individual can be found to take over management. Such management can be by lease, cooperative agreement, or transfers.

### **Kinds of Ownership Actions We Will Take**

1. Retention of public use areas and access routes (trail or motorized) to public lands involving the opportunities described below.
2. Acquisition of strategically located lands for public use of recreation opportunities described below. These can be through exchange, purchase, contributions or easements.
3. Acquisition of access to opportunities or strategically located lands for public use of recreation opportunities described below.

Generally, we will not assist other Federal agencies in blocking up or eliminating in-holdings for recreation purposes unless public support and interest is generated during the planning effort.

### **Kinds of Opportunities on Which We Will Concentrate Our Efforts**

1. Existing nationally recognized resources (Congressionally designated):
  - A. Upper Missouri Wild and Scenic River
  - B. Lewis and Clark National Historic Trail
    - (1) Upper Missouri Wild and Scenic River segment
    - (2) Yellowstone River segment
    - (3) Upper Missouri River area
    - (4) Lower Missouri River segment
    - (5) Land based trail, Three Forks to Park City
    - (6) Marias River area
    - (7) Blackfoot River
  - C. Continental Divide National Scenic Trail
  - D. National Wilderness areas under BLM management
  - E. National Conservation, Natural Historic or other special type areas (Pryor Mtn. Wild Horse Range).

2. Potential national values (designated by Congress for study):
  - A. Nez Perce Trail
  - B. Yellowstone River
  - C. North Country Trail
3. Statewide recognized values defined in the Statewide Comprehensive Outdoor Recreation Plan (SCORP) as a Federal role or identified for cooperative management.
  - A. Recreation trails, waterways or rivers/streams with free flowing value (see SCORP Vol.2, 1978, p. 149).
  - B. Other recognized recreation sites/areas, cultural, natural or scenic values under BLM management: Garnet, Fort Meade, and Square Butte.
4. Local recreation areas (see FLPMA, Sec. 206a) for extensive use such as hunting, fishing, and snowmobile use.

#### **Kinds and Levels of Development We Will Consider**

1. Limited development/ uncontrolled use. Development will be limited to identification through signs and maps of public use areas and access routes. Heavy reliance will be put on map handouts.
2. Primitive facilities where use exceeds natural carrying capacity. Development probably limited to parking, privy, and water access ramp on sites 10 acres or less.
3. Access development: Low standard (e.g., foot trails, ORV trails, or primitive roads).
4. Low level development site with camp unit, loop road, privies, water and other support facilities as necessary. Development will not exceed 20 units on sites of 50 acres or less.

#### **Off-Road Vehicle Designations**

Formal designations will be made for areas where problems have been identified. Plans are to identify areas in which ORV use is restricted or closed. All other areas will be considered open and receive formal designation only when considered necessary by the District Manager.

Each activity specialist shall have the responsibility for considering ORV designation needs to protect his own particular resource values by using the following minimum set of planning criteria:

1. Damage caused by ORV use to soils, watershed and vegetation shall be minimized.
2. Harassment of wildlife or significant disruption of habitat shall be minimized.
3. Conflicts between ORV use and other existing or proposed uses for the same or neighboring public or private lands shall be minimized; e.g., wilderness.

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# Appendix I

## Drought Policy



# **APPENDIX I**

## **DROUGHT POLICY**

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### **Bureau of Land Management**

### **POLICY FOR ADMINISTERING PUBLIC LAND GRAZING**

### **IN**

### **MONTANA, NORTH AND SOUTH DAKOTA**

### **DURING PERIODS OF DROUGHT**

#### **I.1 INTRODUCTION**

Livestock grazing is but one of the activities that BLM manages on the public lands. Drought stresses many resources and resource uses including recreation, soils, timber, vegetation, watersheds, and wildlife as well as livestock forage. However, only livestock and human activities can be readily controlled or restricted from access to public lands. The other resources are either immobile or not readily controlled. This policy deals with livestock use and implements provisions of current laws and regulations. Other uses that may require special consideration during severe drought may be addressed in separate policy statements or actions.

Vegetation cover is one part of productive rangelands because it strongly affects soil moisture. When drought reduces the total forage produced and the normal residual vegetation (standing and down plant material) is used by livestock, insects, and other grazing animals, soil moisture and temperature are affected. Soil temperatures are lowered by the residual cover during warm periods and are raised by the residual cover during cold periods. Moisture intake and penetration into soils is keyed to the amount and type of residual cover found on a soil/ecological site. In fact, with little or no residual cover on rangelands, moisture events will likely produce little effective penetration into the soil. Residual cover provides protection for soils, vegetation, wildlife, watersheds, and for the many other resources dependent upon good vegetation and livestock management.

## **I.2 AUTHORITY**

This document implements provisions of:

- Taylor Grazing Act of June 28, 1934, as amended;
- Federal Land Policy and Management Act of 1976, as amended;
- Public Rangelands Improvement Act of 1978;
- Regulations in 43 code of Federal Regulations, Group 4100(43 CFR 4100).

## **I.3 POLICY**

This policy is meant to supplement the national drought policy as set forth by Washington Office Instruction Memorandum 2013-094.

It is the policy and objective of the BLM to: manage the public lands and authorize livestock grazing under the principles of multiple use and sustained yield; provide for the orderly administration of grazing by domestic livestock on the public lands; and provide for productive and healthy soil and vegetation resources as well as other environmental values.

Accomplishment of these objectives becomes more difficult during periods of range depletion caused by drought. Normal grazing schedules and livestock management practices may have to be modified. Additional coordination, consultation, and data exchange between livestock operators and Bureau personnel will be required, over and above the level normally practiced. Appropriate local, state and Federal agencies and the interested public will have to be involved at times and consistently kept informed.

The principal thrust of the policy and procedures in this document, and other regulatory and procedural requirements not repeated here, will be for the livestock operator and BLM to jointly develop strategies for livestock use on public land during and following drought. Strategies selected should be those that best protect rangeland resources while minimizing impacts on the operator to the extent possible. To that end, every degree of flexibility provided by the laws and implementing regulations will be available to authorized officers of the Bureau.

Voluntary adjustments in livestock use of public lands should be sought at the earliest date it becomes apparent that "normal" grazing schedules cannot be followed, or, if followed, would result in long-term resource degradation. The earlier an agreement can be reached or a decision made that "normal" grazing schedules cannot be followed, the more opportunities livestock operators will have to consider alternatives to minimize impacts on his or her operation. Waiting until the last minute before scheduled turnout to make a determination or decision will reduce the options available to both the operator and the Bureau.

An interdisciplinary approach (within the confines of scarce skills availability) to identify natural resources and other applicable public values vulnerable to drought will be used to prioritize allotments for attention. Second, efforts to manage public rangeland under drought conditions will be directed next to allotments with resource concerns—typically "I" category allotments. Specific allotments in the "M" and "C" categories can also be considered high priority when resource values or conditions so require. Regardless of the category assigned to an allotment, operators should be aware of the procedures and flexibilities available for dealing with drought conditions.

BLM fully expects that the vast majority of livestock operators will recognize the need and voluntarily make adjustments in livestock use of public lands the longer a drought persists. These adjustments will be recognized during the application process and grazing bills will be adjusted accordingly. Adjustments in grazing use may include but are not limited to reducing livestock numbers, shortening the season of use, altering pasture move dates, changing pasture rotations, authorizing water hauling (after documenting NEPA compliance), closing allotments to grazing use, or allowing use in vacant allotments.

- Regulatory mechanisms to voluntarily implement grazing use changes include approval of applications for voluntary non-use (43 CFR 4130.2(g)), or approving applications for changes within the terms and conditions of permits and leases (43 CFR 4130.4(b)), or some combination.
- Line officers also have the option to implement needed changes through a formal agreement between the BLM and grazing operator (which is recommended to be implemented by decision) that specifies the drought-related grazing adjustments (43 CFR 4110.3-3(a)), or by temporarily suspending or otherwise modifying use via a decision that may be put into immediate effect, if necessary (43 CFR 4110.3-2(a) and 3-3(b)).[2]
- If using an agreement or decision, indicate within it the intended duration of the drought-related adjustments and include supporting rationale for the indicated timeframe.
- Regulation 43 CFR 4130.6-2 provides the mechanism for the BLM to authorize use in vacant allotments. Do not modify permits and leases (43 CFR 4130.3-3) to make drought responsive short-term grazing use adjustments.

Offices are required to screen any proposed drought mitigation strategies and actions to determine if they trigger the requirement for National Environmental Policy Act (NEPA) compliance documentation and if so, whether existing documentation is adequate or whether additional analysis is needed. Addressing drought management in Resource Management Plans or Allotment Management

Plans, or preparing programmatic drought action plans, provides pro-active opportunities to address potential conditions and contingencies.

In those situations where agreement cannot be reached, authorized officers of the Bureau have the final responsibility and accountability for ensuring that public lands are not permanently damaged by improper use. If issuance of a decision concerning livestock use becomes necessary, the procedure specified in 43 CFR 4160 will be followed. It should be further understood that final decisions can be modified or rescinded, if the conditions that existed when the decision was issued no longer exist. If significant amounts of precipitation occur during the growing season, producing significant changes in the amount of moisture available to plants, this may cause decisions to be reconsidered. The consultation, cooperation, and coordination process will be used to obtain livestock operator and stakeholder involvement in such cases.

## **I.4 PROCEDURES AND GUIDELINES**

The following guidelines and procedures are intended to provide the data, flexibility and direction for public land managers and livestock operators to develop strategies and make decisions during drought conditions. Consultation and coordination with livestock operators and other interested parties will be carried out during all procedural steps.

### **I.4.1 Winter Assessment (Late-October - February)**

#### ***Analysis***

1. Review the past season's monitoring results. Analyze plant growth, actual use, insect infestation occurrences, utilization, use pattern maps, residual cover, and especially the use of "rest" pastures. Review the past season's land health assessments in areas of concern.
2. Analyze precipitation records and distribution patterns from the National Weather Service, the [Montana Drought and Water Information website](#), the [North Dakota Drought website](#), the [South Dakota Drought website](#), local cooperators, BLM, and other agencies. Tabulate moisture departures from normal levels and timing of precipitation in relation to past years' growing season.
3. Determine whether currently available data is sufficient to inform and support drought responsive actions.
4. In identified priority or "I" allotments where there is concern because there is limited residual cover, effective precipitation well below normal, rest pastures already used, abnormally high utilization or use patterns, etc., field offices may opt to measure soil moisture in representative areas for additional data. Where available, use RAWs/OMNI sites, existing soil moisture stations, NRCS SCAN soil climate monitoring sites, etc. Additional soil moisture samples

are to be taken at the rooting depth of major forage species in representative areas using techniques found in agency manuals/handbooks, the professional literature and extension publications.

**Action**

1. Where it is apparent resource degradation might occur if drought continues, begin to notify operators through letters and news releases that the coming year's livestock grazing could be affected.
2. Set up range user meetings in affected communities to discuss available information and possible actions to prevent range resource damage.
3. Encourage operators to make needed changes in their grazing schedules, including applying for non-use. If non-use is taken, but activated later should conditions change, BLM will waive the \$10 service fee in accordance with 43 CFR 4130.8.3. Authorized officers may issue refund or credit of grazing fees under 43 CFR 4130.8-2(b).
4. Meet with individual operators when available information indicates a particular allotment is affected by severe drought condition. Attempt to reach agreement on alternative grazing strategies if conditions do not change.

**I.4.2 Late Winter and Spring Assessment (February - April)**

**Analysis**

1. Review precipitation and soil moisture data for winter and early spring.
2. Review the effects of winter grazing use; snow pack influence for stock water, soil temperatures, etc-
3. Continue soil moisture measurements or monitoring where problems are apparent or in areas of concern. Measurements at rooting depth to measure available water for plants will be especially important during this period.
4. Assess availability of livestock water, in consultation with permittees.
5. Assess the availability of water for wildlife.

**Action**

1. If drought conditions are continuing, or becoming more severe, follow up winter letters and news releases with updates and attachments to grazing applications. Conduct meetings with Cooperative State Grazing Districts and Resource Advisory

Councils. Meetings are encouraged with other concerned individuals and agencies as a part of the grazing management strategy.

2. Contact remaining operators who have not voluntarily made needed changes. Where you believe you have enough information to indicate an allotment is in severe drought condition, meet with the operator to review and explain the information you have and attempt to reach agreement on a grazing strategy. If an agreement cannot be reached and, especially if the allotment has a relatively early turnout date, issue a proposed decision. The extent of use adjustment contained in this decision (delayed turnout, reduction in numbers or duration, total exclusion, etc.) will depend on your assessment of all the factors involved. These include past grazing use, range condition, residual cover, precipitation, soil moisture and the land use objectives for the allotment.
3. If soil moisture is very dry and tending to blow away (Quick Assessment), or below the average soil moisture between field capacity and wilting point (Volumetric Measurement), delay turnout until key forage plants have grown to the 3-4 leaf stage (approximately one-half their normal height--for most of our native grass species about 6 inches). (Manske 2003, Manske 2011, Fraser 2003)

### **I.4.3 Continuing Assessment (throughout grazing season)**

#### ***Analysis***

1. Continue to closely monitor precipitation in "I" allotments and areas of concern. Attention is directed to determining effective (soil moisture) growing season precipitation.
2. Closely monitor utilization of key plant species and key areas. Remember to consider management objectives when selecting key species and areas.
3. Continue to monitor soil moisture in "I" allotments and areas of concern.
4. Monitor factors other than livestock grazing, such as insect infestations, congregations of wildlife, availability of livestock water, etc.
5. Monitor forage, habitat and water needs for wildlife. Consult with state wildlife agencies as needed.

#### ***Action***

1. If soil moisture drops below the average soil moisture between field capacity and wilting point (Volumetric Measurement) and utilization has reached objective levels or a maximum of 30 percent utilization has occurred, livestock are to be removed.

2. If soil moisture remains unacceptable (completely dry and blows away (Quick Assessment)) or below wilting point soil moisture levels (Volumetric Measurement) during most of the spring and early summer with little or no growth in primary forage species for livestock (i.e., range readiness has not been reached), advise affected permittees that fall and winter ranges may not be available for use during the current year. Also advise that production in subsequent years may be affected if plant basal areas and density have been severely reduced.
3. For those permittees in "I", allotments with AMPs having available standing forage in rest pastures or fall or winter use pastures, advise the permittees that livestock must be removed from public lands when consumption of standing forage has reached objective levels or a maximum of 50 percent.
4. Adjust monitoring plans to collect data concerning residual cover, plant death, loss of basal area, density, and yield for analysis and use in later years.
5. Utilize interdisciplinary teams to ensure wildlife forage and water requirements are considered when determining adjustments.

#### **I.4.4 Other Considerations**

1. The use of salt, mineral, and certain mineral supplements as necessary to overcome natural shortages of minerals in rangeland forage may be authorized as necessary to provide for proper range management(4130.3-2(c)).
2. Maintenance feeding on public lands is not authorized except under very unusual short-term conditions and by permit only. Maintenance feeding during drought conditions is specifically excluded.
3. Applications for a maintenance feeding permit due to poor forage conditions associated with drought should be denied and livestock removed or not allowed.
4. Review RMP guidance on wildlife habitat objectives.

#### **I.4.5 Definitions**

*Available water:* That portion of water in a soil that plants can extract from the soil—generally measured per unit volume of soil; the amount of water in a soil between field capacity and permanent wilting point.

*Basal area (range):* The area of ground surface covered by the stem or stems of a range plant, usually measured 1 inch above the soil in contrast to the full spread of the foliage.

*Density:* (1) The number of individual plants per unit area; (2) Refers to the relative closeness of plants to one another.

*Field Capacity:* The maximum amount of water held in a soil, measured a few days after it has been thoroughly soaked and allowed to drain freely.

*Flexibility:* The ability to alter the grazing management plan to meet changing conditions.

*Flushing:* Feeding female animals a concentrated feed shortly before and during the breeding period for the purpose of stimulating ovulation.

*Growing season:* In temperate climates, that portion of the year when temperature and moisture are usually most favorable for plant growth.

*Key species:* (1) Forage species whose use serves as our indicator to the use of associated species; (2) Those species which must, because of their importance, be considered in the management program.

*Maintenance feeding:* Supplying feed to range animals when available forage is too limited to meet their minimum daily requirement (examples are cubes, pellets, baled or loose hay).

*Permanent Wilting Point (PWP):* The soil water content at which water is no longer available to plants, causing them to wilt because they cannot extract enough water to meet their requirements.

*Phenology:* The study of periodic biological phenomenon such as flowering, seeding, etc., especially as related to climate.

*Range readiness:* The defined stage of plant growth at which grazing may begin under a specific management plan without causing permanent damage to vegetation or soil.

*Supplemental feed:* A feed which supplements the forage available from the public lands and is provided to improve livestock nutrition and good animal husbandry and rangeland management practices. An example is salt or mineral block. Creep feeders to supplement feed for calves and supplemental feeding to "flush" cattle and sheep for breeding may be authorized on public lands when compatible with the resource management objectives.

#### **I.4.6 Soil Moisture Monitoring Methods Appendix**

##### **Quick Assessment**

Soil moisture readings taken from 3 rooting depths of key forage species (e.g., 4-6 inches, 10-12 inches, 16 inches up to 3 feet) will indicate whether various key forage species have adequate moisture for growth. Squeeze the soil in your

hand. Does it form a ball? If so, you probably have adequate soil moisture for growth. If it doesn't form a ball, but your hand feels cool, you probably have some soil moisture left. If the soil is completely dry and blows away, there is likely not enough moisture to sustain plant growth. (Howery 1999).

<b>% Available water remaining</b>	<b>Coarse (Sand - Loamy Sand)</b>	<b>Light (Sandy Loam)</b>	<b>Medium (Loam, Silt Loam, Silty Clay Loam, Clay Loam, Sandy Clay Loam)</b>	<b>Heavy (Sandy Clay, Silty Clay, Clay)</b>
0 (PWP or drier)	Dry, loose, single grained, flows through fingers	Dry, loose, flows through fingers	Powdery, dry, sometimes slightly crusted but easily breaks down into powdery condition	Hard, baked, cracked, sometimes has loose crumbs on surface
< 50	Still appears to be dry; will not form a ball with pressure	Still appears to be dry; will not form a ball	Somewhat crumbly but will hold together from pressure	Somewhat pliable, will ball under pressure
50-75	Still appears to be dry; will not form a ball with pressure	Tends to ball under pressure but seldom will hold together	Forms a ball, somewhat plastic, will sometimes slick slightly with pressure	Forms a ball, will ribbon out between thumb and forefinger

(Table adapted from Manitoba 2013)

### **Volumetric Measurement**

The soil moisture content may be expressed by weight as the ratio of the mass of water present to the dry weight of the soil sample, or by volume as ratio of volume of water to the total volume of the soil sample. To determine any of these ratios for a particular soil sample, the water mass must be determined by drying the soil to constant weight and measuring the soil sample mass after and before drying. The water mass (or weight) is the difference between the weights of the wet and oven dry samples. The criterion for a dry soil sample is the soil sample that has been dried to constant weight in an oven at temperature between 100 – 110°C (105°C is typical). Normally drying is conducted on samples for at least 24 hours. A precision balance scale is needed ( $\pm 0.001$  g.) Volumetric soil moisture can then be determined.

$$\text{Gravimetric soil moisture (W\%)} = \frac{\text{wt. (wet soil)} - \text{wt. (oven dry soil)}}{\text{wt. (oven dry soil)}} \times 100\%$$

$$\text{Volumetric soil moisture (\theta\%)} = \text{gravimetric soil moisture} \times \text{bulk density}$$

{Note: Bulk densities for specific soils can be obtained from the Web Soil Survey.}

Soil moisture measurements can then be compared with water content-15 bar and water content 1/3 bar data for a specific soil from the Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/>). Water content, 15 bar, is the amount of soil water retained at a tension of 15 bars, expressed as a volumetric percentage of the whole soil material. Water retained at 15 bars is significant in the determination of soil water-retention difference, which is used as the initial estimation of available water capacity for some soils. Water retained at 15 bars is an estimation of the wilting point. Water content, one-third bar, is the amount of soil water retained at a tension of 1/3 bar, expressed as a volumetric percentage of the whole soil. Water retained at 1/3 bar is significant in the determination of soil water-retention difference, which is used as the initial estimation of available water capacity for some soils. Water retained at 1/3 bar is the value commonly used to estimate the content of water at field capacity for most soils.

As soil moisture levels approach the wilting point of a soil, the less water available for plants. Plant growth becomes marginal and the plant is stressed. If the plant is further stressed by removal or damage to the top growth, it will begin to lose vigor, roots and thus its ability to grow. It is not unusual to reach this moisture level during late summer in much of Montana, Dakotas, and other semi-arid areas.

#### ***Other Soil Moisture Considerations***

When monitoring soil moisture the following information should be kept in mind:

1. Soil moisture is measured at the depth of plant roots or to a root limiting layer. It will vary by plant(s) and soil type.
2. Soluble salts, gravel and heavy clay will decrease plant available water capacity.
3. Organic matter, good soil structure will increase plant available water capacity (The capacity increases about 1 percent for each 1 percent of organic matter).
4. Soils with water restricting layers like naturally compact subsoil, shallow bedrock or stratification can increase plant available water capacity of the overlying soil layers.
5. Soils that are deep, medium textured and uniform can have decreased plant available water but allow for deeper rooting.

#### **I.4.7 References**

Fraser, D. A. 2003. Using range readiness criteria. Forest Practices Branch, British Columbia Ministry of Forests, Victoria, B.C. Rangeland Health Brochure 5.

Howery, Larry. 1999. Rangeland Management Before, During, and After Drought, AZ1136 University of Arizona Cooperative Extension, 6p. [ag.arizona.edu/pubs/natresources/az1136.pdf](http://ag.arizona.edu/pubs/natresources/az1136.pdf).

Manitoba Agriculture Food and Rural Initiatives Soil Management Guide, table 3-2, website accessed April 2013, <http://www.gov.mb.ca/agriculture/soilwater/soilmgmt/fsm01s03.html>

Manske, L.L. 2003. Biologically Effective Management of Grazinglands, NDSU Dickinson Research Extension Center, Rangeland Research Extension Program 4005. 268p.

Manske, L.L. 2011. Biologically Effective Grazing Management Reduces the Detrimental Effects from Drought Conditions on Grasslands--2nd Edition. NDSU Dickinson Research Extension Center. Range Science Report. 7p.

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# Appendix J

## Oil and Gas Lease Stipulations



UNITED STATES DEPARTMENT OF THE INTERIOR  
Bureau of Land Management  
5001 Southgate Drive  
Billings, Montana 59101-4669

**OIL AND GAS LEASE STIPULATIONS**

**ESTHETICS**--To maintain esthetic values, all surface-disturbing activities, semi-permanent and permanent facilities may require special design including location, painting and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of the Federal Surface Managing Agency (SMA).

**EROSION CONTROL**--Surface-disturbing activities may be prohibited during muddy and/or wet soil periods.

**CONTROLLED OR LIMITED SURFACE USE STIPULATION** --This stipulation may be modified, consistent with land use documents, when specifically approved in writing by the Bureau of Land Management (BLM) with concurrence of the SMA. Distances and/or time periods may be made less restrictive depending on the actual on-ground conditions. The prospective lessee should contact the SMA for more specific locations and information regarding the restrictive nature of this stipulation.

The lessee/operator is given notice that the lands within this lease may include special areas and that such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled, or **if absolutely necessary**, excluded. Use or occupancy will be restricted only when the BLM and/or the SMA demonstrates the restriction necessary for the protection of such special areas and existing or planned uses. Appropriate modifications to imposed restrictions will be made for the maintenance and operations of producing oil and gas wells.

After the SMA has been advised of specific proposed surface use or occupancy on the leased lands, and on request of the lessee/operator, the Agency will furnish further data on any special areas which may include:

100 feet from the edge of the rights-of-way from highways, designated county roads and appropriate federally-owned or controlled roads and recreation trails.

500 feet, or when necessary, within the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams: 1,000 feet, or when necessary, within the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies.

500 feet from grouse strutting grounds. Special care to avoid nesting areas associated with strutting grounds will be necessary during the period from March 1, to June 30. One-fourth mile from identified essential habitat of state and federal sensitive species. Crucial wildlife winter ranges during the period from December 1 to May 15, and in elk calving areas during the period from May 1 to June 30.

300 feet from occupied buildings, developed recreational areas, undeveloped recreational areas receiving concentrated public use and sites eligible for or designated as National Register sites.

Seasonal road closures, roads for special uses, specified roads during heavy traffic periods and on areas having restrictive off-road vehicle designations.

On slopes over 30 percent or 20 percent on extremely erodible or slumping soils.

**See Notice on Back**

## NOTICE

**APPLICATIONS FOR PERMIT TO DRILL (APDs)**--The appropriate BLM field offices are responsible for the receipt, processing, and approval of APDs. The APDs are to be submitted by oil and gas operators pursuant to the requirements found in Onshore Oil and Gas Order No. 1 -- Approval of Operations on Onshore Federal and Indian Oil and Gas Leases (Circular No. 2538). Additional requirements for the conduct of oil and gas operations can be found in the Code of Federal Regulations Title 43, Part 3160. Copies of Onshore Oil and Gas Order No. 1, and pertinent regulations, can be obtained from the BLM field offices in which the operations are proposed. Early coordination with these offices on proposals is encouraged.

**CULTURAL AND PALEONTOLOGICAL RESOURCES**--The SMA is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the SMA, shall:

1. Contact the appropriate SMA to determine if a site-specific cultural resource inventory is required. If an inventory is required, then:
2. Engage the services of a cultural resource specialist acceptable to the SMA to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the area of proposed disturbance to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.
3. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as testing salvage and recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited.

The operator shall immediately bring to the attention of the SMA any cultural or paleontological resources discovered as a result of approved operations under this lease, and not disturb such discoveries until directed to proceed by the SMA.

**ENDANGERED OR THREATENED SPECIES**--The SMA is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species, listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1973 by detrimentally affecting endangered or threatened species or their habitats.

The lessee/operator may, unless notified by the authorized officer of the SMA that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resources specialist approved by the SMA. An acceptable report must be provided to the SMA identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.

Standard 16-3  
*Lewistown Field Office*  
*North Dakota Field Office*  
*Malta Field Office*  
*Havre Field Office*  
*Glasgow Field Office*

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# Appendix K

GRSG Wildfire and Invasive Species Habitat  
Assessment



# **APPENDIX K**

## **GRSG WILDFIRE AND INVASIVE SPECIES**

### **HABITAT ASSESSMENT**

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The following process is a suggestion for a consistent approach in conducting an assessment of the GRSG habitat and wildfire threat at the local planning area level. Variations to this approach may be made based on interdisciplinary team discussion or unique issues in a given planning area. This example format is intended to portray the degree of specificity required for offices which will complete these assessments. Note that this process has similarities to watershed analysis and ecoregional assessments, and as such these documents may prove useful where they exist.

#### **INTRODUCTION**

Greater Sage-Grouse (GRSG) Wildfire and Invasive Species Habitat Assessments (hereafter referred to as “stepdown assessments”) are interdisciplinary evaluations of the threats posed by wildfire and invasive species, as well as identification of priority areas/treatment opportunities for fuels management, fire management, and restoration. Priority areas are spatial delineations where treatments, management actions, or other emphasis should be placed due to factors such as habitat quality, threats, or opportunities to protect, enhance, and restore GRSG habitat. The stepdown assessments will serve as a bridge between Resource Management Plans (RMP) and project level planning, and will position planning efforts to conduct project-scale National Environmental Policy Act analysis following RMP Records of Decision.

The stepdown assessment process involves four steps, beginning with characterization of the planning area and concluding with spatial delineation of priority areas. The content and methods used by the US Bureau of Land Management (BLM) in these documents should be consistent to ensure that priority areas are defined using similar criteria. These criteria and methods should be narratively described such that the US Fish and Wildlife Service (USFWS) and other audiences can understand the factors considered.

## **STEP 1: CHARACTERIZATION OF GREATER SAGE-GROUSE HABITAT**

The purpose of this step is to broadly establish context of the planning area and GRSG habitat.

### **Location and Spatial Extent**

- Describe the location of the planning area, and the relationship of GRSG habitat within the planning area.

### **Relationship to the Larger Scale Setting**

- How does the planning area lie within the larger context of GRSG habitat?

### **Quantifying Habitat within Planning Area**

- Brief description of GRSG habitat described in terms of acreage, habitat classes (e.g., Priority Habitat (PH), General Habitat (GH), and/or Priority Areas for Conservation [PAC]).
- Note: A summary map showing the planning area with habitat features is appropriate in Step 1. A tabular summary may also be included.

## **STEP 2: ISSUES AND KEY MANAGEMENT QUESTIONS**

The purpose of this step is to devise management questions related to the issues of fuels management, fire management, and restoration. Note that this step should not answer each management question. Rather, management questions are answered in Step 4 through specific, quantified data.

### **Overview**

- In coordination with state wildlife agencies, the USFWS, and your interdisciplinary team, develop an introductory section here which describes why fire or vegetation conditions pose a threat to GRSG in the local planning area. Describe where fire or vegetation conditions are a significant threat to GRSG habitat, and where fire, fuels, and restoration activities may help enhance habitat. In a brief paragraph or two, summarize the relationships between wildland fire, fuels management and invasives/restoration in the planning area. Examples would include annual grass/wildfire cycle, juniper encroachment into GRSG habitat, recently disturbed areas, etc.

### **Key Management Questions**

#### ***Issue #1: Fuels Management***

- In narrative format, develop management questions such as:
  - I. 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, PH, 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 PH, lek locations, and high burn probability.

6. How can fire management be coordinated across jurisdictional boundaries to reduce risk or to improve GRSG habitat?

**Issue #3: Restoration**

- In narrative format, develop management questions such as:
  1. Are there opportunities for restoration treatments to protect, enhance or maintain GRSG habitat? Assume that funding is not a constraint, and describe which sites are biologically suitable for restoration to GRSG habitat in a reasonable period.
  2. Considering the entire planning area, what are the site conditions, such as dominant vegetation, elevation, or precipitation zones, where restoration efforts have been proven to be most successful in the recent past? An example would be mountain sagebrush sites over 5,000' in elevation, and in a 16" or greater precipitation zone.
  3. What are the criteria for defining priority restoration areas? An example would be recent burns, moderately disturbed sites, or recovering allotment pastures which have not crossed ecological thresholds or become highly degraded. These may or may not be covered by existing emergency stabilization and restoration plans.
  4. Are there opportunities to utilize a coordinated approach across jurisdictional boundaries?

**STEP 3: CURRENT CONDITIONS AND TRENDS**

The purpose of this step is to develop information relevant to the issues and key questions identified in Step 2. It provides a snapshot of the present condition, statement of causal factors, and a summary of the trends which are occurring.

**Biological Summary of Vegetation, Invasive Species, and Fire Regimes**

[In this introductory section, provide a general biological summary of the planning area. Provide a narrative description of ecological trends, including description of plant communities, fire regimes, and other dominant biological factors affecting GRSG habitat.]

- Describe how fire has influenced current vegetation patterns. Are there large areas of even-aged communities, fine-scale mosaics, and annual grass monocultures?
- Describe if fire regimes are intact, or if they are altered. If they are altered, describe why. Use fire regime variables such as fire frequency, severity, or size to elucidate your points.

- Describe dominant cover types making up the planning area. These can be broad seral stage groupings, general life forms, or more fine-scale information such as plant associations, habitat types, or ecological systems. Note: this information should be available in the RMP.
- What has been the impact of fire exclusion (e.g., increased conifer encroachment, decadent shrub communities, etc.)?
- What is the current extent of annual grasses and other invasive species?
- What are the effects of invasive species on land health? On trends in plant succession? On fire regimes?

### **Fuels Management**

- Describe current fuels management practices within the planning area (what are the types of fuels treatments commonly applied to which management issues)?
- How has past fuels management influenced today's planning area (e.g., creation of mosaics, protecting certain features, increasing invasives, etc.)?
- What are causal factors which have created a need for fuels management practices?
- What are the trends in the fuels management program related to budget or capability?

### **Fire Management**

- Describe the current fire suppression workload.
- Describe fire occurrence trends (include discussion of fire size, numbers of starts, ignition locations).
- Describe causal factors influencing suppression effectiveness.
- Describe suppression capabilities. Discuss types and numbers of resources within office, through interagency agreements, and through resource sharing.

### **Restoration**

- Describe invasive species which are present in the planning area.
- Describe landscape conditions which may be suitable for restoration within the planning area, and the results of recent restoration efforts in the planning area.
- Describe invasive species occurrence.
- Describe causal factors influencing restoration needs.

**Methodology**

- What are the analysis methods to be utilized and analysis assumptions?

**Use of Best Available Science**

- Describe data sets used, such as the FSim layer, local data, etc. [Many data sets being used in RMPs will also be applicable to stepdown assessments].
- What are the elements of science used?

**STEP 4: IDENTIFICATION OF TREATMENT OPPORTUNITIES, PRIORITY AREAS, AND ACTIONS**

The purpose of this step is to utilize the information from steps 2 and 3 in order to quantify the overall need for treatment or other actions. Specifically, this step should spatially identify and quantify priority areas, using the criteria established in Step 2. Next, this step should identify treatment opportunities which fall within priority areas. Furthermore, treatments should be prioritized and an implementation schedule developed, reflecting the reality that not every acre in need of treatment can receive action within the planning horizon.

**Fuels Management**

- Spatially delineate priority areas for fuels management, based upon criteria established in Step 2. Fuels priority areas should be delineated by type, such as:
  - Linear fuel break along roads
  - Other linear fuel breaks to create anchor points
  - Prescribed burning
  - Mechanical (e.g., conifer removal)
  - Other mechanical, biological, or chemical treatment
- Quantify the number of acres of needed fuels treatments.
- If they exist, spatially delineate areas where fuel treatments would increase the ability to use fire to improve/enhance GRSG habitat.
  - Include tables, maps or appropriate information
- Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of fuels treatments.
- Quantify a projected level of treatment within fuels management priority areas.
- Identify treatments to be planned within fuels management priority areas.

- Include a priority or implementation schedule for proposed treatments.

### **Fire Management**

- Spatially delineate priority areas for fire suppression, based upon criteria established in Step 2. Priority areas for fire management should be delineated by type, such as:
  - Initial attack priority areas
  - Resource pre-positioning and movement priority areas
  - Remote station staffing priority areas, if appropriate
  - Include tables, maps or other supporting information
- Quantify the number of acres of GRSG habitats for aggressive initial attack that were identified at highest risk from losing key habitat components.
- Quantify the number and type of suppression resources that will be staged or otherwise pre-positioned, as well as the associated conditions, in order to enhance initial attack capabilities.
- Spatially delineate areas where opportunities exist to enhance or improve suppression capability.
  - Include tables, maps or other supporting information
- Spatially delineate areas where wildfire can be managed to achieve RMP objectives.
  - Include tables, maps or appropriate information
- Quantify the number of acres within fire management priority areas
- Include a priority or implementation schedule for fire suppression proposed actions.

### **Restoration**

- Spatially delineate priority areas for restoration, using criteria established in Step 2. Priority areas for restoration should be delineated by type, such as:
  - Seeding priority areas (aerial, drill, broadcast, or other)
  - Invasive species priority areas (herbicide, mechanical, biological, combination)
  - Priority areas requiring combinations of treatments (e.g., herbicide followed by seeding)
  - Include tables, maps or appropriate information
- Identify locations where post-fire restoration treatments should be focused.

- Include tables, maps or appropriate information
- Spatially identify invasive species occurrence
- Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of restoration treatments.
- Quantify the projected level of treatment within restoration priority areas.
- Identify treatments to be planned within restoration priority areas.
- Include a priority or implementation schedule for proposed restoration treatments.

**Annual Treatment Needs**

1. Based on the information above and within the planning area, what are the annual needs based on the key questions and summary statements?

**Annual Treatment Abilities**

1. Putting GRSG habitat protection and enhancement into perspective with other high valued resources and important land management goals, how does the annual need relate to capabilities?
2. What are the realistic annual expectations in fire management, fuels management, and restoration for the next five years?

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# Appendix L

Special Status Species Confirmed or Likely to  
Inhabit the Planning Area



# APPENDIX L

## SPECIAL STATUS SPECIES CONFIRMED OR LIKELY TO INHABIT THE PLANNING AREA

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Table L-1  
Special Status Species Confirmed or Likely to Inhabit the Planning Area

Common Name	Scientific Name	Status <sup>1</sup>	General Habitat	Likelihood of Occurrence
<b>Mammals</b>				
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	BLM S	Colonies are found on flat, open grasslands and shrub/grasslands with low, relatively sparse vegetation. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama, and big sagebrush. Colonies are associated with silty clay loams, sandy clay loams, and loams and fine to medium textured soils are preferred, presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils.	Documented
Fringed myotis	<i>Myotis thysanodes</i>	BLM S	Rocky outcroppings in mid-elevation ponderosa pine, piñon/juniper, oak, and mixed conifer woodlands, grasslands, deserts, and shrublands.	Documented

**Table L-1**  
**Special Status Species Confirmed or Likely to Inhabit the Planning Area**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status<sup>1</sup></b>	<b>General Habitat</b>	<b>Likelihood of Occurrence</b>
Fringe-tailed myotis	<i>Myotis thysanodes pahasapensis</i>	BLM S	Occurs primarily in caves in the Black Hills and Badlands. Occurs only in certain montane (mountainous) areas of South Dakota and Wyoming.	Documented
Gray wolf	<i>Canis lupis</i>	BLM S	No particular habitat preference except for the presence of native ungulates within its territory on a year-round basis. Gray wolves establishing new packs in Montana have demonstrated greater tolerance of human presence and disturbance than previously thought characteristic of this species.	Documented
Long-eared myotis	<i>Myotis evotis</i>	BLM S	Found in wooded and rocky areas. It has been located hibernating in mines and in riverbreaks habitat in northeastern Montana.	Documented
Long-legged myotis	<i>Myotis volans</i>	BLM S	Typically occupy mountainous or relatively rugged areas. They often live in coniferous forest, although they are sometimes found in oak or streamside woodlands, and even deserts. They feed mostly on moths, but are opportunistic, eating whatever soft-bodied insects are most abundant.	Documented
Swift fox	<i>Vulpes velox</i>	BLM S	Typically occupy open prairie and arid plains, including areas intermixed with winter wheat fields in north-central Montana. They use burrows when they are inactive; either dug by themselves or made by other mammals (marmot, prairie dog, badger). The burrows are usually located in sandy soil on high ground such as hill tops in open prairies, along fencerows, or occasionally in a plowed field. Suitable habitat generally extensive in size (preferably over 100,000 acres), with relatively level topography, and with greater than 50% of the area undisturbed by agriculture. A total of 8,000,000 suitable acres were identified in Montana.	Documented
Townsend's big-eared bat	<i>Plecotus townsendii</i>	BLM S	Associated with caves and abandoned mines for day roosts and hibernacula. Will also use abandoned buildings in western shrubland, piñon/juniper woodlands, and open montane forests in elevations up to 9,500 feet.	Documented

**Table L-1**  
**Special Status Species Confirmed or Likely to Inhabit the Planning Area**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status<sup>1</sup></b>	<b>General Habitat</b>	<b>Likelihood of Occurrence</b>
<b>Birds</b>				
Baird's sparrow	<i>Ammodramus bairdii</i>	BLM S	Nest in native prairie, but structure may ultimately be more important than plant species composition. Nesting has been observed in crested wheat, while smooth brome is avoided. Areas with little to no grazing activity are required.	Documented
Bald eagle	<i>Haliaeetus leucocephalus</i>	BLM S	Found near open water including rivers, streams and lakes, nesting and roosting in large ponderosa pine, Douglas-fir, or cottonwood trees in proximity to open water and rivers.	Documented
Black tern	<i>Chilodoniass niger</i>	BLM S	Wetlands, marshes, prairie potholes, and small ponds. 30%-50% of the wetland complex is emergent vegetation. Vegetation within known breeding colonies includes alkali bulrushes, canary reed-grass, cattail spp., sedge spp., rush spp., reed spp., grass spp., <i>Polygonum</i> spp., <i>Juncus</i> spp. and <i>Potamogeton</i> spp., indicating a wide variety of potential habitats are usable by Black Terns. Water levels range from about 0.5 meter to greater than 2.0 meter with most having depths between 0.5 meter and 1.0 meter.	Documented
Black-crowned night heron	<i>Nycticorax nycticorax</i>	BLM S	Shallow bulrush or cattail marshes, most often within a grassland landscape. Also nest in cottonwoods, willows, or other wetland vegetation that allows them to nest over water or on islands that may afford them protection from mammalian Most colonies are located in large wetland complexes, typically with a one-to-one ratio of open water and emergent vegetation.	Documented
Bobolink	<i>Dolichonyx orysivorus</i>	BLM S	Nests built in tall grass and mixed-grass prairies. Prefers "old" hay fields with high grass-to-legume ratios.	Documented
Brewer's sparrow	<i>Spizella breweri</i>	BLM S	Sagebrush, mountain meadows, and mountain shrub habitats. Nested in sagebrush averaging 16-inches high. The cover (concealment) for the nest provided by sagebrush is very important.	Documented

**Table L-1**  
**Special Status Species Confirmed or Likely to Inhabit the Planning Area**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status<sup>1</sup></b>	<b>General Habitat</b>	<b>Likelihood of Occurrence</b>
Burrowing owl	<i>Athene cunicularia</i>	BLM S	Open grasslands, where abandoned burrows dug by mammals such as ground squirrels, prairie dogs, and badgers are available. Black-tailed prairie dog and Richardson's ground squirrel colonies provide the primary and secondary habitat for burrowing owls in the state.	Documented
Chestnut-collared longspur	<i>Calcarius ornatus</i>	BLM S	Species prefers short-to-medium grasses that have been recently grazed or mowed. Prefers native pastures.	Documented
Dickcissel	<i>Spiza americana</i>	BLM S	Grasslands, meadows, savanna, cultivated lands, and brushy fields. Nest on ground in grass or rank herbage, or raised a little above ground, in grass tufts or tall weeds, or in low shrubs or trees, up to about 2 meters above the ground but usually low. Prefer habitat with dense, moderate to tall vegetation (particularly with some forbs) and moderately deep litter. Moderately grazed and idle prairie. A high abundance of forbs provides perches, nesting cover, nest support, and possibly increased invertebrate abundance.	Documented
Ferruginous hawk	<i>Buteo regalis</i>	BLM S	Mixed-grass prairie, shrub-grasslands, grasslands, grass-sagebrush complex, and sagebrush steppe.	Documented
Franklin's gull	<i>Larus pipixcan</i>	BLM S	Preferring large, relatively permanent prairie marsh complexes. Builds its nests over water on a supporting structure of emergent vegetation. Nesting is noted to occur in cattails and bulrushes.	Documented
Golden eagle	<i>Aquila chrysaetos</i>	BLM S	Nest on cliffs and in large trees (occasionally on power poles), and hunt over prairie and open woodlands. Cliff nests selected for south or east aspect, less than 200 inches snowfall, low elevation, availability of sagebrush/grassland hunting areas	Documented
Greater Sage-Grouse	<i>Centrocercus urophasianus</i>	BLM S/FC	Tall dense stands of sagebrush; 6 to 18 inch high sagebrush covered benches in June to July (average 213 acres); move to alfalfa fields (144 acres) or greasewood bottoms (91 acres) when forbs on the benches dry out; and move back to sagebrush (average 128 acres) in late August to early September.	Documented

**Table L-1**  
**Special Status Species Confirmed or Likely to Inhabit the Planning Area**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status<sup>1</sup></b>	<b>General Habitat</b>	<b>Likelihood of Occurrence</b>
Least tern	<i>Sternula antillarum</i>	FE	Nest on unvegetated sand-pebble beaches and islands of large reservoirs and rivers in northeastern and southeastern Montana, specifically the Yellowstone and Missouri river systems.	Documented
Loggerhead shrike	<i>Lanius ludovicianus</i>	BLM S	Open riparian areas, montane meadows, agricultural areas, grasslands, shrublands, and piñon/juniper woodlands.	Documented
Long-billed curlew	<i>Numenius americanus</i>	BLM S	Nests primarily in short-grass or mixed-prairie habitat with flat to rolling topography Habitats with trees, high density of shrubs (e.g., sagebrush [ <i>Artemisia</i> spp.]), and tall, dense grass generally. Taller, denser grass used during brood-rearing when shade and camouflage from predators are presumably more important for chicks, but may also reflect decline in availability of shorter habitats with season.	Documented
Marbled godwit	<i>Limosa fedoa</i>	BLM S	Breeds in short, sparsely to moderately vegetated landscapes that include native grassland and wetlands. Ephemeral ponds, as well as temporary ponds and alkali wetland. Semi-permanent ponds used as well. Upland habitat during breeding season primarily idle grassland and pastures.	Documented
McCown's longspur	<i>Calcarius mccownii</i>	BLM S	Breeding habitat is a matrix of perennial shortgrass species (e.g., <i>Bouteloua gracilis</i> , <i>Buchloe dactyloides</i> ) interspersed with cactus, and limited cover of midgrasses (e.g., <i>Aristida longiseta</i> , <i>Agropyron smithii</i> , <i>Stipa comata</i> ) and shrubs (e.g., <i>Gutierrezia sarothrae</i> , <i>Chrysothamnus nauseosus</i> , <i>Artemesia frigida</i> ).	Documented
Mountain plover	<i>Charadrius montanus</i>	BLM S	Prairie dog colonies and other shortgrass prairie sites are confirmed as preferred breeding habitat. Strong preference was also given to sites with slopes less than 5% and grass height of less than 3 inches.	Documented
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	BLM S	Along major rivers having riparian forest. Open savannah country w/ ground cover, snags and canopy cover. Large burns also utilized. Nest in holes excavated 2 to 25 meters above ground by both sexes in live trees, dead stubs, utility poles, or fence posts. Individuals nest in the same cavity in successive years.	Documented

**Table L-1**  
**Special Status Species Confirmed or Likely to Inhabit the Planning Area**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status<sup>1</sup></b>	<b>General Habitat</b>	<b>Likelihood of Occurrence</b>
Sage sparrow	<i>Amphispiza belli</i>	BLM S	Prefers semi-open habitats with evenly spaced shrubs 1–2 meters high. Vertical structure, habitat patchiness, and vegetation density may be more important in habitat selection than specific shrub species, but this sparrow is closely associated with big sagebrush throughout most of its range. Historical records with in planning area 20+ years old. Extreme south central Montana.	Documented
Sage thrasher	<i>Oreoscoptes montanus</i>	BLM S	Sagebrush obligate in Montana. Abundance is generally positively correlated with the amount of sage cover and negatively correlated with grass cover.	Documented
Sprague's pipit	<i>Anthus spragueii</i>	BLM S/FC	Native, medium to intermediate height prairie and in a short grass prairie landscape, can often be found in areas with taller grasses. More abundant in native prairie than in exotic vegetation; area sensitive, requiring relatively large areas of appropriate habitat; the minimum area requirement in a Saskatchewan study was 470 acres. Known to utilize and breed in alkaline meadows and around the edges of alkaline lakes.	Documented
Swainson's hawk	<i>Buteo swainsoni</i>	BLM S	Nest in river bottom forests, brushy coulees, and shelterbelts. Hunt in grasslands and agricultural land, especially along river bottoms.	Documented
White-faced ibis	<i>Plegadis chihi</i>	BLM S	Freshwater wetlands, including ponds, swamps and marshes with pockets of emergent vegetation. Also use flooded hay meadows and agricultural fields as feeding locations. Nest in areas where water surrounds emergent vegetation, bushes, shrubs, or low trees. Use old stems in cattails ( <i>Typha</i> spp.), hardstem bulrush ( <i>Scirpus acutus</i> ) or alkali bulrush ( <i>S. paludosus</i> ) over shallow water as their nesting habitat.	Documented

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<b>Reptiles</b>				
Greater short-horned lizard	<i>Phrynosoma hernandesi</i>	BLM S	Ridge crests between coulees, and in sparse, short grass and sagebrush with sun-baked soil. Limestone outcrops in canyon bottoms of sandy soil with an open canopy of limber pine-Utah juniper, and are also present on flats of relatively pebbly or stony soil with sparse grass and sagebrush cover.	Documented
Milk snake	<i>Lampropeltis triangulum</i>	BLM S	Open sagebrush-grassland habitat and ponderosa pine savannah with sandy soils, most often in or near areas of rocky outcrops and hillsides or badland scarps, sometimes within city limits.	Documented
Snapping turtle	<i>Chelydra serpentina</i>	BLM S	Backwaters along major rivers, at smaller reservoirs, and in smaller streams and creeks with permanent flowing water and sandy or muddy bottoms.	Documented
Western hog-nosed snake	<i>Heterodon nasicus</i>	BLM S	Apparent preference for arid areas, farmlands, and floodplains, particularly those with gravelly or sandy soil, has been noted. They occupy burrows or dig into soil, and less often are found under rocks or debris, during periods of inactivity.	Documented
<b>Amphibians</b>				
Great Plains toad	<i>Bufo cognatus</i>	BLM S	Sagebrush-grassland, rainwater pools in road ruts, in stream valleys, at small reservoirs and stock ponds, and around rural farms; breeding has been documented in small reservoirs and backwater sites along streams. Appears to prefer stock tanks and roadside ponds rather than floodplains. Eggs and larvae develop in shallow water, usually clear or slightly turbid, but not muddy.	Documented
Northern leopard frog	<i>Lithobates pipiens</i>	BLM S	Wetland habitats of relatively fresh water with moderate salinity, including springs, slow streams, marshes, bogs, ponds, canals, flood plains, beaver ponds, reservoirs, and lakes, usually in permanent water with rooted aquatic vegetation.	Documented

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<b>Common Name</b>	<b>Scientific Name</b>	<b>Status<sup>1</sup></b>	<b>General Habitat</b>	<b>Likelihood of Occurrence</b>
Plains spadefoot	<i>Spea bombifrons</i>	BLM S	Soft sandy/gravelly soils near permanent or temporary bodies of water. Lives largely inactive in its burrows or occupies rodent burrows, and enters water only to breed. Following heavy rains, adults have been reported in water up to 30 centimeters deep in flooded wagon wheel ruts, temporary rain pools formed in wide flat-bottom coulees, water tanks, and badland seep ponds. Tadpoles and toadlets have been observed in stock ponds and small ephemeral reservoirs, usually in sagebrush-grassland habitats.	Documented
Western toad	<i>Anaxyrus boreas boreas</i>	BLM S	Utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms.	Documented
<b>Plants</b>				
Little Indian Breadroot	<i>Pediomelum hypogaeum</i>	BLM S	Grasslands/woodlands (open sandy soil).	Documented
Platte Cinquefoil	<i>Potentilla plattensis</i>	BLM S	Grasslands/sage brush (Mesic).	Documented

Source:

- Montana/Dakotas Special Status Species List. Instruction Memorandum No. MT-2009-039 (Accessed April 24, 2009). [http://www.blm.gov/mt/st/en/res/public\\_room/efoia/2009/IMs/09mtm039.html](http://www.blm.gov/mt/st/en/res/public_room/efoia/2009/IMs/09mtm039.html); USFWS 2012.
- Endangered, Threatened, Proposed and Candidate Species Montana Counties. Ecological Services Montana Field Office (Accessed August 21, 2012). [http://www.fws.gov/montanafieldoffice/Endangered\\_Species/Listed\\_Species.html](http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species.html)

<sup>1</sup>FE – Federally listed as endangered; FT – Federally listed as threatened; FC – Federal listed as a candidate species; FC (w) – Federal candidate species warranted for listing; SE – State listed as endangered; ST – State listed as threatened; SC – State listed as species of special concern (no legal status); BLM S – BLM Sensitive; FS –Forest Service Sensitive