BLM

Oregon Sub-Region Greater Sage-Grouse Draft Resource Management Plan Amendment and Environmental Impact Statement

Volume III

US Department of the Interior
Bureau of Land Management

November 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/OR/WA/PL-14/004+1792

Cover Photo: Steve Ting

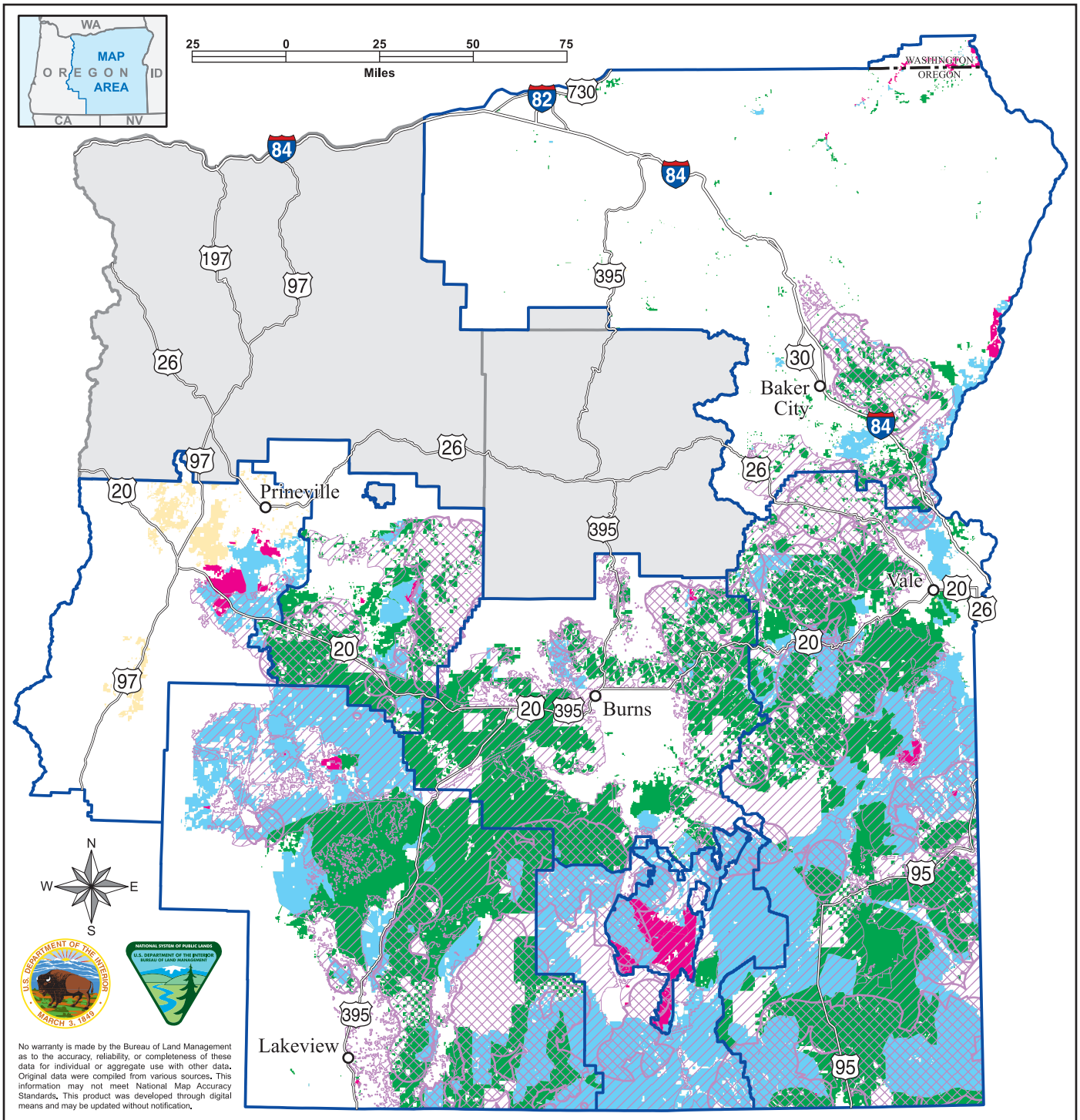
Appendix A

Chapter 2 Figures

APPENDIX A
CHAPTER 2 FIGURES

Figure 2-3 Off-Highway Vehicle Designations in the Planning Area Alternative A (No Action)
Figure 2-4 Off-Highway Vehicle Designations in the Planning Area Alternative B
Figure 2-5 Off-Highway Vehicle Designations in the Planning Area Alternative C
Figure 2-6 Off-Highway Vehicle Designations in the Planning Area Alternative E
Figure 2-7 Right-of-Way Designations in the Planning Area Alternative A (No Action)
Figure 2-8 Right-of-Way Designations in the Planning Area Alternative B
Figure 2-9 Right-of-Way Designations in the Planning Area Alternative C
Figure 2-10 Right-of-Way Designations in the Planning Area Alternative D
Figure 2-11 Right-of-Way Designations in the Planning Area Alternative E
Figure 2-12 Right-of-Way Designations in the Planning Area Alternative F
Figure 2-13 Land Tenure Zones in the Planning Area Alternative A (No Action)
Figure 2-14 Land Tenure Zones in the Planning Area Alternatives B, D, and F
Figure 2-15 Land Tenure Zones in the Planning Area Alternative C
Figure 2-16 Areas of Critical Environmental Concern in the Planning Area Alternative A (No Action), B, D, and E
Figure 2-17 Areas of Critical Environmental Concern in the Planning Area Alternative C
Figure 2-18 Areas of Critical Environmental Concern in the Planning Area Alternative F
Figure 2-19 Fluid Mineral Leasing in the Planning Area Alternative A (No Action)
Figure 2-20 Fluid Mineral Leasing in the Planning Area Alternative B
Figure 2-21 Fluid Mineral Leasing in the Planning Area Alternative C
Figure 2-22 Fluid Mineral Leasing in the Planning Area Alternative D
Figure 2-23 Fluid Mineral Leasing in the Planning Area Alternative E
Figure 2-24 Fluid Mineral Leasing in the Planning Area Alternative F
Figure 2-25 Locatable Mineral Entry in the Planning Area Alternative A (No Action)
Figure 2-26 Locatable Mineral Entry in the Planning Area Alternatives B and F
Figure 2-27 Locatable Mineral Entry in the Planning Area Alternative C
Figure 2-28 Locatable Mineral Entry in the Planning Area Alternative D
Figure 2-29 Locatable Mineral Entry in the Planning Area Alternative E
Figure 2-30 Mineral Materials Disposal in the Planning Area Alternative A (No Action)
Figure 2-31 Mineral Materials Disposal in the Planning Area Alternatives B and F

Figure 2-32 Mineral Materials Disposal in the Planning Area Alternative C
Figure 2-33 Mineral Materials Disposal in the Planning Area Alternative D
Figure 2-34 Mineral Materials Disposal in the Planning Area Alternative E



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

- Preliminary Priority Habitat
- Preliminary General Habitat
- Other BLM Administered Land

Off-Highway Vehicle Designations

- Closed- *Off-road use is prohibited*
- Limited- *Vehicle use only on designated roads and trails with possible additional time or vehicle restrictions*
- Open- *All types of vehicle use is permitted at all times anywhere in the area, subject to operating regulations and vehicle standards*

Figure 2-3: Off-Highway Vehicle Designations in the Planning Area Alternative A (No Action)

M11-11-04

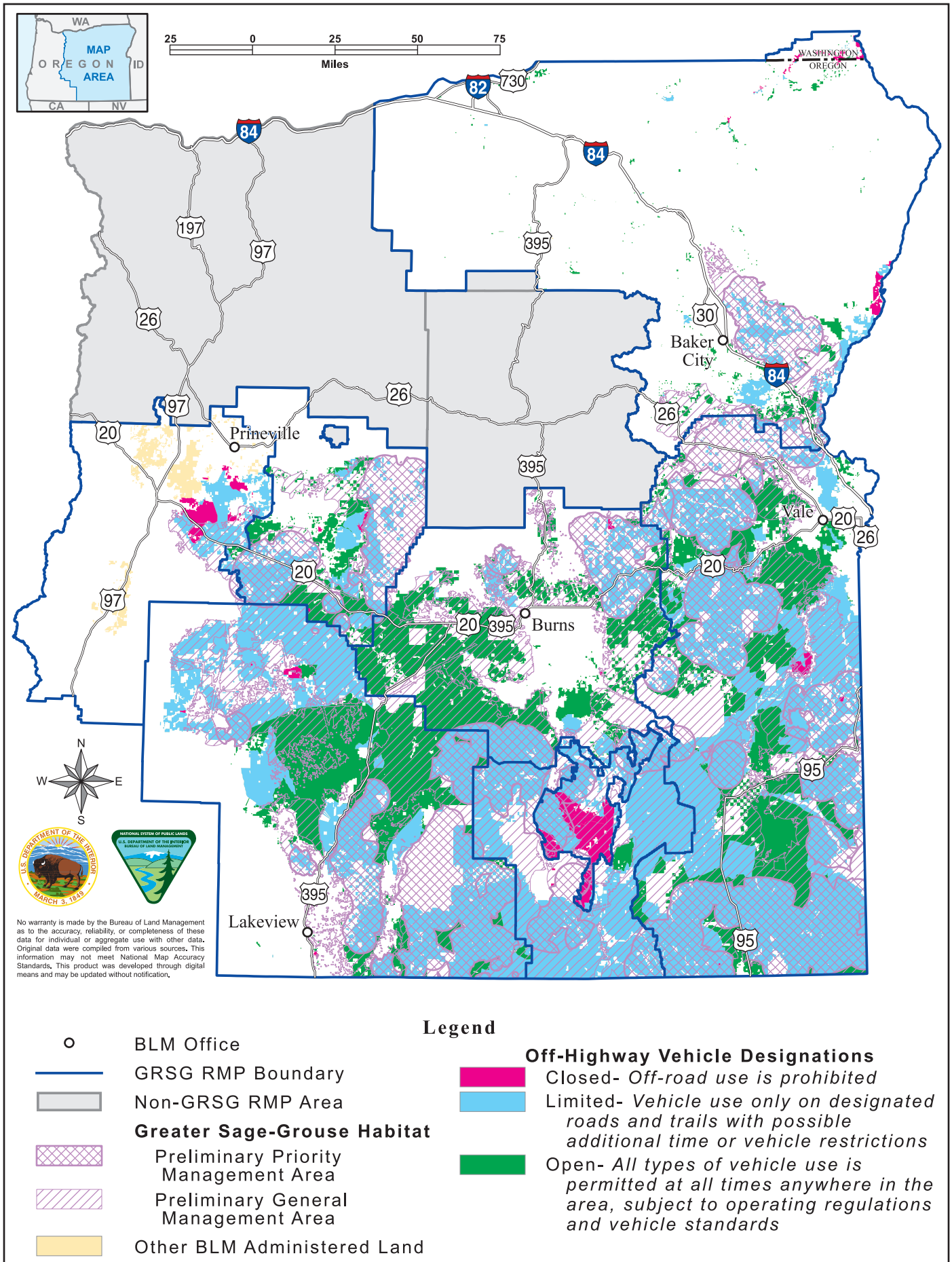
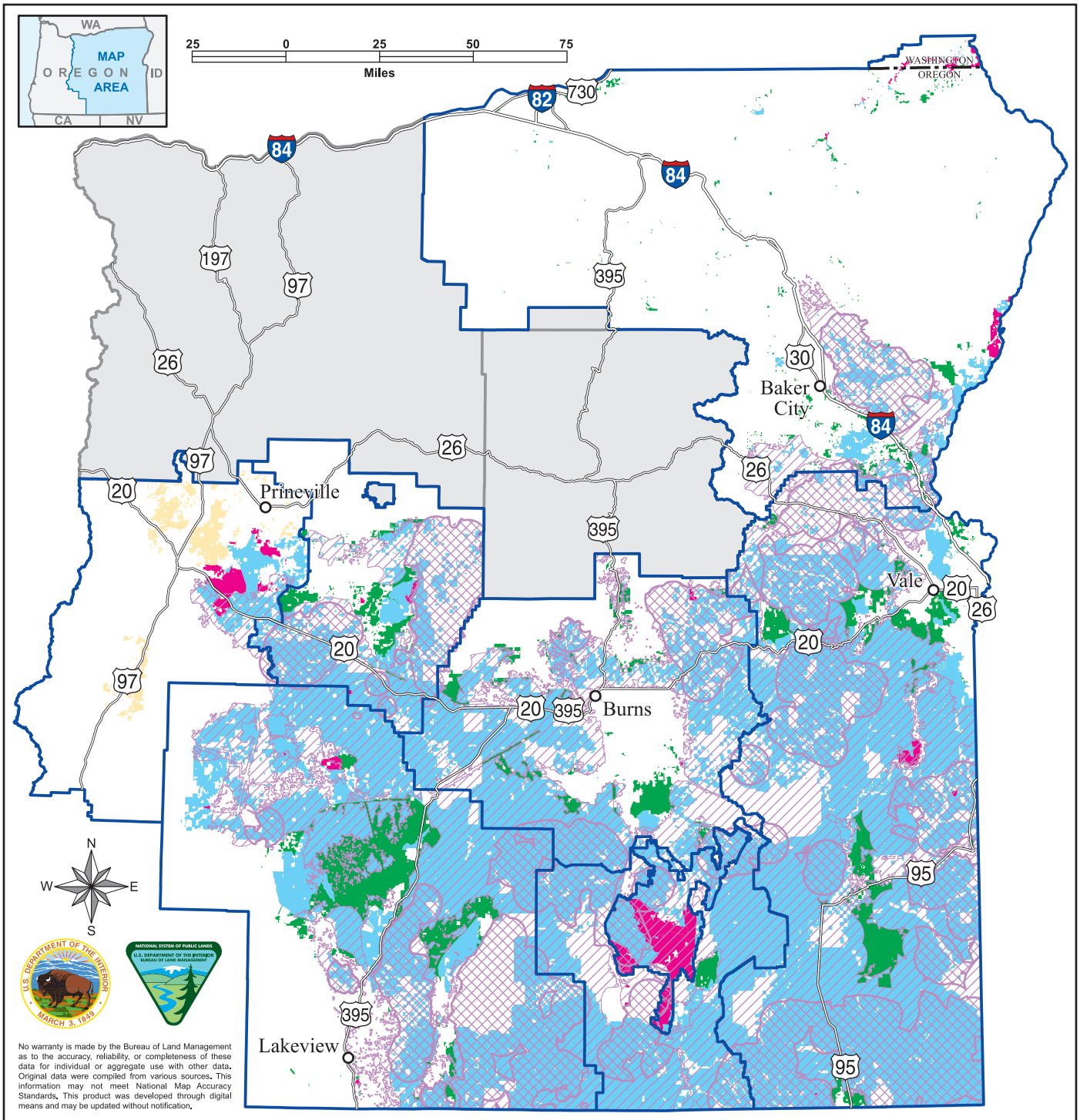


Figure 2-4: Off-Highway Vehicle Designations in the Planning Area Alternative B

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

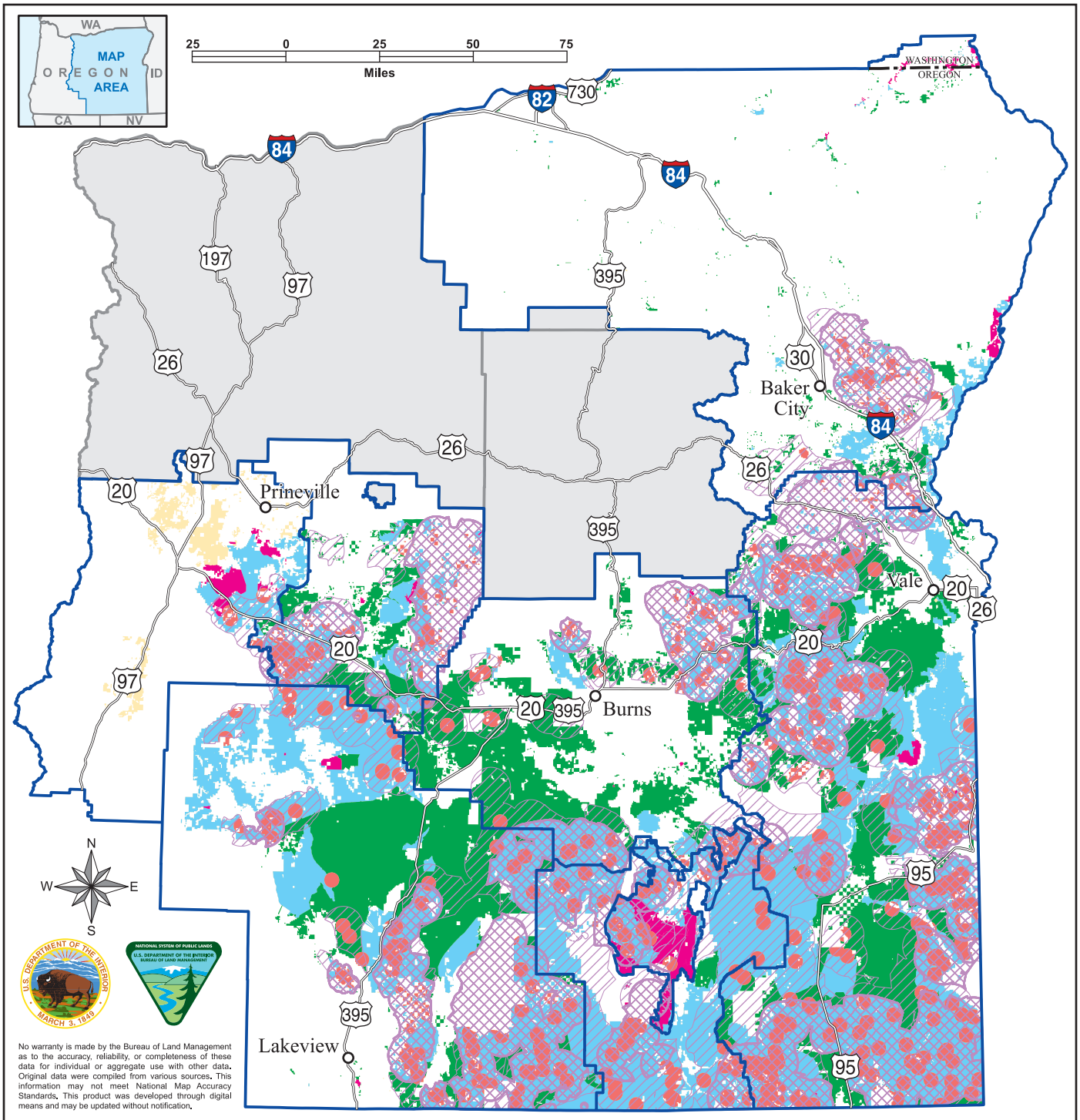
- Preliminary Priority Habitat
- Preliminary General Habitat
- Other BLM Administered Land

Off-Highway Vehicle Designations

- Closed- *Off-road use is prohibited*
- Limited- *Vehicle use only on designated roads and trails with possible additional time or vehicle restrictions*
- Open- *All types of vehicle use is permitted at all times anywhere in the area, subject to operating regulations and vehicle standards*

Figure 2-5: Off-Highway Vehicle Designations in the Planning Area Alternative C

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area
- **Greater Sage-Grouse Habitat**
  - Core Area
  - Low Density
- Other BLM Administered Land

Off-Highway Vehicle Designations

- Closed- *Off-road use is prohibited*
- Seasonally Closed
- Limited- *Vehicle use only on designated roads and trails with possible additional time or vehicle restrictions*
- Open- *All types of vehicle use is permitted at all times anywhere in the area, subject to operating regulations and vehicle standards*

Figure 2-6: Off-Highway Vehicle Designations in the Planning Area Alternative E

M11-11-04

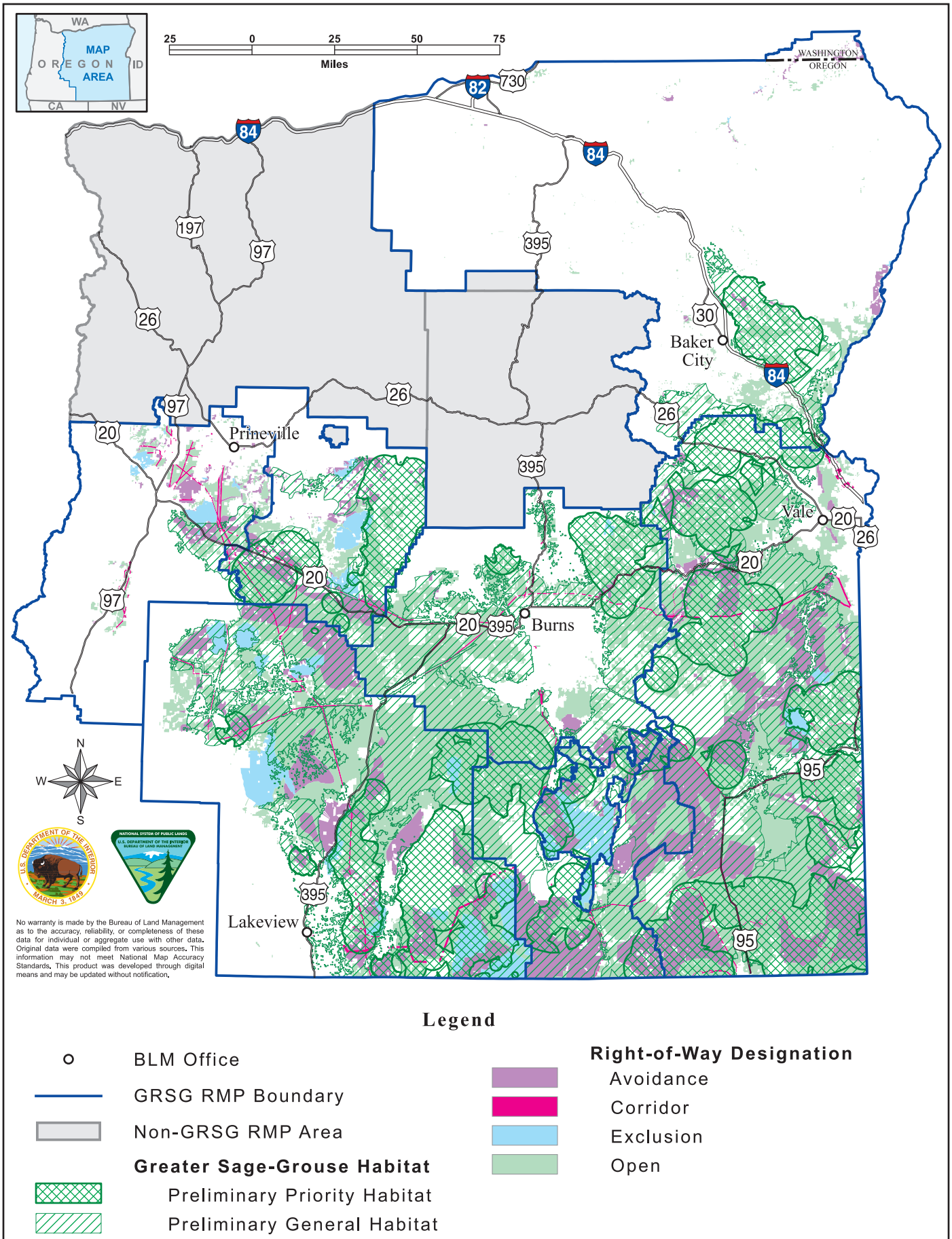


Figure 2-7: Right-of-Way Designations in the Planning Area Alternative A (No Action)

M11-11-04

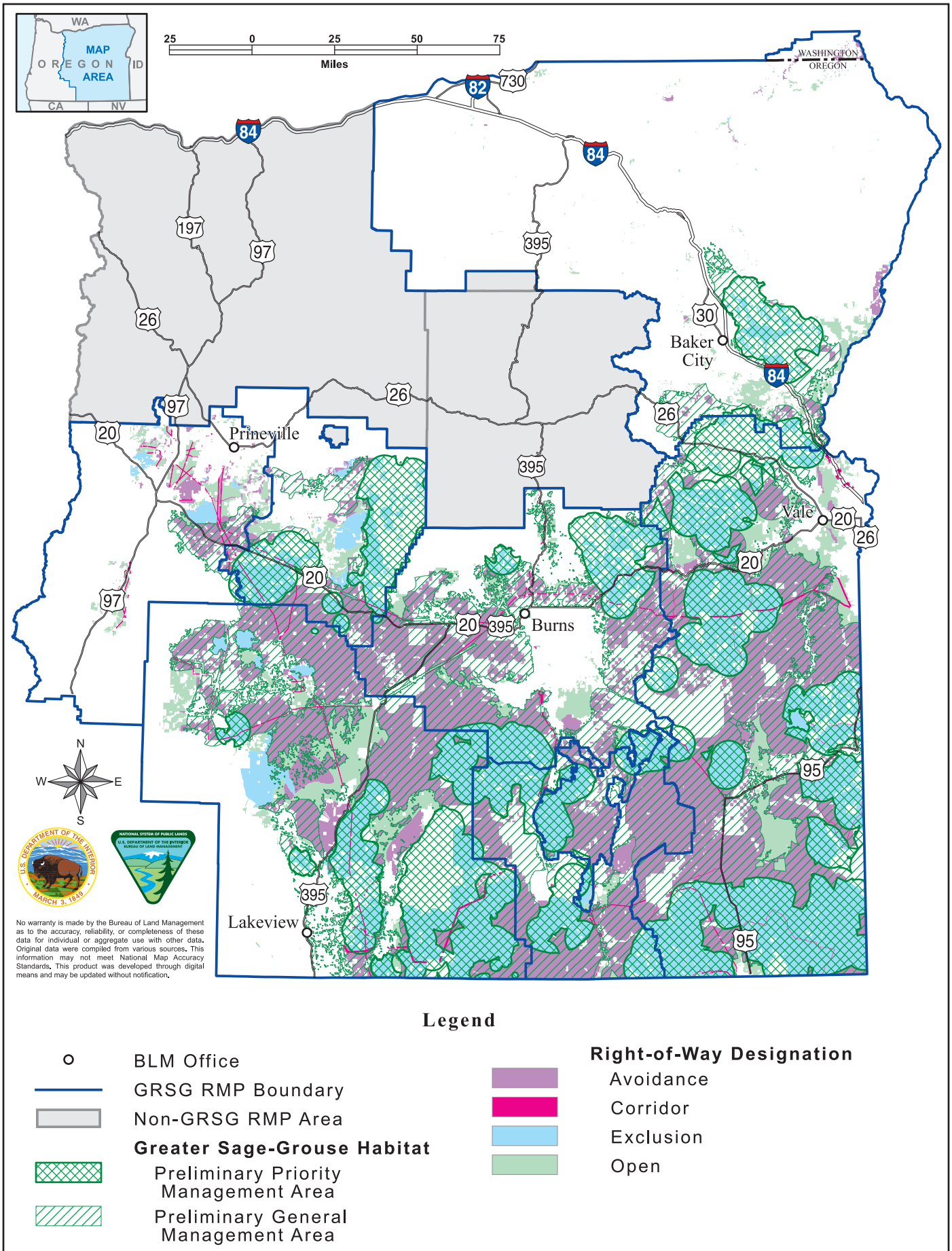


Figure 2-8: Right-of-Way Designations in the Planning Area Alternative B

M11-11-04

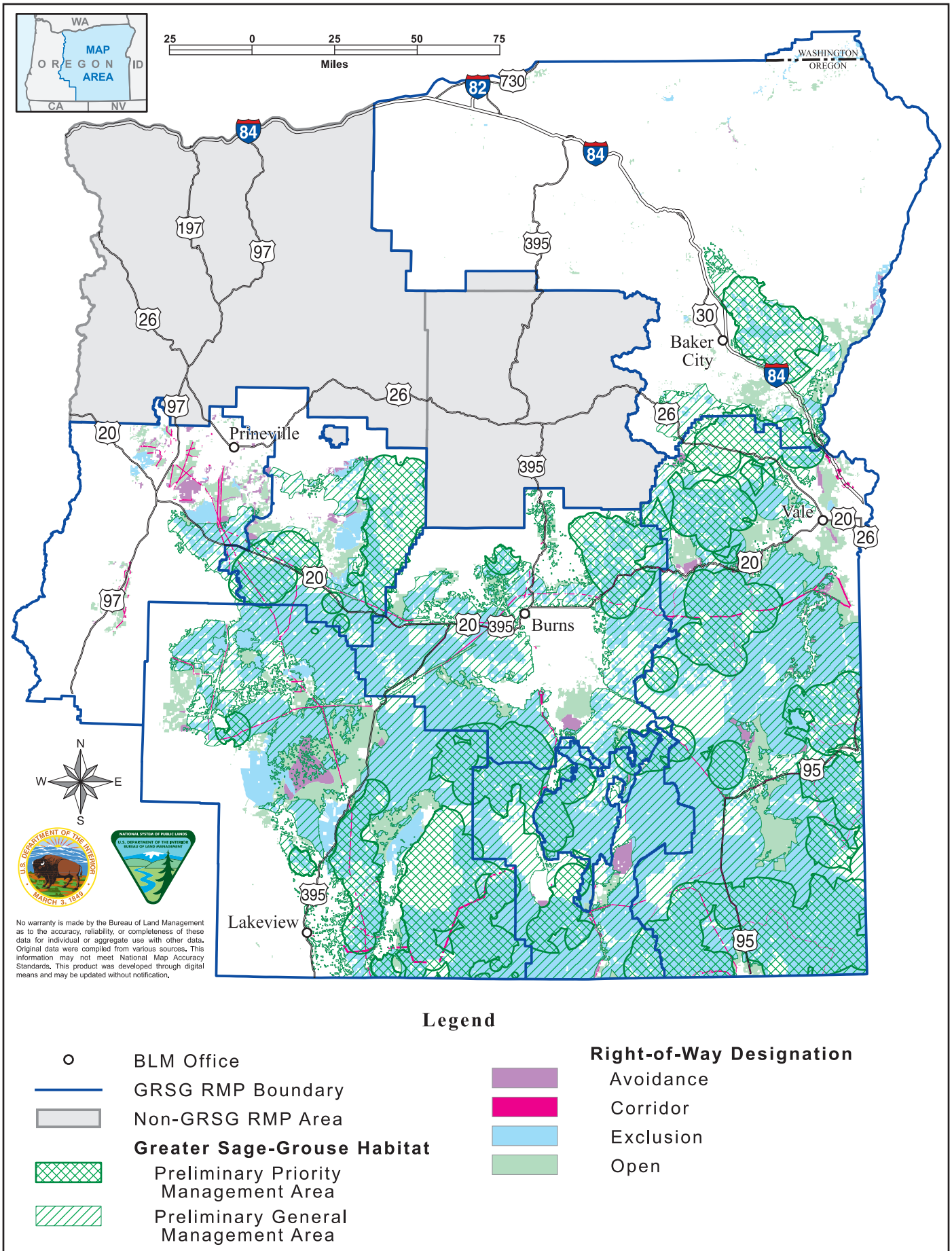


Figure 2-9: Right-of-Way Designations in the Planning Area Alternative C

M11-11-04

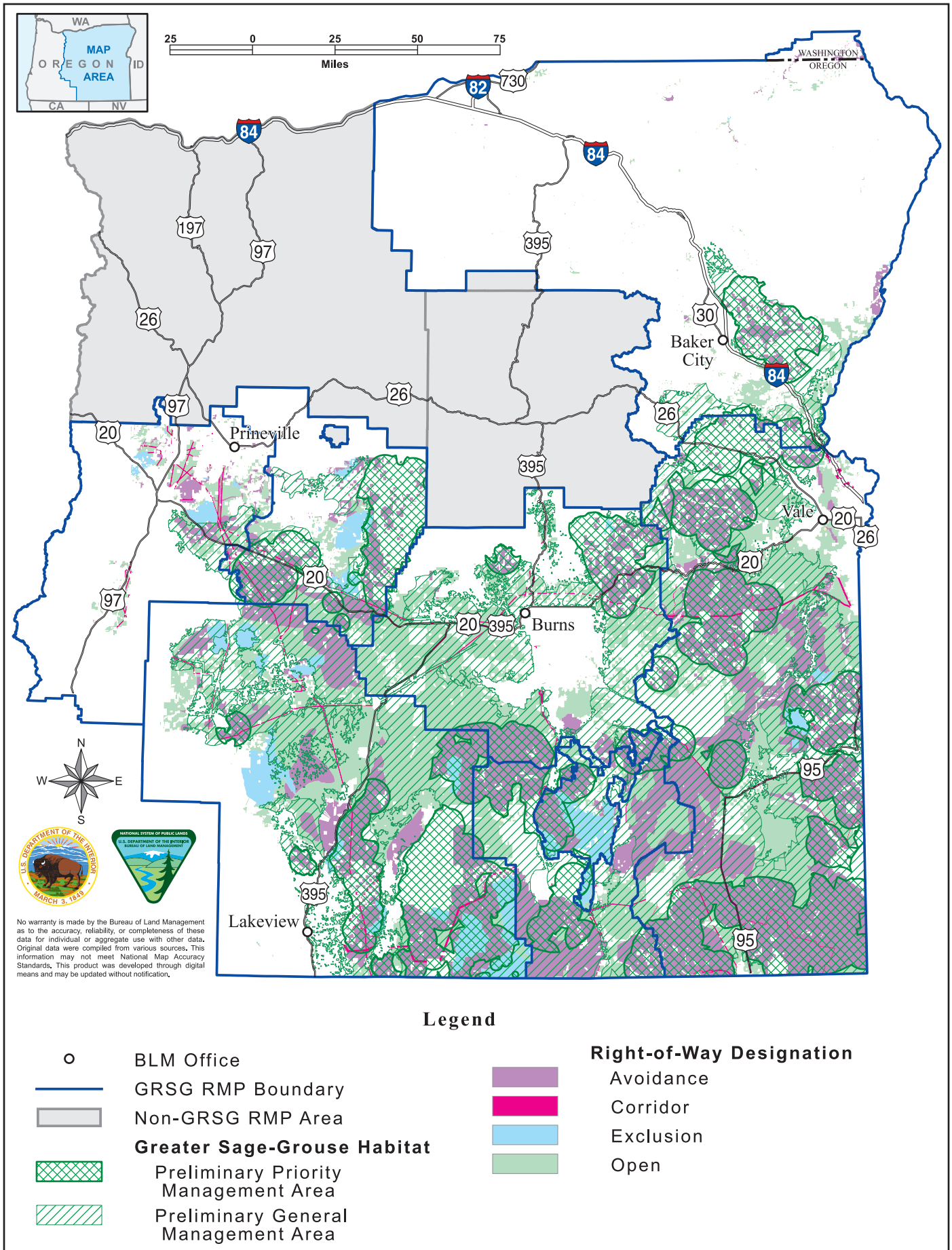


Figure 2-10: Right-of-Way Designations in the Planning Area Alternative D

M11-11-04

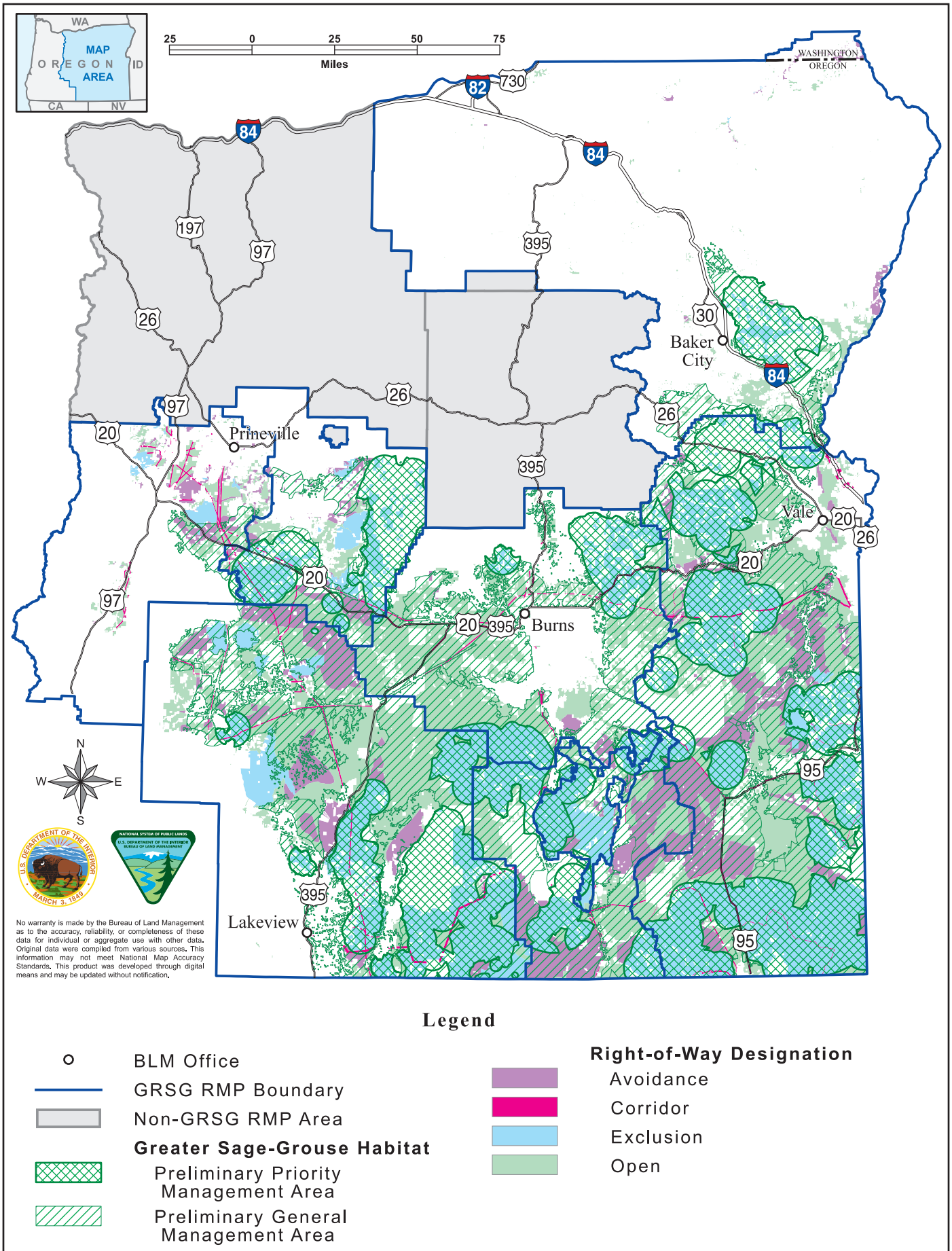


Figure 2-11: Right-of-Way Designations in the Planning Area Alternative E

M11-11-04

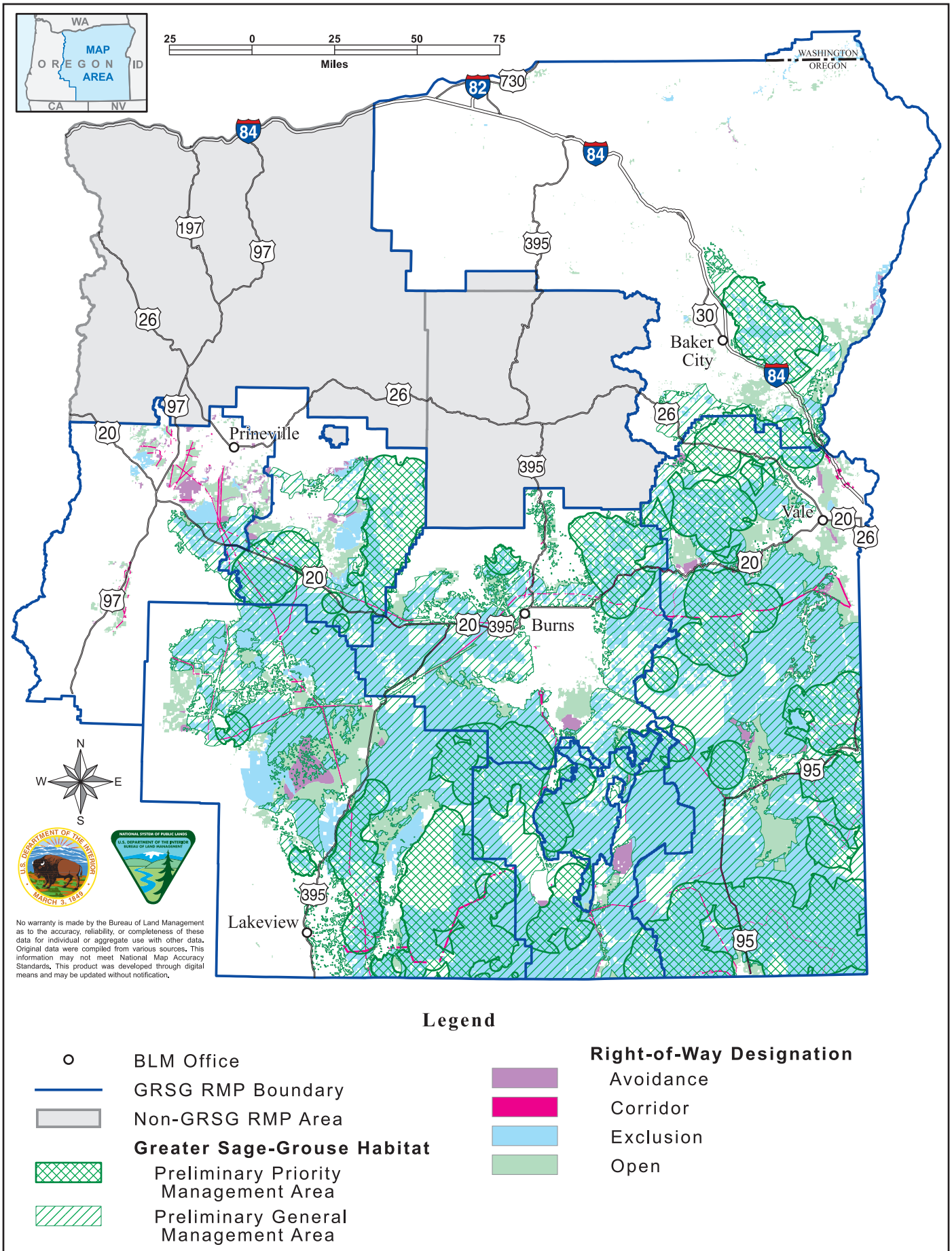
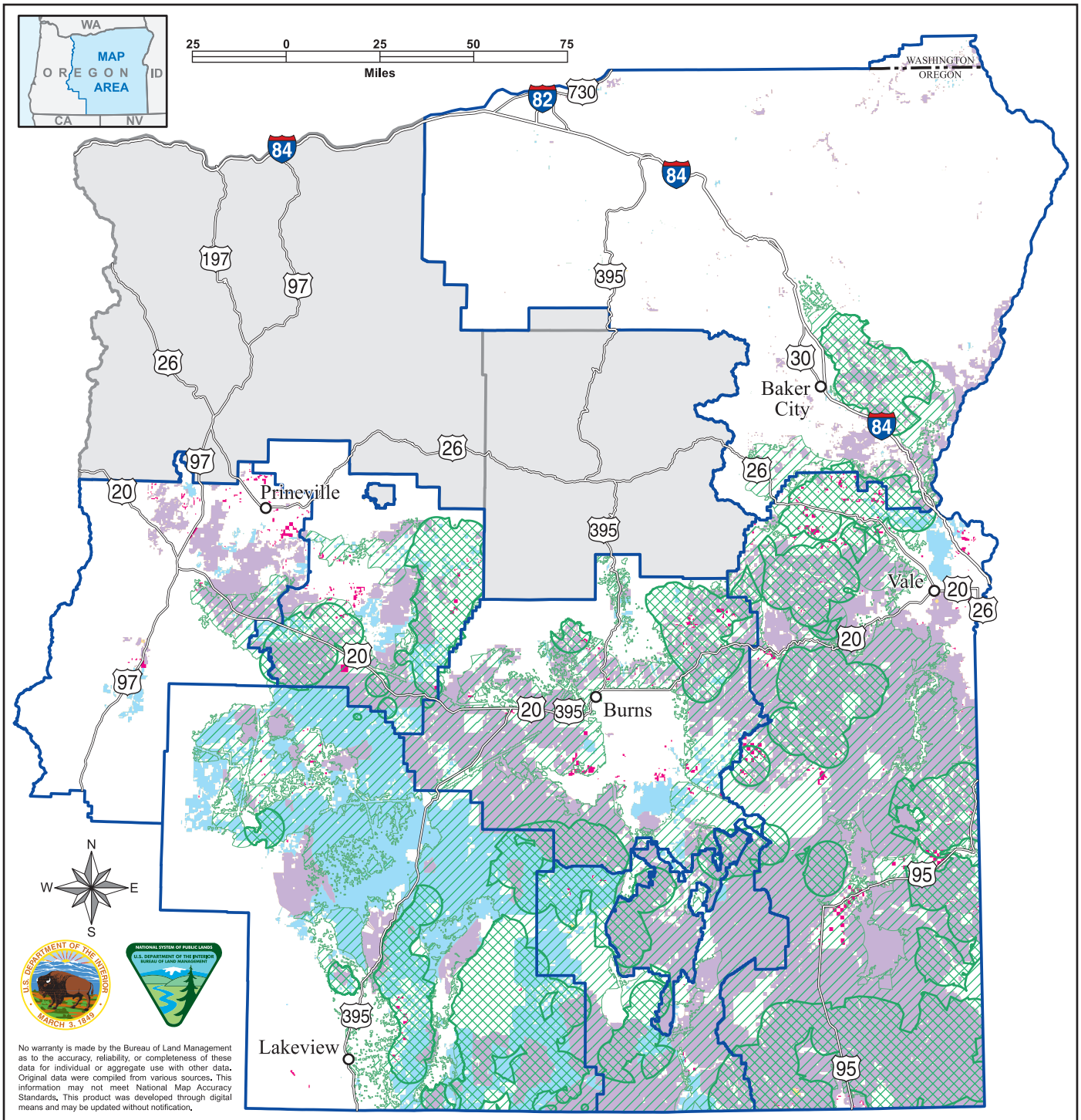


Figure 2-12: Right-of-Way Designations in the Planning Area Alternative F

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

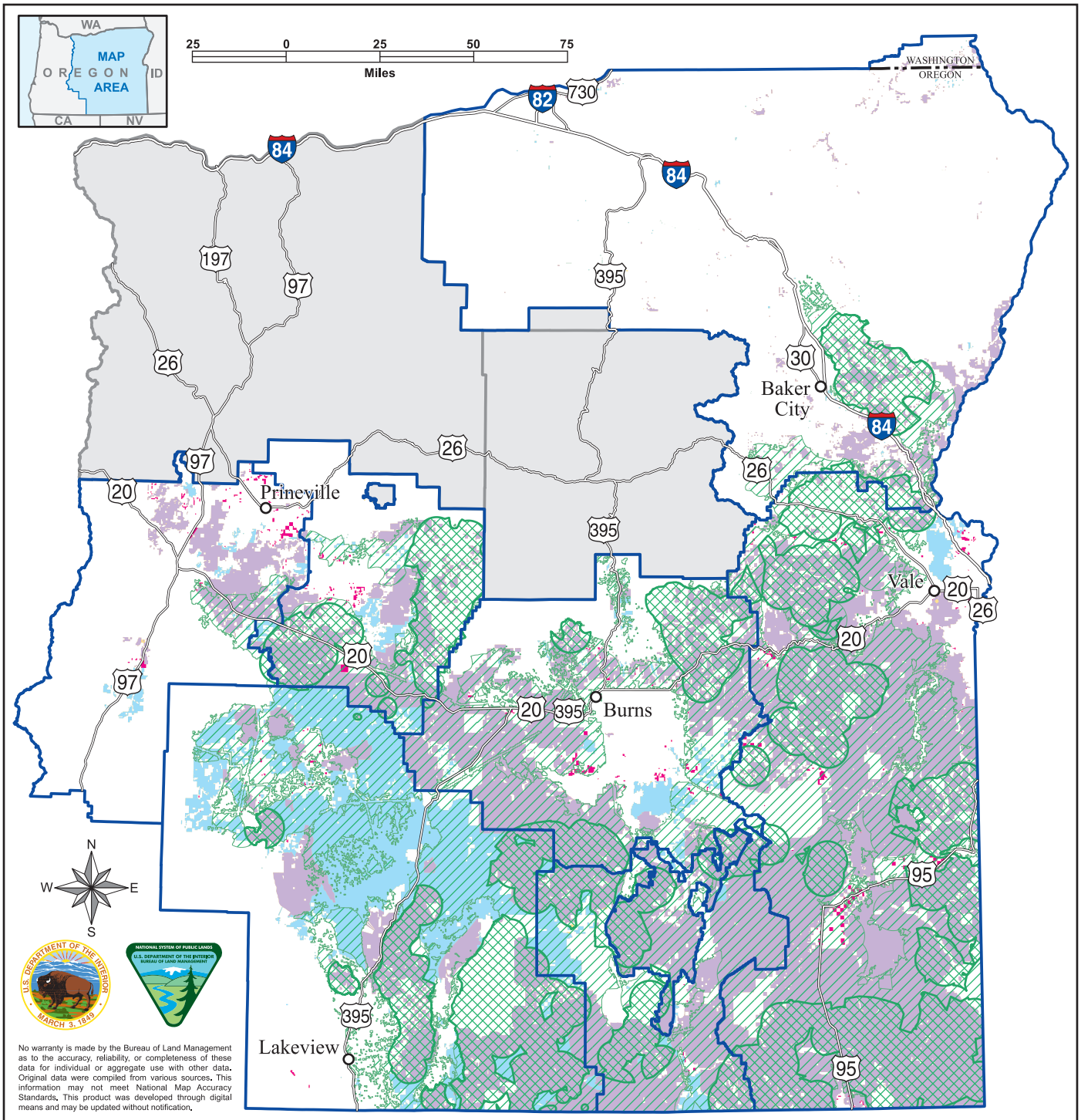
- Preliminary Priority Habitat
- Preliminary General Habitat

Land Tenure Zones

- Zone 1-Retention or Acquisition
- Zone 2-Exchange or Consolidation
- Zone 3-Disposal

Figure 2-13: Land Tenure Zones in the Planning Area Alternative A (No Action)

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

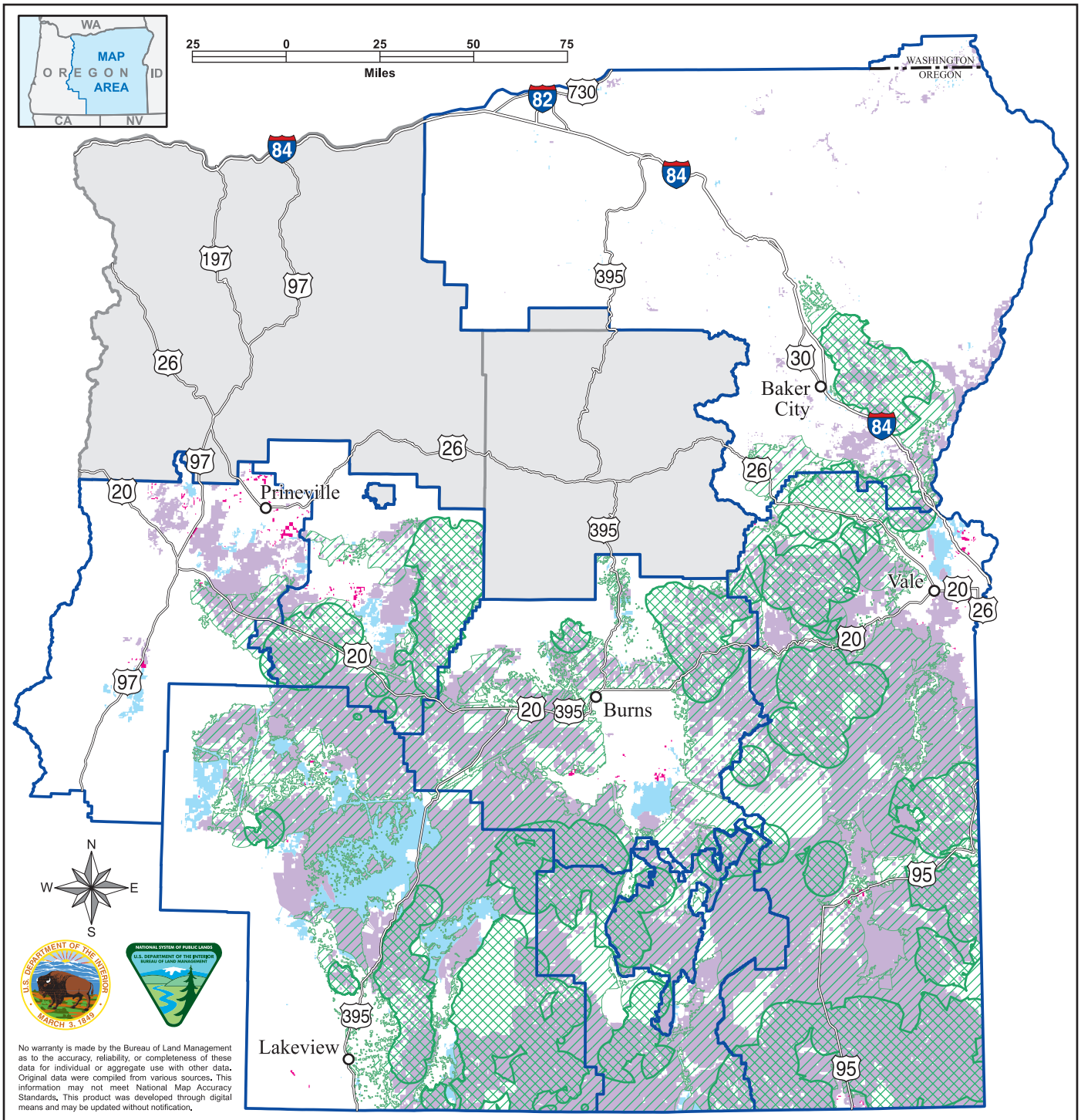
- Preliminary Priority Management Area
- Preliminary General Management Area

Land Tenure Zones

- Zone 1-Retention or Acquisition
- Zone 2-Exchange or Consolidation
- Zone 3-Disposal

Figure 2-14: Land Tenure Zones in the Planning Area Alternatives B, D, and F

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

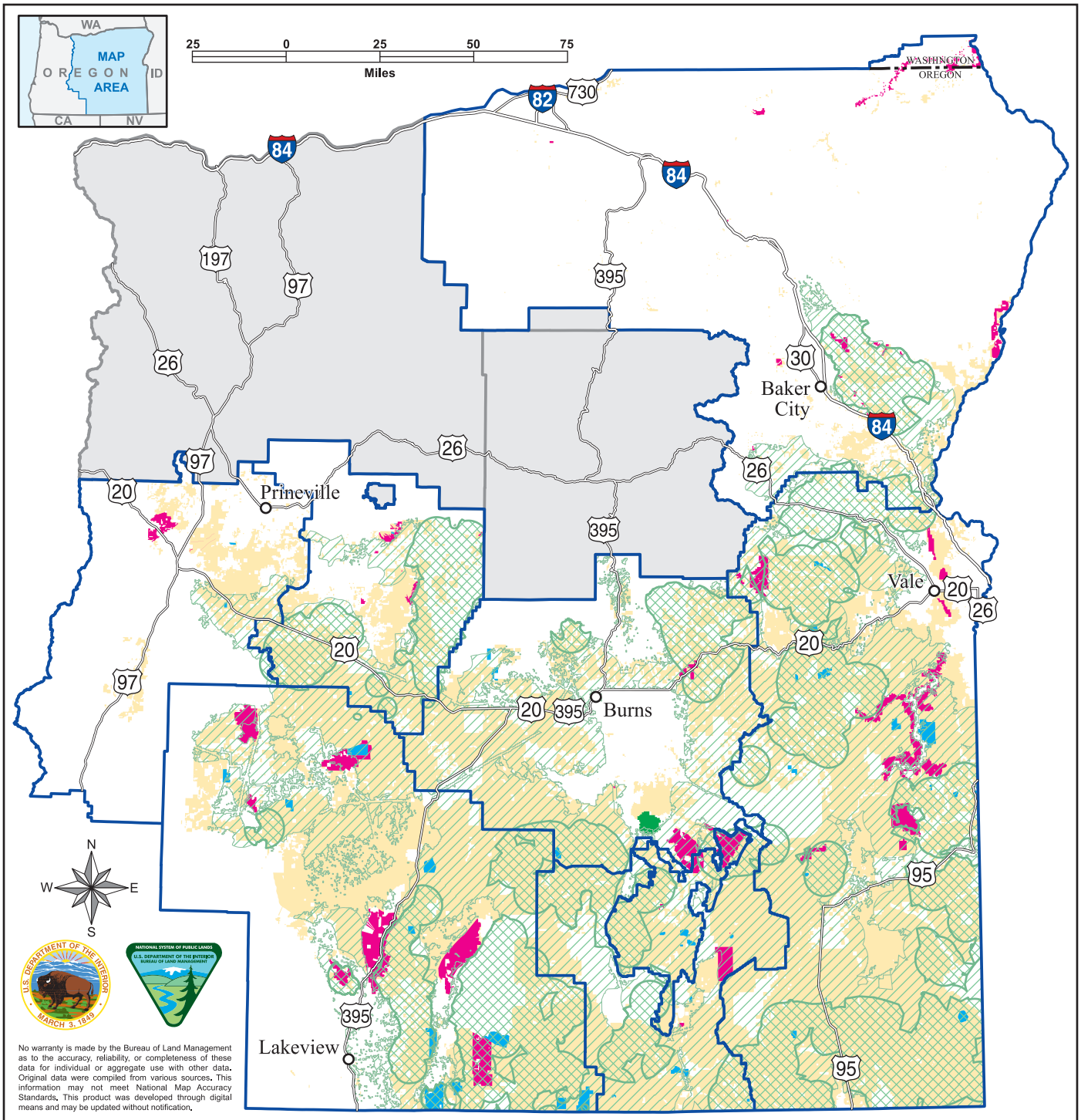
- Preliminary Priority Management Area
- Preliminary General Management Area

Land Tenure Zones

- Zone 1-Retention or Acquisition
- Zone 2-Exchange or Consolidation
- Zone 3-Disposal

Figure 2-15: Land Tenure Zones in the Planning Area Alternative C

M11-11-04

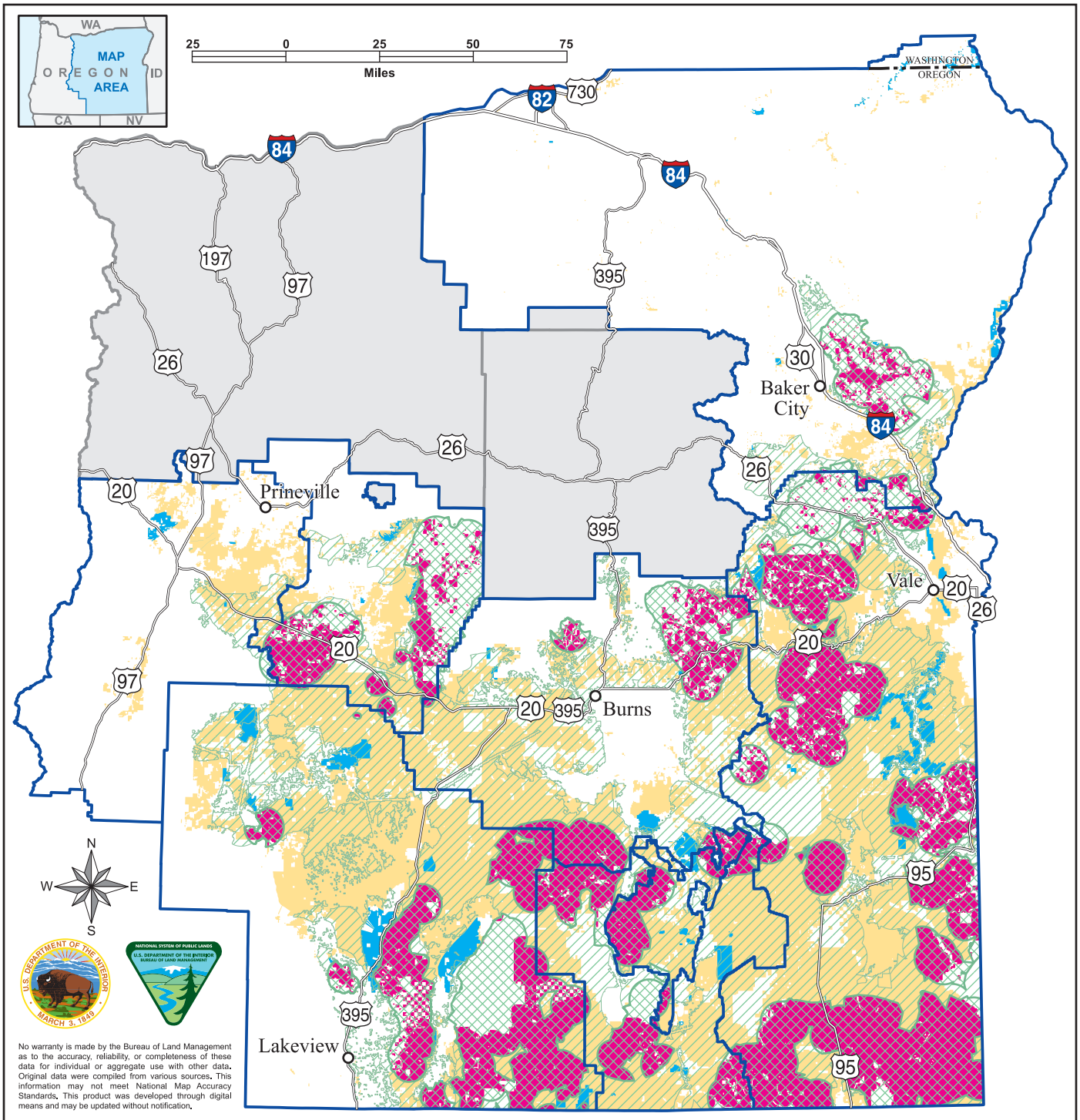


Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area
- **Greater Sage-Grouse Habitat**
  - Preliminary Priority Habitat
  - Preliminary General Habitat
- Primary Area of Critical Environmental Concern
- Outstanding Natural Area
- Research Natural Area
- Other BLM Administered Land

Figure 2-16: Areas of Critical Environmental Concern in the Planning Area Alternatives A (No Action), B, D, and E

M11-11-04

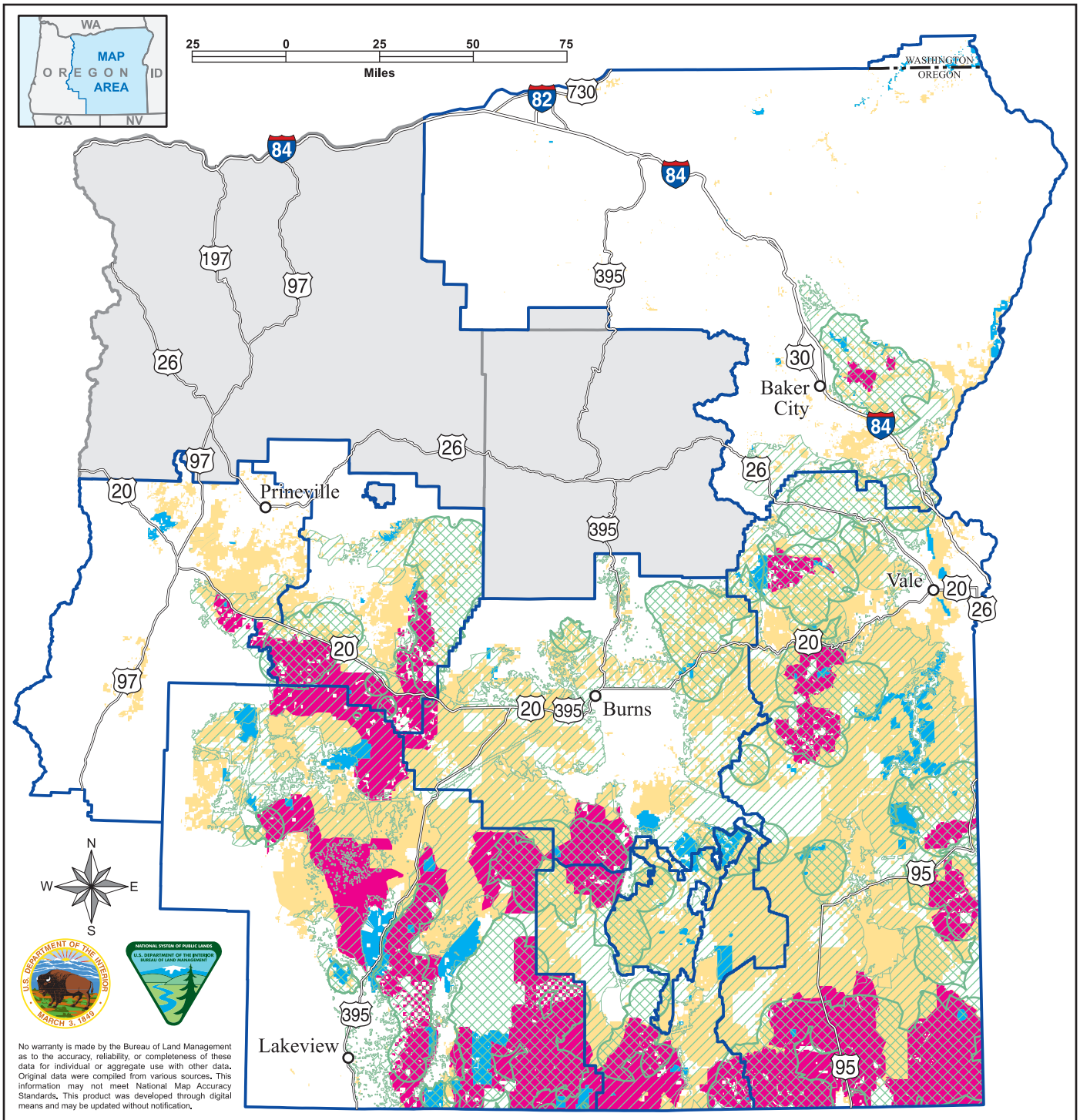


Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area
- **Greater Sage-Grouse Habitat**
  - Preliminary Priority Management Area
  - Preliminary General Management Area
- Existing Area of Critical Environmental Concern (Alternative A)
- Proposed Area of Critical Environmental Concern (Alternative C)
- Other BLM Administered Land

Figure 2-17: Areas of Critical Environmental Concern in the Planning Area Alternative C

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area
- **Greater Sage-Grouse Habitat**
  - Preliminary Priority Management Area
  - Preliminary General Management Area
- Existing Area of Critical Environmental Concern (Alternative A)
- Proposed Area of Critical Environmental Concern (Alternative F)
- Other BLM Administered Land

Figure 2-18: Areas of Critical Environmental Concern in the Planning Area Alternative F

M11-11-04

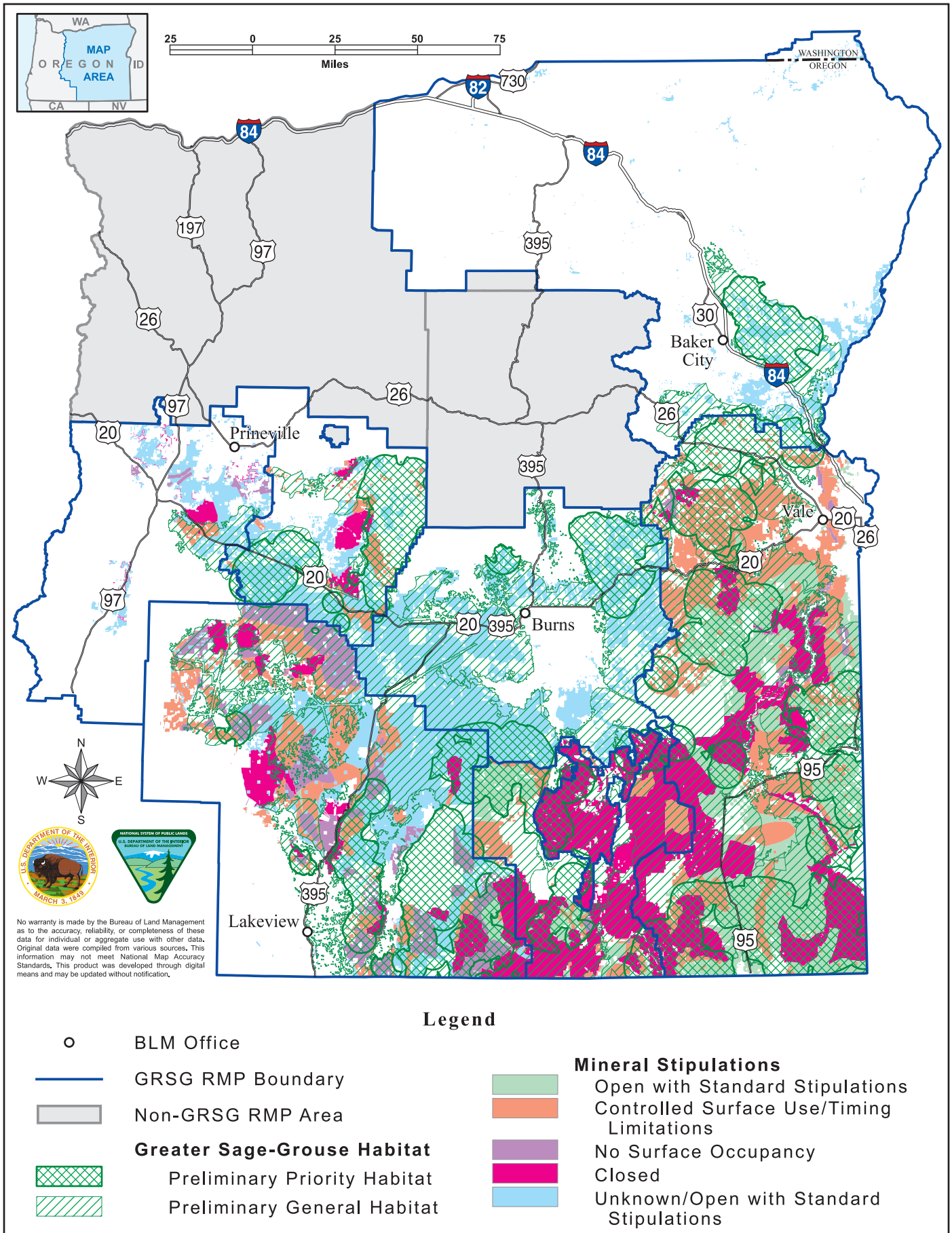


Figure 2-19: Fluid Mineral Leasing in the Planning Area Alternative A (No Action)

M11-11-04

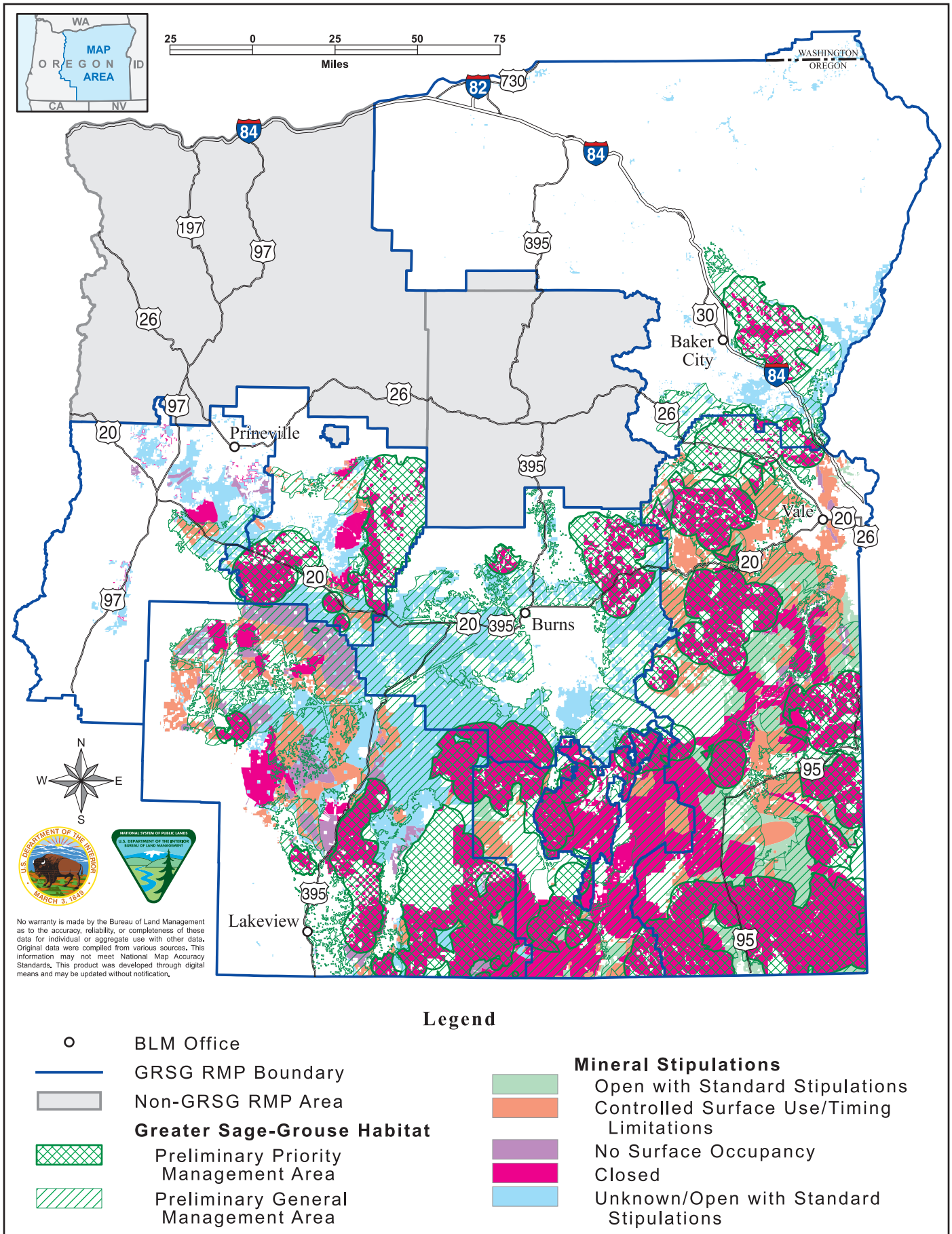
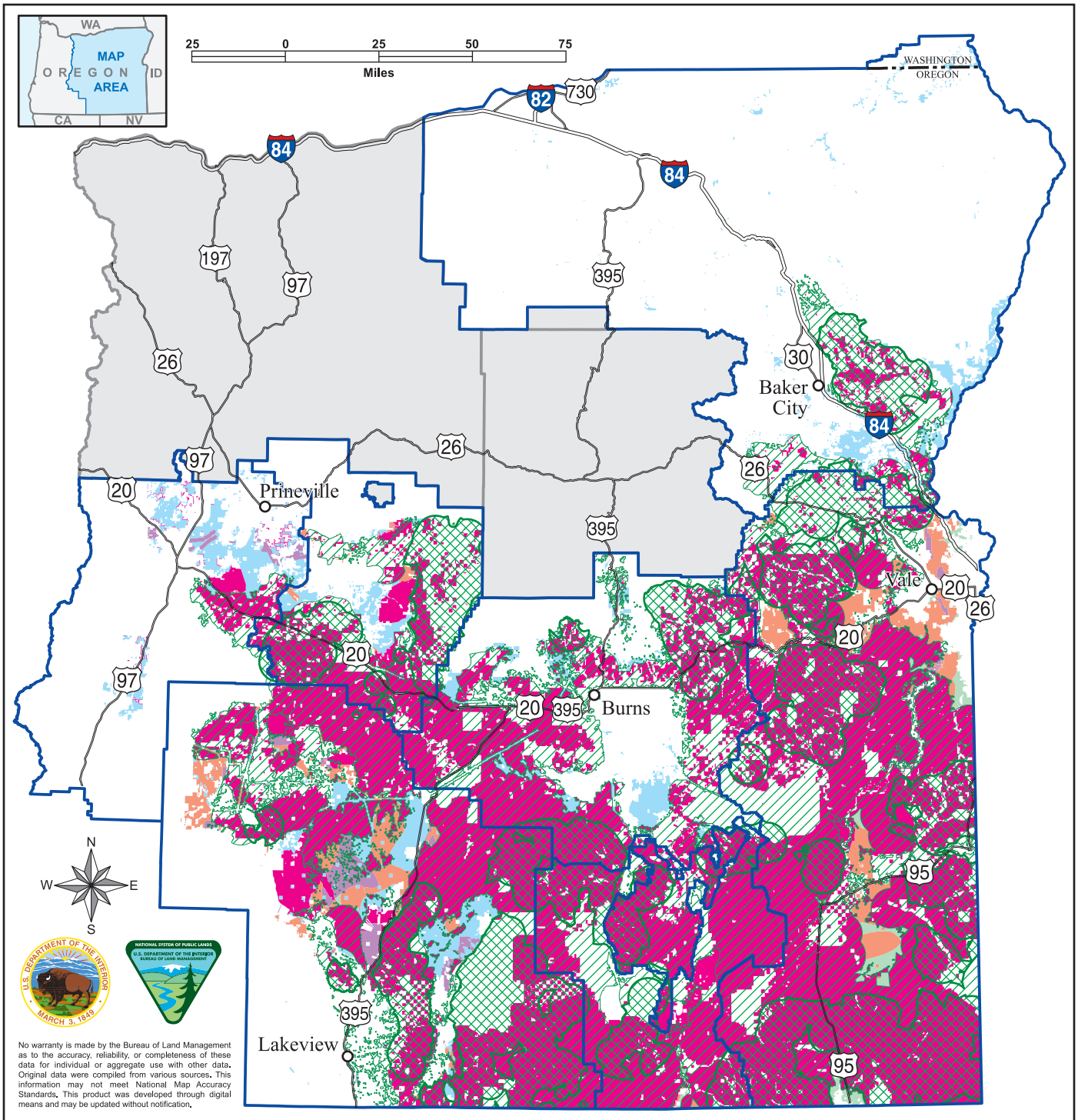


Figure 2-20: Fluid Mineral Leasing in the Planning Area Alternative B

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

- Preliminary Priority Management Area
- Preliminary General Management Area

Mineral Stipulations

- Open with Standard Stipulations
- Controlled Surface Use/Timing Limitations
- No Surface Occupancy
- Closed
- Unknown/Open with Standard Stipulations

Figure 2-21: Fluid Mineral Leasing in the Planning Area Alternative C

M11-11-04

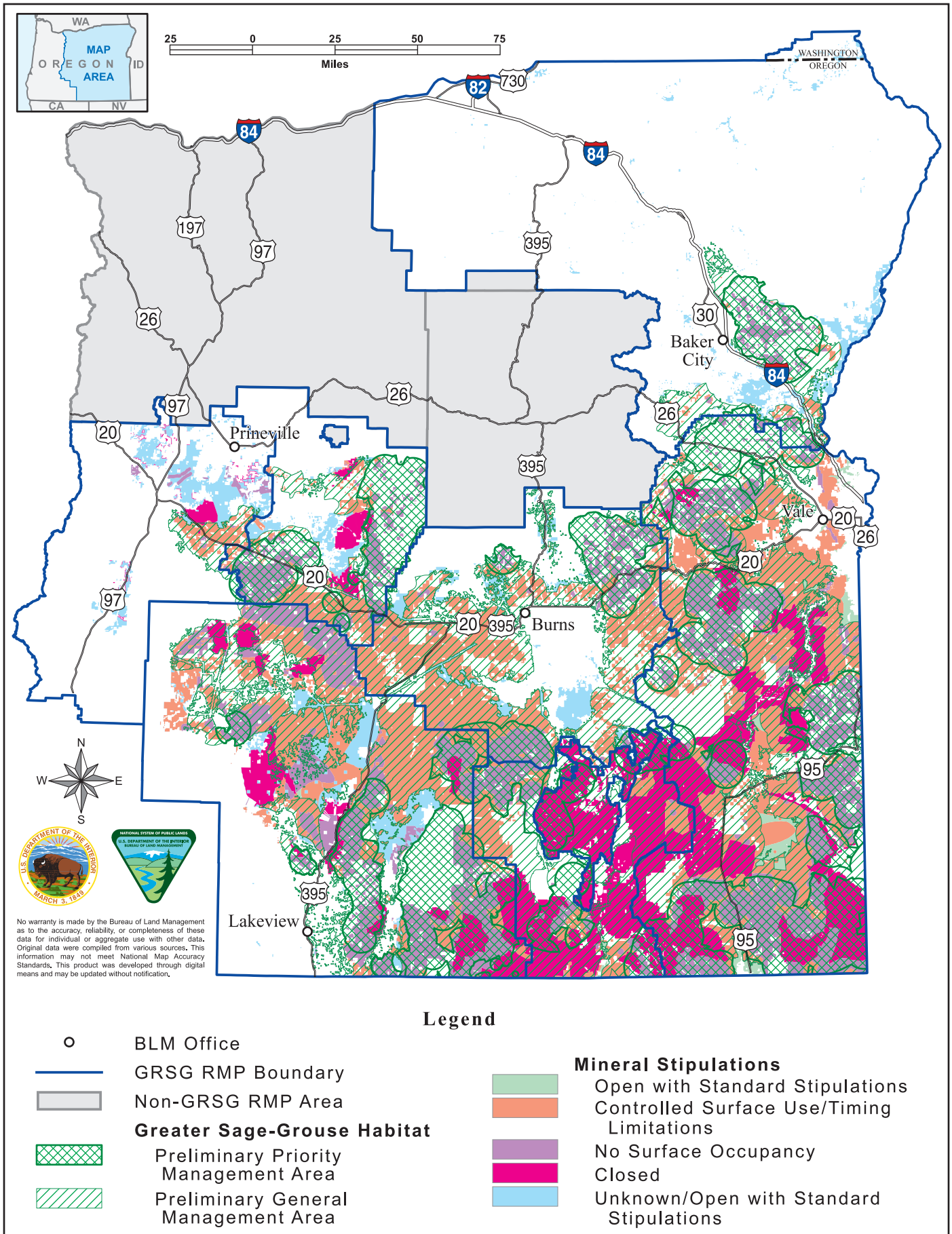
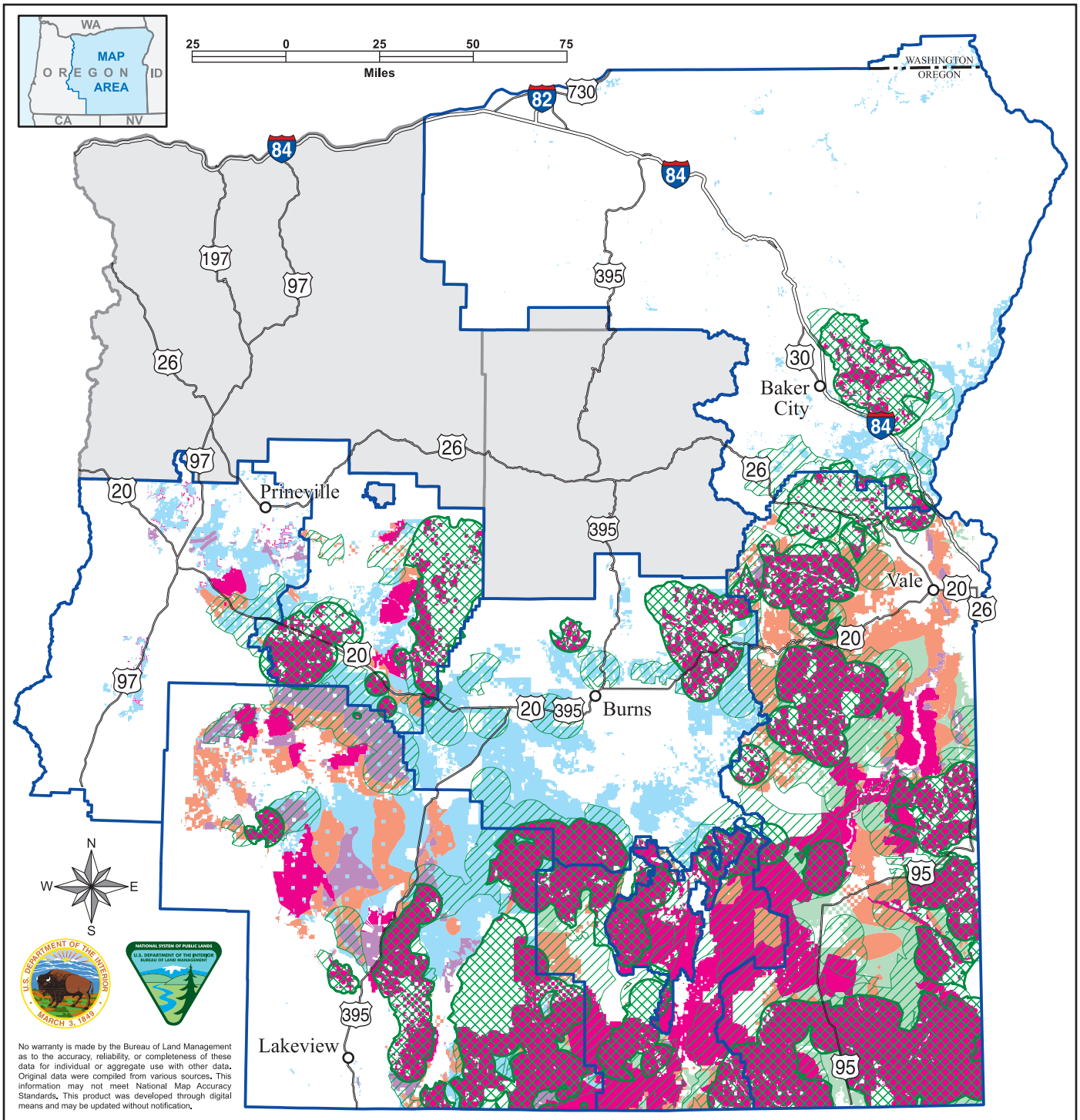


Figure 2-22: Fluid Mineral Leasing in the Planning Area Alternative D

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

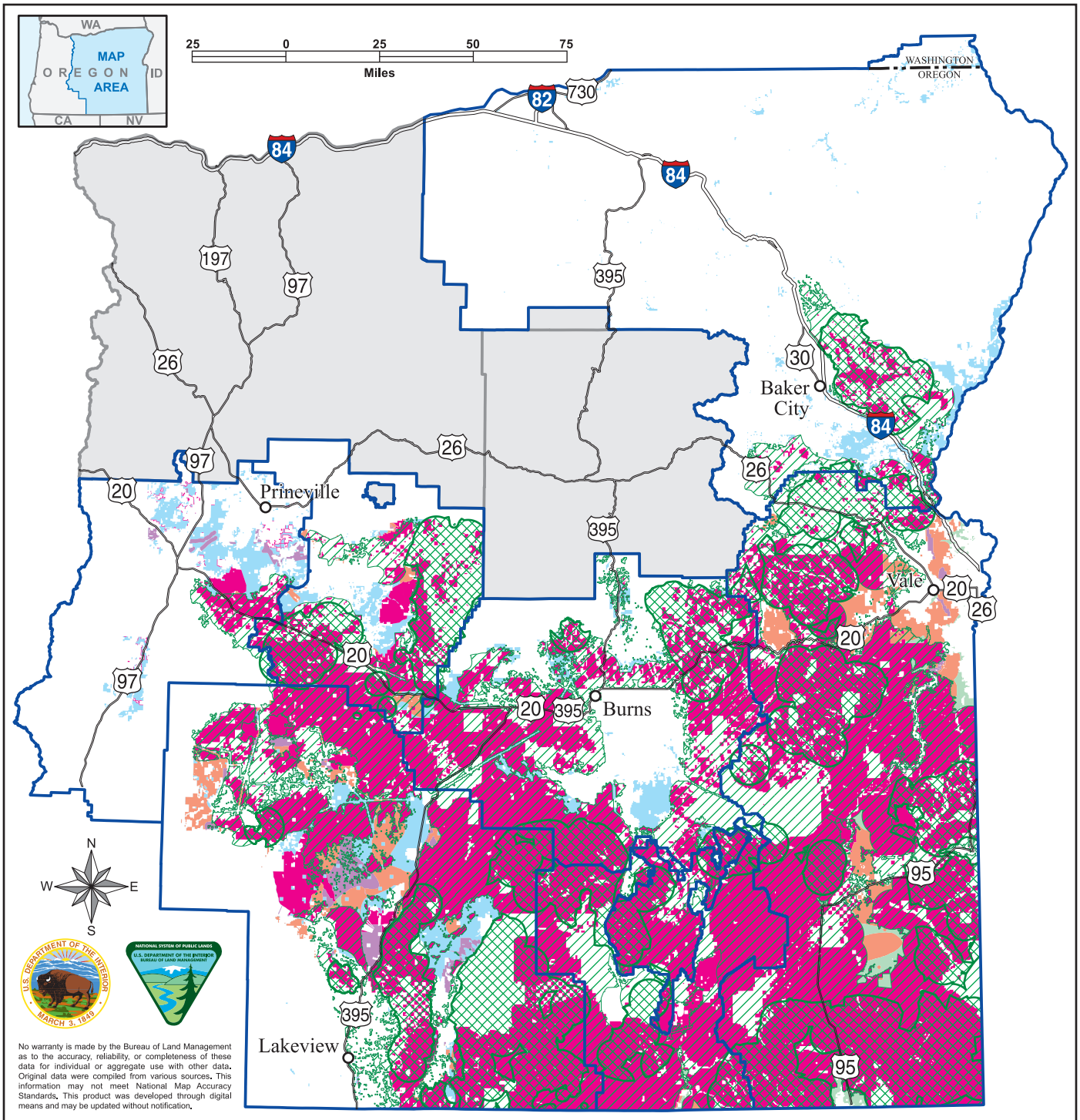
- Core Area
- Low Density

Mineral Stipulations

- Open with Standard Stipulations
- Controlled Surface Use/Timing Limitations
- No Surface Occupancy
- Closed
- Unknown/Open with Standard Stipulations

Figure 2-23: Fluid Mineral Leasing in the Planning Area Alternative E

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

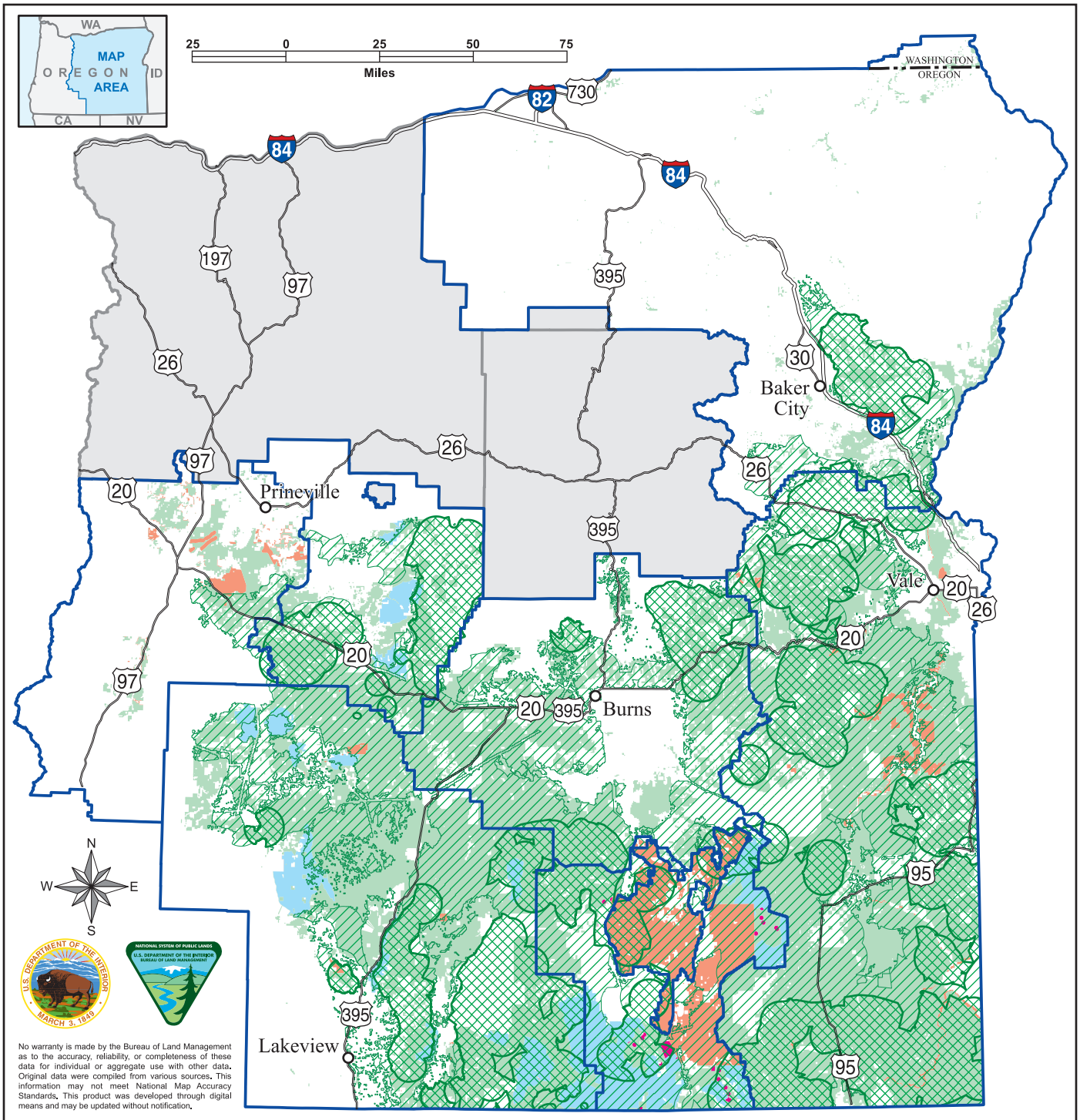
- Preliminary Priority Management Area
- Preliminary General Management Area

Mineral Stipulations

- Open with Standard Stipulations
- Controlled Surface Use/Timing Limitations
- No Surface Occupancy
- Closed
- Unknown/Open with Standard Stipulations

Figure 2-24: Fluid Mineral Leasing in the Planning Area Alternative F

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

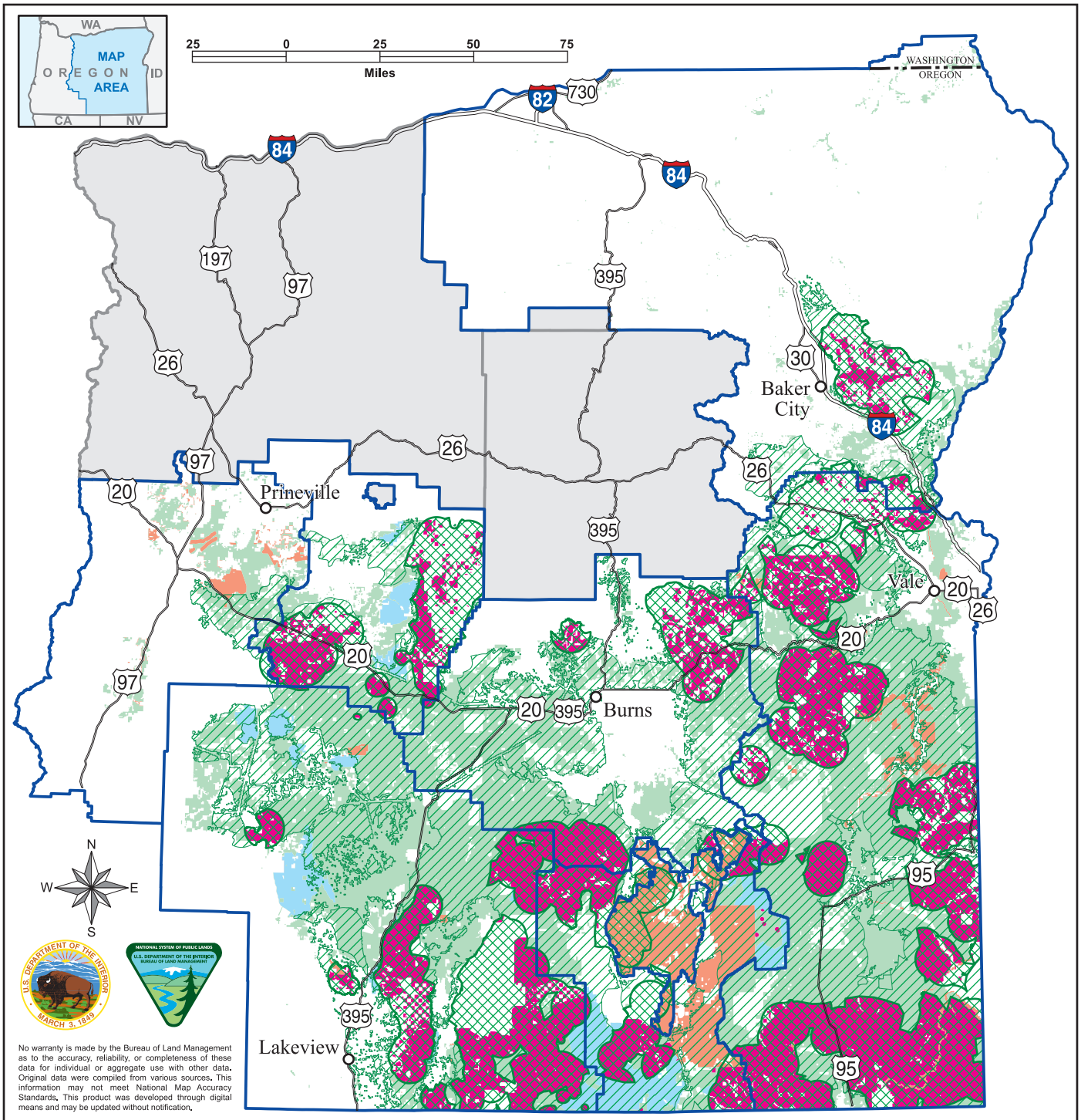
- Preliminary Priority Habitat
- Preliminary General Habitat

Mineral Stipulations

- Open
- Open to Mining Claim Location Subject to WSA IMP Nonimpairment Criteria
- Withdrawn from Mineral Entry
- Recommended for Withdrawal

Figure 2-25: Locatable Mineral Entry in the Planning Area Alternative A (No Action)

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

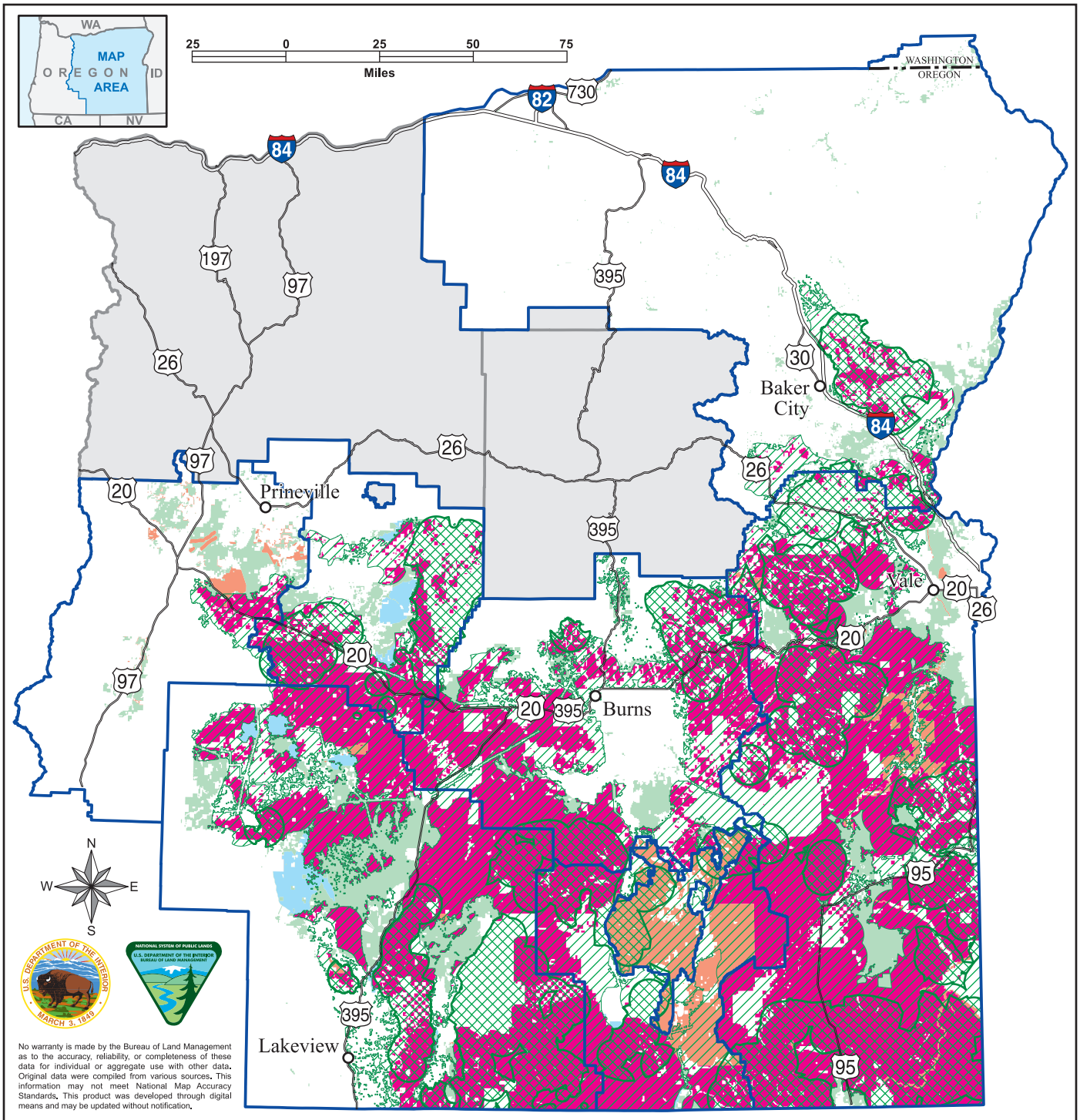
- Preliminary Priority Management Area
- Preliminary General Management Area

Mineral Stipulations

- Open
- Open to Mining Claim Location Subject to WSA IMP Nonimpairment Criteria
- Withdrawn from Mineral Entry
- Recommended for Withdrawal

Figure 2-26: Locatable Mineral Entry in the Planning Area Alternatives B and F

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

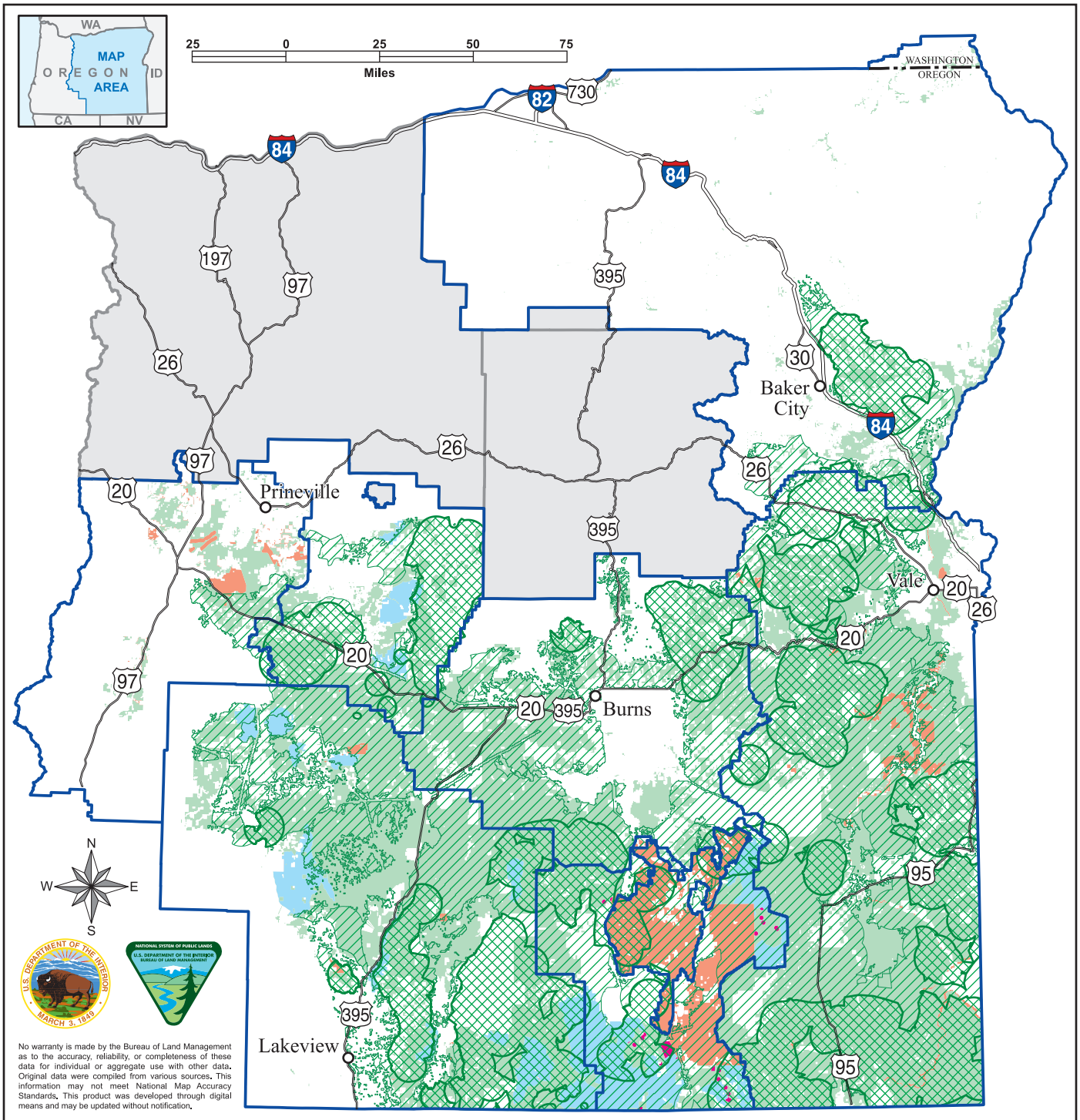
- Preliminary Priority Management Area
- Preliminary General Management Area

Mineral Stipulations

- Open
- Open to Mining Claim Location Subject to WSA IMP Nonimpairment Criteria
- Withdrawn from Mineral Entry
- Recommended for Withdrawal

Figure 2-27: Locatable Mineral Entry in the Planning Area Alternative C

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

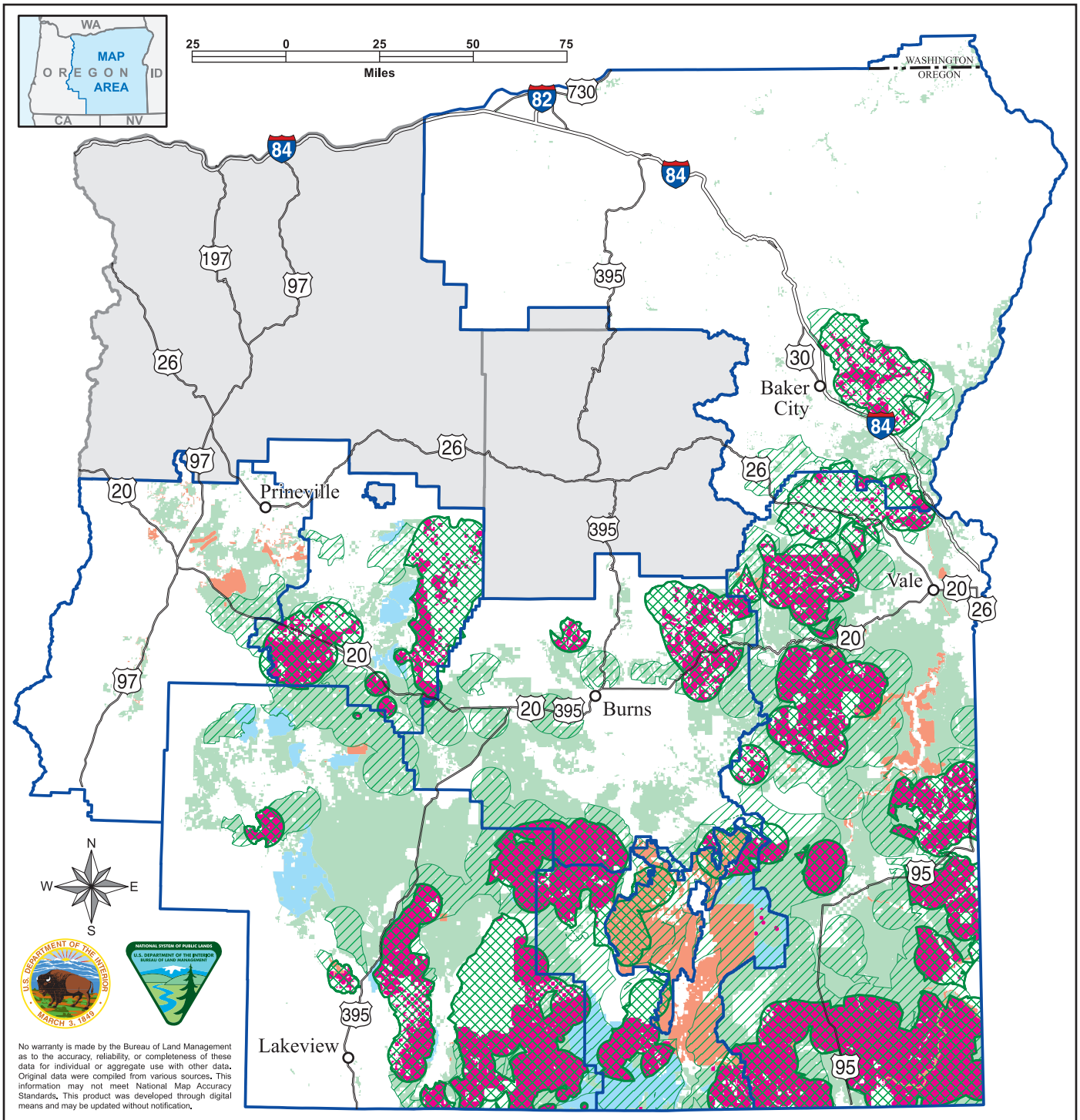
- Preliminary Priority Management Area
- Preliminary General

Mineral Stipulations

- Open
- Open to Mining Claim Location Subject to WSA IMP Nonimpairment Criteria
- Withdrawn from Mineral Entry
- Recommended for Withdrawal

Figure 2-28: Locatable Mineral Entry in the Planning Area Alternative D

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

- Core Area
- Low Density

Mineral Stipulations

- Open
- Open to Mining Claim Location Subject to WSA IMP Nonimpairment Criteria
- Withdrawn from Mineral Entry
- Recommended for Withdrawal

Figure 2-29: Locatable Mineral Entry in the Planning Area Alternative E

M11-11-04

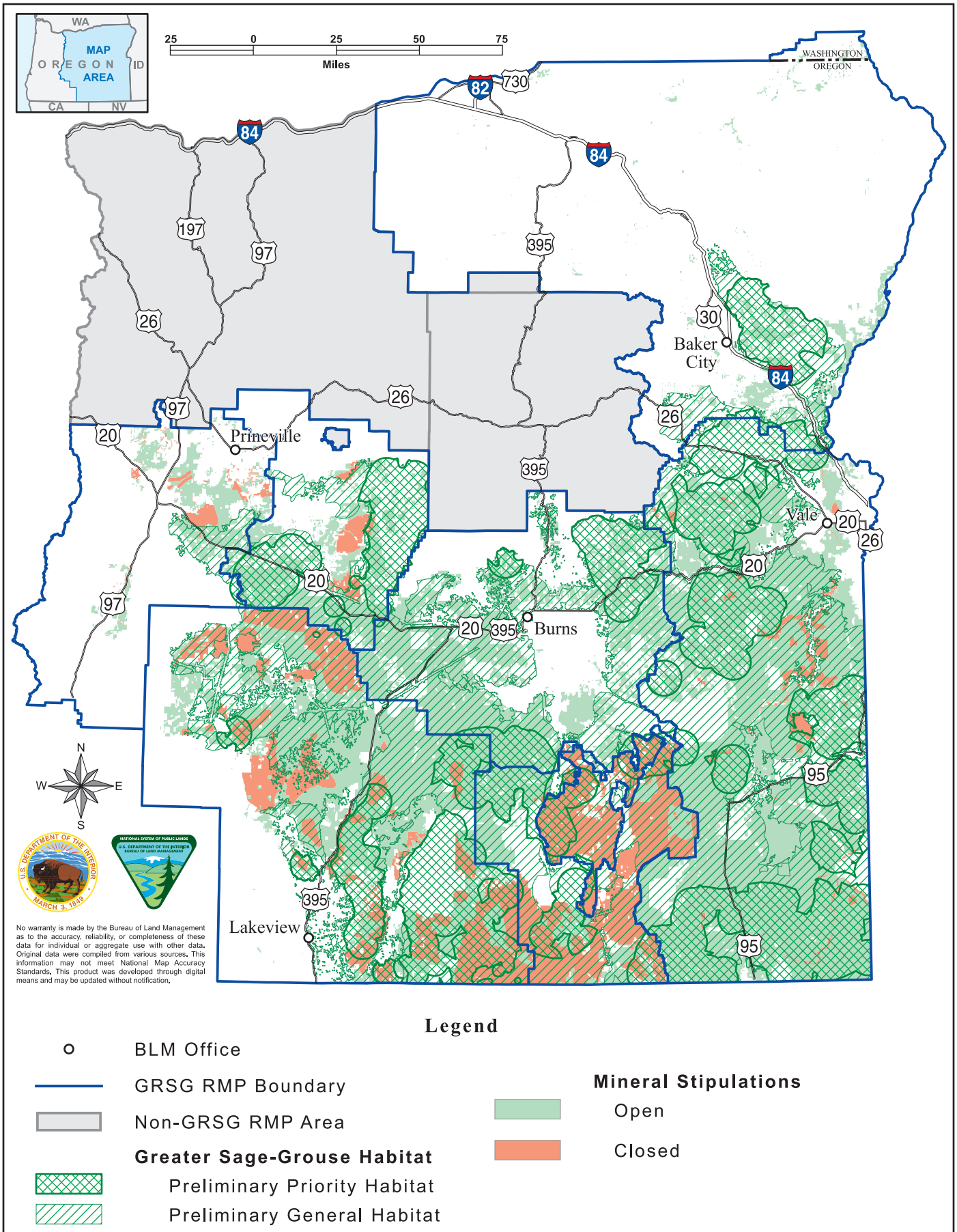


Figure 2-30: Mineral Materials Disposal in the Planning Area Alternative A (No Action)

M11-11-04

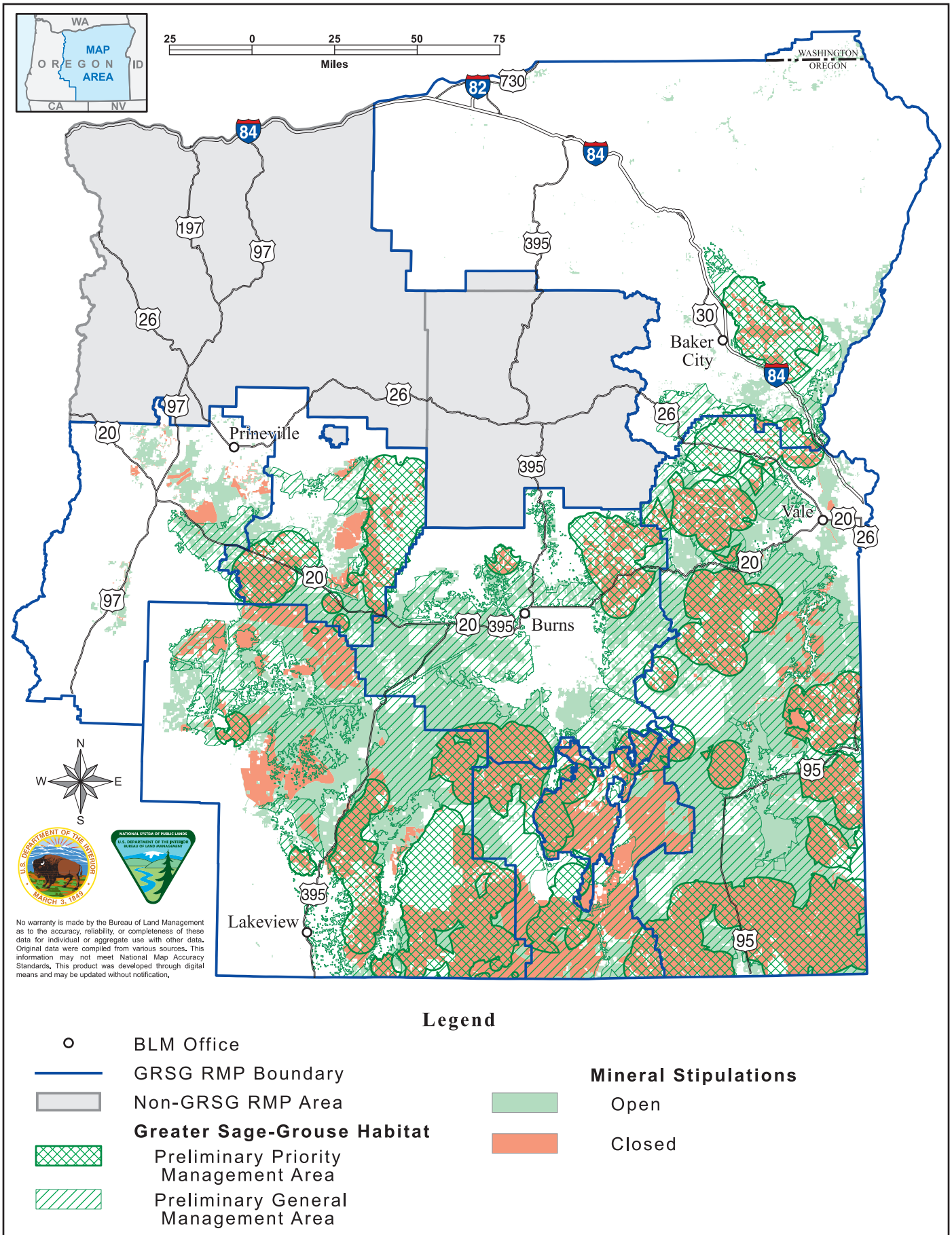
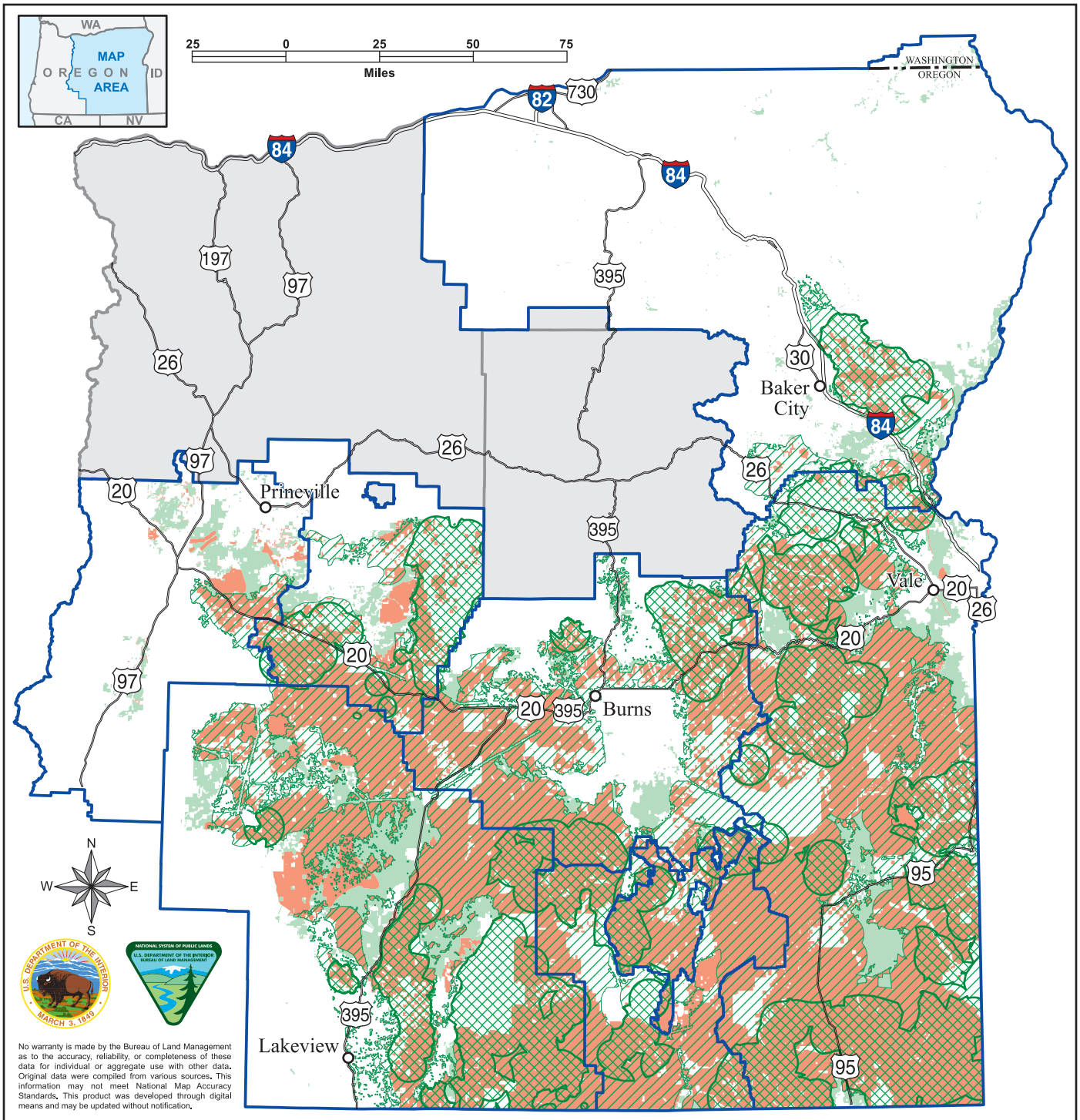


Figure 2-31: Mineral Materials Disposal in the Planning Area Alternatives B and F

M11-11-04



Legend

- BLM Office
- GRSG RMP Boundary
- Non-GRSG RMP Area

Greater Sage-Grouse Habitat

- Preliminary Priority Management Area
- Preliminary General Management Area

Mineral Stipulations

- Open
- Closed

Figure 2-32: Mineral Materials Disposal in the Planning Area Alternative C

M11-11-04

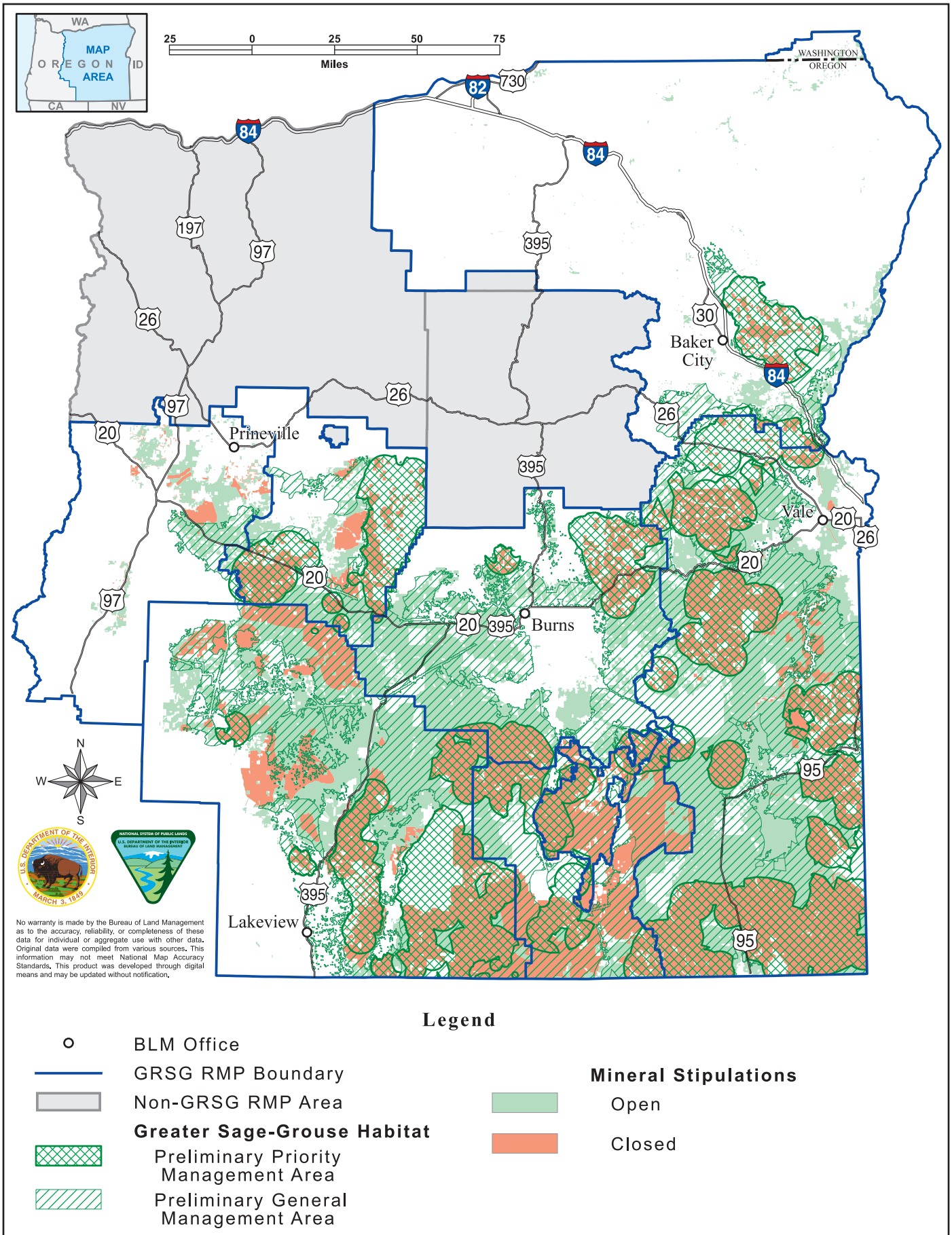


Figure 2-33: Mineral Materials Disposal in the Planning Area Alternative D

M11-11-04

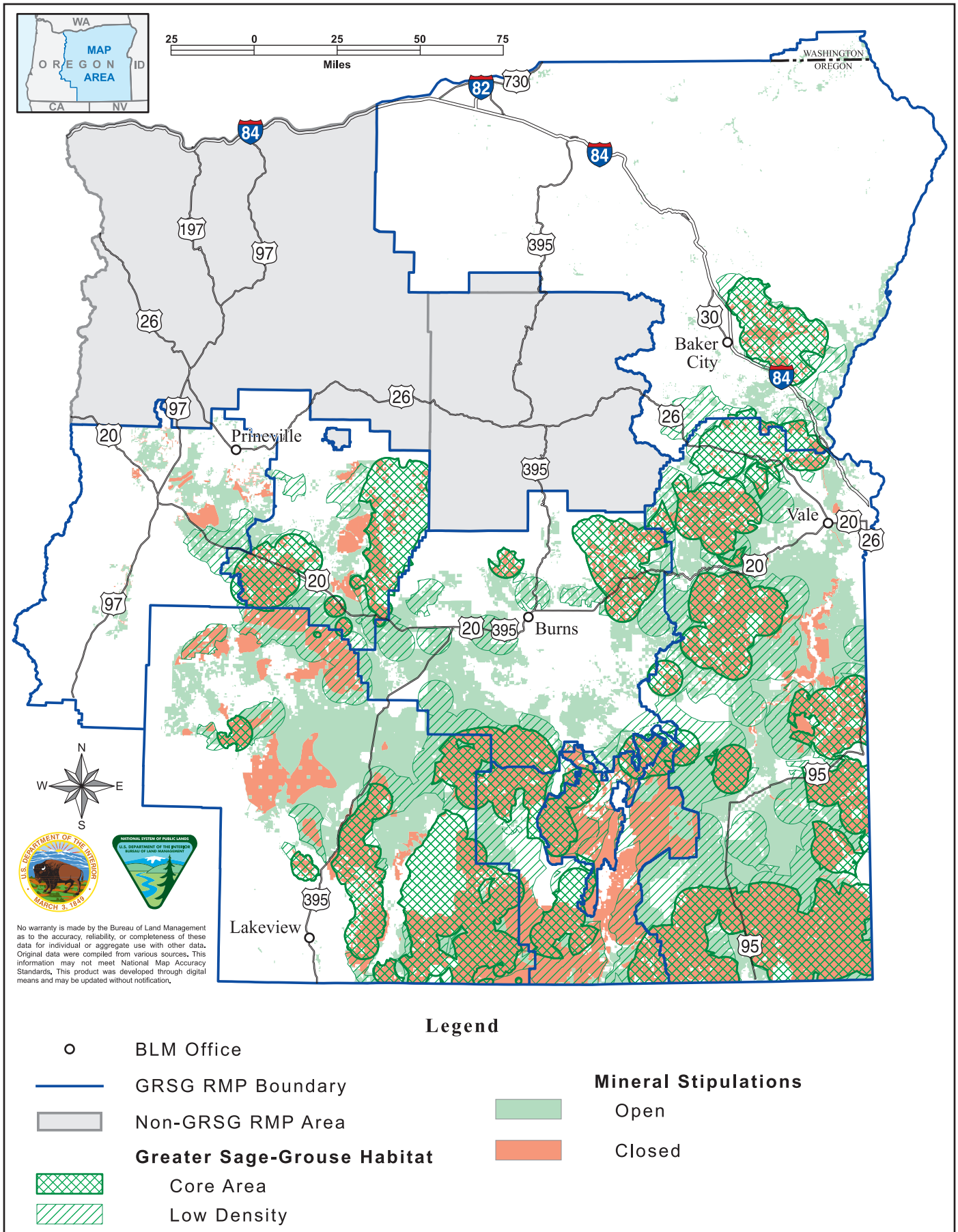


Figure 2-34: Mineral Materials Disposal in the Planning Area Alternative E

M11-11-04

Appendix B

Greater Sage-Grouse Management in Oregon
Sub-Region Resource Management Plans

APPENDIX B
GREATER SAGE-GROUSE MANAGEMENT IN OREGON SUB-REGION RESOURCE MANAGEMENT PLANS

Resource programs in the Oregon Sub-region Resource Management Plans (RMPs) being amended by this RMP Amendment (RMPA)/Environmental Impact Statement (EIS) contain management that influences Greater Sage-Grouse and their habitat. The management is not common to all Oregon Sub-region RMPs, but rather specific to certain RMPs. Resource programs that involve RMP-specific management include land use planning elements that may be, for example, localized to a particular area or involve prominent issues. It is important to note that the prominence of an issue can change over time. As a result, older RMPs may have minimal resource program management for issues that have recently become of greater concern.

BLM RMPs contain a set of decisions that establish management goals, objectives, and direction for land within an administrative area, as prescribed under the planning provisions of the Federal Land Policy and Management Act (FLPMA). The management direction is designed to achieve RMP objectives, which identify specific desired outcomes for resources. It includes management measures that will guide day-to-day and future activities. It also includes project design features, stipulations, best management practices, standard operating procedures, guidelines, required processes and prescriptions, and administrative designations (such as Areas of Critical Environmental Concern [ACECs] or proposed withdrawals). Oregon Sub-region RMPs contain directions that purposefully manage Greater Sage-Grouse and their habitat. The management direction is identified in the following table under the BLM resource programs.

Plan	GRSG Topic	Description of Management	Page
AMU	General Habitat	The Bureau of Land Management (BLM) program documents or interagency plan/NEPA documents and decisions applicable to the Andrews Management Unit (AMU) (and Cooperative Management and Protection Area) include the following: Greater Sage-Grouse and Sagebrush-Steppe Ecosystems Management Guidelines (DOI et al. 2000b).	9
AMU	General Habitat	Actions to diversify structure and composition of selected nonnative seedings will be implemented when consistent with other resource objectives.	30
AMU	General Habitat	In managing uplands, the BLM needs to consider the consequences and relationships of management to life history needs of wildlife. The Executive Order on the Responsibilities of Federal Agencies to protect Migratory Birds, the Greater Sage-Grouse and Sagebrush-Steppe Ecosystem Management Guidelines, the BLM National (or Oregon/Washington state level) Sage-Grouse Habitat Conservation Strategy, and the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (when approved), give direction to protect or restore habitat for these species, many of which are Special Status Species.	35
AMU	General Habitat	Areas used by Greater Sage-Grouse and other Special Status Species will be identified in efforts orchestrated with the Oregon Department of Fish and Wildlife (ODFW) or the United States Fish and Wildlife Service (USFWS). Habitat management will be coordinated across agency boundaries.	37
AMU	General Habitat	Unless specifically needed as a vegetation management tool, the utilization level as measured at the end of the growing season will not exceed 60 percent on nonnative seedings and 50 percent on native herbaceous forage plants, on a pasture average basis, except where lower use levels may be necessary to prevent detrimental effects on habitat quality for sage-grouse.	54
AMU	General Habitat	Increase species and structural diversity at the plant community and landscape levels in the big sagebrush communities. Provide multiple successional stages within the landscape.	30
AMU	General Habitat	Manage big sagebrush, quaking aspen, and western juniper plant communities to meet habitat requirements for wildlife.	30
AMU	General Habitat	Manage big sagebrush communities to meet the life history requirements of sagebrush-dependent species.	30
AMU	General Habitat	Big sagebrush, quaking aspen, and western juniper plant communities will be managed for the benefit of all wildlife and to meet the DRC in most habitats throughout the AMU.	31
AMU	General Habitat	Throughout the AMU, approximately 5,000 acres of nonnative seedings and most native vegetation in deer winter range, where vegetative species diversity is low, will be interseeded to establish native plant species. Where appropriate, other desirable nonnative plant species could be used. Livestock grazing may be used to suppress competition and allow sagebrush establishment. In areas to be reseeded, coordination with permittees, the ODFW, and the USFWS will occur to set livestock grazing prescriptions on a site-specific basis.	34
AMU	General Habitat; Habitat Fragmentation	Big sagebrush habitat will be managed for shrub cover, structure, and forage values for the benefit of game and nongame wildlife. The DRC will include shrub cover values that meet or exceed the requirements described in Wildlife Habitats in Managed Rangelands (1984) and include big sagebrush distribution over a large enough area to avoid the adverse impacts of habitat fragmentation. The DRC will strive for big sagebrush overstories that emphasize the presence of mature, light- to moderately-stocked shrub canopies capable of supporting diverse herbaceous understories and are present in a variety of spatial arrangements important to wildlife. This will apply to most native range or seeded areas in big sagebrush habitats throughout the AMU.	31
AMU	General Habitat; Sagebrush Removal	(Restoration Seed Types and Mixes): In Greater Sage-Grouse habitat or deer winter range or both, interseeding, preferably using locally obtained seed, to establish native plant species onto approximately 5,000 acres of nonnative seedings throughout the AMU will be utilized where vegetative species diversity is low. The term "low species diversity" means conditions in seeded areas that are predominantly crested wheatgrass, or that have reverted to cheatgrass dominance, or few herbaceous plants with an overstory of sagebrush. Other desirable nonnative species could be used in the seeding mix. Livestock grazing could be used to suppress competition and allow sagebrush establishment. In areas to be reseeded, coordination with permittees, the ODFW, and the USFWS will occur to set	30

Plan	GRSG Topic	Description of Management	Page
		livestock grazing prescriptions on a site-specific basis. Emphasis of this project includes establishment of seedings on the north and west sides of Cooperative Management and Protection Area (CMPA). Brushbeating of sagebrush in a mosaic pattern may be allowed on 50 percent of seeded areas where brush cover is high.	
Baker	General Habitat	Habitat Management Plans (HMPs) will be developed for economically important wildlife species, including mule deer, antelope, bighorn sheep, and grouse. Primary emphasis of many of the plans will be ensuring the availability of palatable shrubs and cover for deer on crucial winter ranges in Baker County. Benefits will also accrue for many nongame species as a result of these habitat enhancement projects.	18
Baker	General Habitat	Improve upland habitat conditions for sage-grouse, antelope, and mule deer.	82
Baker	General Habitat	Improve and maintain, where suitable, wet meadows for sage-grouse and antelope.	82
Brothers-Lapine	General Habitat	HMPs will be written for high priority wildlife habitats, These plans will detail how those habitats will be improved or maintained. Plans for bald eagles are expected to be written during this planning cycle.	97
Lakeview	General Habitat	Upland native shrub steppe communities will be managed to attain a trend toward the desired range of conditions based on management objectives and site potential. Management actions will maintain the condition of those native communities where vegetation composition and structure meet desired range of conditions.	28
Lakeview	General Habitat	Equal emphasis will be placed on game and nongame wildlife habitat needs in sagebrush steppe, forest, woodland, and other priority habitats. To the extent possible and practical, wildlife community connectivity and interrelationships will be emphasized in most habitats. This approach will stress landscape or ecosystem management and be distinctly different from single-species management emphasis.	50
Lakeview	General Habitat/ Habitat Fragmentation	Big sagebrush habitat will be managed for shrub cover, structure, and forage values for the benefit of game and nongame wildlife. The desired range of conditions will include shrub cover values that meet or exceed the requirements described in "Wildlife Habitats in Managed Rangelands" (Thomas and Maser 1986) and provide big sagebrush distribution over a large enough area to avoid the adverse impacts of habitat fragmentation. Will strive to provide big sagebrush overstories that emphasize the presence of mature, light-to moderately stocked shrub canopies, and that are present in a variety of spatial arrangements important to wildlife.	unknown
Lakeview	General Habitat	Management of wildfire, prescribed fire, livestock grazing, wild horses, western juniper, invasive vegetation, vegetation treatments, land tenure, recreation, predators, and West Nile virus within current greater sage-grouse habitat will follow the guidelines outlined in the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat"* (ODFW 2005, p. 70-87), to the extent it conforms with other management direction in this RMP. However, the energy and minerals and right-of-way management direction described elsewhere in this RMP will be retained and applied to sage-grouse breeding habitat only (refer to Lands and Realty section, p. 93-94 and Map L-8 and the Energy and Minerals section, p. 88-92 and Maps M-8, M-9, and M-10).	5 as maintained
Lakeview	General Habitat	Management will emphasize achieving desired range of conditions that maintain, enhance, or restore habitats or populations of special status species regardless of their economic status. All special status species habitats or populations will be managed so that BLM actions will not contribute toward the need to list the species as Federally threatened or endangered.	52
Lakeview	Habitat Fragmentation	Management of large blocks of sagebrush steppe will also be done with migratory landbirds in mind. Management will focus on existing shrub steppe in high ecological condition on a no-net-loss basis and improve degraded habitats. Habitat fragmentation will be reduced through active restoration of degraded rangelands and changes in management activities.	50
Southeastern Oregon	General Habitat Objective	Manage big sagebrush cover in seedings and on native rangeland to meet the life history requirements of sagebrush-dependent wildlife.	40
Southeastern Oregon	General Habitat	Objective 2: Manage big sagebrush cover in seedings and on native rangeland to meet the life history requirements of sagebrush-dependent wildlife.	40

Plan	GRSG Topic	Description of Management	Page
		Management will strive for greater than 70 percent or more of the total potential sagebrush habitat to achieve desired range future conditions (DRFCs) in each resource area over the long term. Native range and most seedings will be managed to meet the requirements of game and a host of nongame species. Management will be to maintain or establish diversity, mosaics, and connectivity of sagebrush between geographic areas at middle and fine scales. The obligation to provide sagebrush cover for its various wildlife habitat values will be met in most areas. The overall goal of this alternative is to emphasize plant and animal community health at landscape levels.	
Southeastern Oregon	General Habitat; Habitat Fragmentation	Manage to maintain or establish connectivity of big sagebrush types between geographic management areas (GMAs) at mid and fine scales. To achieve desired wildlife habitat conditions, management will include a variety of methods to maintain, increase, or decrease the big sagebrush overstory.	51
Southeastern Oregon	Wildlife and wildlife habitats	To the extent possible and practical, wildlife community connectivity and interrelationships will be emphasized in most habitats. Management emphasis will substantially address source habitats and species of focus described in the Interior Columbia Basin Ecosystem Management Plan (ICEBMP) science.	51
Southeastern Oregon	Appendix F-Wildlife Habitat Descriptions and Considerations	Summary of Appendix F (Introduction): Chapter 3 describes the DRFCs for land, resource, and social and economic conditions that are expected to be present on public land in 50 to 100 years if the plan management objectives are achieved. Because the DRFCs are descriptions associated with long-term BLM management, they provide limited direction for wildlife habitat assessments and prescriptions over the next 20 years. Due to this limitation, Appendix F has been included here to provide more descriptions of habitat characteristics important to wildlife that will be incorporated into activity plans and evaluated in both the short and the long term.	F-1
Southeastern Oregon	ACECs	A significant number of ACECs have sage-grouse specifically, or sagebrush habitat that is fundamental to sage-grouse life cycle needs as Relevant and Important values. Each of these has management actions targeted at conserving/protecting the species and/or its habitat.	68-101
Southeastern Oregon	Habitat Restoration	Guidance contained in 43 CFR 4180 of the regulations directs public land management toward the maintenance or restoration of the physical function and biological health of rangeland ecosystems. Standards of Rangeland Health and Guidelines for Livestock Grazing Management (S&G's) for public land administered by the BLM in Oregon and Washington were approved by the Secretary of the Interior on August 12, 1997 (USDI-BLM 1997). This objective will maintain and improve the condition and trend in plant communities that provide wildlife habitat, recreation, forage, scientific, scenic, ecological, and water and soil conservation benefits for consumptive and nonconsumptive uses. The long-term goal of vegetation management across the landscape is to maintain or improve rangeland condition to DRFCs that meet management objectives, not specifically late-potential natural communities (PNCs) ecological status.	38
Southeastern Oregon	Habitat Restoration	All special status species habitats or populations will be managed so that BLM actions will not contribute to the need to list the species as Federally threatened or endangered. Management will consist of a mix of protection, restoration, and enhancement actions. It will be oriented toward the development of habitats that support healthy, biologically diverse plant communities at landscape levels while meeting the needs of special status species. A variety of projects or other land use adjustments might be required to manage for special status species. Management could require avoidance or mitigation that may have little impact on land uses, while restoration or enhancement could lead to substantial adjustments in customary land use. Management will emphasize achieving conditions that maintain, enhance, or restore habitats and populations regardless of their economic status. All special status species habitats or populations will be substantially managed so that BLM	Appendix F-5

Plan	GRSG Topic	Description of Management	Page
		actions do not contribute toward the need to list these species as Federally threatened or endangered. Individual species requirements will be included in management prescriptions but not to an extent that overemphasizes the value of any one habitat. Restoration and management of sagebrush communities that are important for sagebrush obligate wildlife species, including sage-grouse are described in detail in the Southeast Oregon RMP (SEORMP) Appendix F-5.	
Southeastern Oregon	Habitat Restoration	Wildlife diversity and productivity is profoundly influenced by the relative abundance, structure, and spatial arrangement of sagebrush communities (refer to Chapter 2, Wildlife and Wildlife Habitat, Figure 2-1 Preliminary SEORMP/Final EIS). Management of sagebrush communities that is appropriate to soil, climate, and landform needs to incorporate the following overstory and understory components, which contribute towards healthy wildlife habitats: Shrub overstory: Big sagebrush, low sagebrush, and other shrubby species within the genus Artemisia provide primary sources of wildlife habitat structure, food, and cover. Herbaceous understory: Grasses and forbs provide primary sources of wildlife habitat structure, food and cover. Herbaceous cover also provides indirect food sources for wildlife by supporting the environments that produce insects consumed by birds and other small animals.	Figure 2-1 Preliminary SEORMP/ Final EIS
Southeastern Oregon	Habitat Restoration	Exceeding the fine scale (pasture level) percents (acreages) for shrub cover values shown in Table F-2 may be necessary in order to compensate for currently fragmented habitats and/or where it is likely that fragmentation will continue due to fire history and frequency. Determining activity plan objectives can only be made after considering existing cover conditions at mid scales and larger, and in light of wildlife survey or habitat relationships data. This will be accomplished as a part of the rangeland health assessment process.	F-5
Southeastern Oregon	Habitat Restoration	Avoidance or mitigation of disturbing activities can usually be accomplished by prescribing adjustments to the timing, location, or duration of authorized actions. In some instances, project denial may be the only appropriate course of action where resource values are high and mitigation or avoidance cannot reasonably be made. The appropriate measures necessary for the protection of wildlife need to consider the nature of proposed actions, the species affected, and the time of year the action is expected to occur.	F-2
Southeastern Oregon	Habitat Restoration	Seedings will be implemented with appropriate mixes of adapted perennial species. Species mixes will be determined on a site-specific basis dependent on the probability of successful establishment, risks associated with seeding failure, and other management considerations. Preference will be toward the use of native species, though nonnative species may be used when better adapted to out-compete established annual species. Use of competitive native species or desirable nonnative species will be emphasized in seedings within sites moderately and highly susceptible to degradation. Treatment configuration will emphasize the maintenance of natural values as consistent with other resource management objectives.	40
Southeastern Oregon	Habitat Restoration	Management will be to maintain or establish diversity, mosaics, and connectivity of sagebrush between geographic areas at middle and fine scales. The obligation to provide sagebrush cover for its various wildlife habitat values will be met in most areas. The overall goal of this alternative is to emphasize plant and animal community health at landscape levels. To achieve DRFCs, management will include a variety of methods to increase or decrease big sagebrush overstory. Quantifications of shrub occurrence are described in Appendix F.	40-41
Southeastern Oregon	Habitat Restoration	Over the life of this plan, vegetation communities will be monitored to determine progress toward attaining DRFCs. Monitoring to determine success in meeting vegetation management objectives will include periodic measurements of plant composition, vigor, and productivity as well as measurement of the amount and distribution of plant cover and litter which protects the soil surface from raindrop impact, detains overland flow, protects the surface from wind	40, Monitoring

Plan	GRSG Topic	Description of Management	Page
		erosion, and retards soil moisture loss through evaporation.	
Southeastern Oregon	Habitat Restoration	Seedings will be implemented with appropriate mixes of adapted perennial species. Species mixes will be determined on a site-specific basis dependent on the probability of successful establishment, risks associated with seeding failure, and other management considerations. Preference will be toward the use of native species, though nonnative species may be used when better adapted to out-compete established annual species. Use of competitive native species or desirable nonnative species will be emphasized in seedings within sites moderately and highly susceptible to degradation. Treatment configuration will emphasize the maintenance of natural values as consistent with other resource management objectives. Note that the SEORMP specifically requires appropriate accordance with Manuals 6340 and 6330 for seedings in WSAs.	40
Southeastern Oregon	Habitat Restoration	Control methods will include preventive management to maintain competitive vegetation cover and reduce the distribution and introduction of noxious weed seed; manual and mechanical methods to physically remove noxious weeds; biological methods to introduce and cultivate factors that naturally limit the spread of noxious weeds; cultural practices; and application of chemicals. Target species will include those identified by county, state, and BLM weed priority lists.	41
Southeastern Oregon	Habitat Restoration	Shrub cover capable of supporting the life history requirements of sage-grouse and other wildlife that use sagebrush habitats (such as Classes 3, 4, and 5 from Table F-1)should be present at multiple scales, over a large area, and in a variety of spatial arrangements (such as at a landscape level and with connectivity present). This should include a central core of sagebrush habitat which is present in large contiguous blocks as well as some other habitat arrangements such as islands, corridors, and mosaic patterns. Each of these patterns has significance to wildlife within geographic areas. Wildlife objectives for sagebrush communities in individual pastures, allotments, and GMAs will be determined on the basis of factors such as: (1) presence of sage-grouse and their seasonal life history needs, (2) existing native shrub cover patterns and characteristics within each GMA, (3) the frequency and reasonably foreseeable likelihood of fire, and (4) locations of seedings and their shrub overstory conditions. Shrub cover should be present that shows some mix of height and age classes but with an overall emphasis on the presence of communities with shrubs in a mature structural status per Thomas et al. (1984).	Appendix F-5 at p F-6
Southeastern Oregon	Habitat Restoration	Restore, protect, and enhance the diversity and distribution of desirable vegetation communities, including perennial native and desirable introduced plant species.	38
Southeastern Oregon	Habitat Restoration	Upland native rangeland communities will be managed to attain a trend toward DRFCs based on management objectives and site potential. Management actions will maintain the condition of those native communities where vegetation composition and structure will be consistent with desired conditions and natural values. Nonnative seedings in poor or fair condition will be managed to restore production and vigor, as well as to improve structural and species diversity consistent with other management objectives. Nonnative seedings in good or excellent condition will be managed to maintain seeding health, improve structural and species diversity, and ensure continued forage production. Upland shrub cover across the landscape will be maintained at moderate to heavy levels of potential for wildlife cover values (see Appendix F, Table F-1) and structural diversity in most native vegetation communities where potential exists and in nonnative seedings as consistent with other resource management objectives.	39
Southeastern Oregon	Habitat Restoration	Manage to maintain or establish connectivity of big sagebrush types between GMAs at mid and fine scales. To achieve desired wildlife habitat conditions, management will include a variety of methods to maintain, increase, or decrease the big sagebrush overstory. (p.52) The following from Appendix F-6:	Appendix F-6 at p F-10

Plan	GRSG Topic	Description of Management	Page
		1. Restore rangelands that are depleted in structure and plant composition due to past uses, fires, and weed invasions. Restoration with multiple native species is preferable to using introduced species such as crested wheatgrass. However, if native species cannot be established because (1) native seed sources are not available, or (2) intense competition from other undesirable vegetation is very likely to limit the success in establishing natives, then introduced grasses with a shrub component (crested wheatgrass and shrubs) will be considered preferable to taking no rehabilitation action at all. Fire and weed threats to remaining areas of good quality native range need to be reduced or eliminated where possible. 2. Reduce the level of western juniper encroachment into rangeland sites that threaten sage-grouse as a result of habitat loss and hunting perches for avian predators. Use mechanical means, rather than fire, where the risk of exacerbating fire cycles associated with invasive species (such as cheatgrass) is high. 3. Modify landscape character in monotypic stands of sagebrush where there is reason to believe that such action would enhance wildlife habitat values and not further exacerbate problems associated with fragmentation. 4. Restore habitat complexity, diversity, and structure in at least portions of rangelands currently dominated by monoculture stands of adapted grasses (nonnative). This action is considered appropriate if the area is judged to be of substantial consequence to the connectivity of individual geographic areas and the outcome would benefit critically important wildlife habitats (such as areas of concentrated or otherwise highly significant wildlife use). 5. Delay the timing of certain crested wheatgrass retreatments (treatments for the purpose of encouraging more grass production) where the status of sage grouse winter use and breeding activity is uncertain. Prescribe treatments based on documented field survey data that address sage grouse absence or presence.	
Southeastern Oregon	Habitat Restoration	Use cultural practices to establish greenstrips in order to diminish the chances for further loss of quality sagebrush habitats to wildfire. This is especially true for quality sage grouse habitats that adjoin fire prone, cheatgrass-dominated areas.	
Southeastern Oregon	Habitat Restoration	The Preliminary SEORMP/Final EIS is based on adaptive management, which is a continuing process of planning, implementation, monitoring, and evaluation, to adjust management strategies to meet goals and objectives of ecosystem-based management. The concept of adaptive management uses the latest scientific information, site-specific information/data, and professional judgment to select the management strategy most likely to meet goals and objectives. The concept also acknowledges the need to manage resources under varying degrees of uncertainty as well as the need to adjust to new information. Through continually adjusting management strategies as needed, supported by monitoring or additional information, adaptive management will result in attainment of short- and long-term trend toward meeting objectives. Adaptive management provides the capability to respond quickly to monitoring data with consideration given to past season monitoring or preseason conditions.	111
Southeastern Oregon	Habitat Restoration	Management actions will be implemented to rehabilitate and/or vegetate plant communities that do not meet DRFCs due to dominance by annual, weedy, or woody species. Vegetation manipulation projects will be implemented primarily to direct trend toward desired conditions, improve structural and species diversity, and protect soil, water, and vegetation resources. Emphasis will be placed on the use of prescribed and wildland fire to regulate woody species dominance and direct vegetation composition toward desired conditions.	39
Steens	General Habitat	The BLM program documents and interagency plan/NEPA documents and decisions applicable to the CMPA (and AMU) include the following: Greater Sage-Grouse and Sagebrush-Steppe Ecosystems Management Guidelines (USDI et al. 2000b)	9
Steens	General Habitat	Actions to diversify structure and composition of selected nonnative seedings will be implemented consistent with other resource objectives. In Greater sage-grouse habitat or deer winter range or both, interseeding, preferably using locally obtained seed, to establish native plant species onto approximately 5,000 acres of nonnative seedings throughout the CMPA, will be utilized where vegetative species diversity is low. Low species diversity areas are those that are	30

Plan	GRSG Topic	Description of Management	Page
		predominantly crested wheatgrass, or have reverted to cheatgrass dominance, or have few herbaceous plants with an overstory of sagebrush. Other desirable nonnative species may be used in the seeding mix. Livestock grazing may be used to suppress competition and allow sagebrush establishment. In areas to be reseeded, coordination with permittees, the ODFW, and the USFWS will occur to set livestock grazing prescriptions on a site-specific basis. Emphasis of this project includes establishment of seedings on the north and west sides of Steens Mountain. Brushbeating of sagebrush in a mosaic pattern may be allowed on 50 percent of seeded areas where brush cover is high.	
Steens	General Habitat	In managing uplands, the BLM needs to consider the consequences and relationships of management to life history needs to wildlife. The Executive Order on the Responsibilities of Federal Agencies to protect Migratory Birds, the Greater Sage-Grouse and Sagebrush-Steppe Ecosystem Management Guidelines, the BLM National (or OR/WA State level) Sage-Grouse Habitat Conservation Strategy, and the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (when approved) give direction to protect or restore habitat for these species, many of which are Special Status Species.	36
Steens	General Habitat	Areas used by Greater Sage-Grouse and other Special Status Species will be identified in efforts orchestrated with the ODFW or USFWS. Habitat management will be coordinated across agency boundaries.	38
Steens	General Habitat	Big sagebrush habitat will be managed for benefit of Special Status Species and to meet DRC in most big sagebrush habitats throughout the CMPA. Big sagebrush habitat will be managed in accordance with the Migratory Bird Executive Order, Greater Sage-Grouse and Sagebrush-Steppe Ecosystem Management Guidelines, BLM National (or Oregon/Washington state level) Sage-Grouse Habitat Conservation Strategy and Greater Sage-Grouse Conservation Assessment and Strategy for Oregon when approved.	38
Steens	General Habitat	Unless specifically needed as a vegetation management tool, utilization levels as measured at the end of the growing season will not exceed 60 percent on nonnative seedings and 50 percent on native herbaceous forage plants, on a pasture average basis, except where lower use levels may be necessary to prevent detrimental effects on habitat quality for sage-grouse.	53
Steens	General Habitat	Increase species and structural diversity at the plant community and landscape levels in the big sagebrush communities. Provide multiple successional stages within the landscape.	30
Steens	General Habitat	Manage big sagebrush, quaking aspen, and western juniper plant communities to meet habitat requirements for wildlife.	31
Steens	General Habitat	Manage big sagebrush communities to meet the life history requirements of sagebrush-dependent species.	31
Steens	General Habitat	Big sagebrush, quaking aspen, and western juniper plant communities will be managed for the benefit of all wildlife and to meet the desired range condition (DRC) in most habitats throughout the CMPA.	31
Steens	General Habitat	Throughout the CMPA, approximately 5,000 acres of nonnative seedings and most native vegetation in deer winter range, where vegetative species diversity is low, will be interseeded to establish native plant species. Where appropriate, other desirable nonnative plant species may be used. Livestock grazing may be used to suppress competition and allow sagebrush establishment. In areas to be reseeded, coordination with permittees, the ODFW, and the USFWS will occur to set livestock grazing prescriptions on a site-specific basis.	34
Steens	General Habitat; Habitat Fragmentation	Big sagebrush habitat will be managed for shrub cover, structure, and forage values for the benefit of game and nongame wildlife. The DRC will include shrub cover values that meet or exceed the requirements described in Wildlife Habitats in Managed Rangelands (1984) and include big sagebrush distribution over a large enough area to avoid the adverse impacts of habitat fragmentation. The DRC will strive for big sagebrush overstories that emphasize the presence of mature, light-to-moderately stocked shrub canopies capable of supporting diverse herbaceous understories and are present in a variety of spatial arrangements important to wildlife. This will apply to most native range or seed areas in big sagebrush habitats throughout the CMPA.	unknown
Three Rivers	Sagebrush Removal	Now no big sagebrush removal within two miles of sage grouse strutting grounds when determined by a wildlife biologist to be detrimental to sage grouse habitat requirements.	2-75

Plan	GRSG Topic	Description of Management	Page
Upper Deschutes	General Habitat	Vegetation treatments to maintain or restore shrub-steppe communities will be based on a landscape level restoration of broad vegetative types. Priorities for treatment will focus on areas that will show the biggest ecological gain for a given level of treatment intensity or investment. Cost-benefit t ratios will help determine project priority and scale. Priorities will include restoration of sage-grouse and other special status species habitat. Areas that have transitioned beyond the threshold of restoration success with reasonable treatment effort and expense will normally receive lower priority.	31
Upper Deschutes	General Habitat	In coordination with other federal and state natural resource management agencies develop a long-term conservation strategy for managing sage-grouse habitats.	46
Upper Deschutes	General Habitat	Maintain existing shrub-steppe habitats in the existing sage grouse range in order to sustain sage-grouse populations and protect options for the future (Information Bulletin No. OR-200-334).	48
Upper Deschutes	General Habitat	Consider partnering with ODFW, OMD, USFWS, and others in developing a multispecies habitat conservation strategy for the Bend/Redmond, Horse Ridge, Mayfield Pond, Millican Plateau, North Millican, and Prineville Reservoir geographic areas. Focal species for this strategy are to include, but not be limited to sage-grouse, deer, elk, pronghorn, and golden eagles.	54
Upper Deschutes	General Habitat	Vegetative habitat needs of sagebrush-steppe obligate species will be emphasized in treatment design.	31
Upper Deschutes	General Habitat; Habitat Fragmentation	Where ecologically appropriate, restore or maintain stands of large contiguous sagebrush communities in patches of 400 acres and larger. Design of landscape patterns will include connectivity of large shrub-steppe patches.	31
Vegetation			
Andrews Management Unit (Andrews)	Conifer Encroachment	Reduce the influence of western juniper trees less than 120 years old to restore riparian and sagebrush habitats. Western juniper trees less than 120 years old may be cut in riparian areas and sagebrush plant communities.	29
Lakeview	Conifer Encroachment	When evaluating areas for western juniper treatment (including areas for commercial and public wood cutting), priority areas will be those areas where the western juniper is most adversely affecting other resources. These include quaking aspen groves, riparian areas, and Greater Sage-Grouse leks.	34
Steens Mountain Cooperative Management and Protection Area (Steens)	Conifer Encroachment	Reduce the influence of western juniper trees less than 120 years old to restore riparian and sagebrush habitats.	28
Southeastern Oregon	Forest and Woodlands	Western juniper management will be implemented to maintain commodity production, enhance resource values, and reduce western juniper dominance. Priority areas for western juniper treatments will be riparian/wetlands, quaking aspen stands, productive grasslands, forested areas, and shrublands where loss of vegetation diversity is likely. Treatments will be conducted to provide a mosaic pattern to meet wildlife habitat requirements. A maximum of 124,500 acres of western juniper will be treated during the life of the plan, using prescribed fire and/or mechanical treatment. Acres burned in wildfire situations will be included as part of acres treated (p. 43)	43
Southeastern Oregon	Conifer Encroachment	Habitats that support western juniper should provide the following kinds of characteristics important to wildlife: 3) Limited juniper presence in rangelands where sage-grouse forage and cover values are threatened or where	Appendix F-7, p. F11

Plan	GRSG Topic	Description of Management	Page
		predation by raptors may be affecting limited grouse populations. 6) Vegetation mosaics within project sites so that the result of treatments is approximately 50 percent juniper habitat and 50 percent shrub/grassland habitat. The patch size and layout of cover types resulting from projects (burning or cutting) is dependent upon wildlife that use the area and cover conditions within the geographic area being affected.	
Southeastern Oregon	Rangeland Vegetation	Upland shrub cover across the landscape will be maintained at moderate to heavy levels of potential for wildlife cover values (see Appendix F, Table F-1) and structural diversity in most native vegetation communities where possible and in nonnative seedings as consistent with other resource management objectives. The frequency, distribution, and ecological integrity of native stands of mountain shrubs will be restored and maintained where site potential will support these species. Appropriate Management Reponses (AMR) will be implemented on wildland fires to meet vegetation management and other objectives.	39
Livestock Grazing			
Southeastern Oregon	Objectives / Grazing in upland habitats	Grazing Considerations for Upland Habitats: Key grass forage species on native ranges should be grazed at stocking levels that allow for maintenance or improvement of plant vigor and recruitment of young plants. Native range should be grazed in such a way that a patchy appearance comprised of lightly to moderately grazed and ungrazed areas are prevalent throughout most of the pasture. The rangeland may be topped, skimmed, or grazed substantially in patches. In so doing, a combination of seasonally important habitat values important to wildlife will be present, including grazed (conditioned) forage plants and areas with high quality cover and structure (ungrazed or slightly grazed vegetation). Shrub overstories capable of supporting sage-grouse and other species that use sagebrush habitats should be present on at least 50 to 75 percent of the surface acreage of livestock management pastures capable of supporting big sagebrush communities. (p F-6)	Appendix F-3, F-4
Southeastern Oregon	Grazing practices	Unless specified with rationale, the following factors will be considered consistent with the protection of most wildlife habitat values in activity plans. Key area selection for monitoring activity plan performance (effectiveness monitoring) is based on habitat type, land-form, and/or fence locations at reasonable distances from water accessible to livestock or wild horses. One or more key species of wildlife and wildlife seasons of use need to be identified for activity plan evaluation purposes. 1) Grazing systems should incorporate periodic yearlong rest and/or growing season deferment. 2) Key grass forage species on native ranges should be grazed at stocking levels that allow for maintenance or improvement of plant vigor and recruitment of young plants. 3) Native range should be grazed in such a way that a patchy appearance comprised of lightly to moderately grazed and ungrazed areas are prevalent throughout most of the pasture. The rangeland may be topped, skimmed, or grazed substantially in patches. In so doing, a combination of seasonally important habitat values important to wildlife will be present, including grazed (conditioned) forage plants and areas with high quality cover and structure (ungrazed or slightly grazed vegetation). Livestock grazing described as a thorough search (heavy trampling, limited standing herbaceous cover, and uniformly grazed key forage plants) is limited to areas near watering facilities such as troughs and	Appendix F-3

Plan	GRSG Topic	Description of Management	Page
		reservoirs. Heavy utilization patterns do not dominate the appearance of the landscape and vegetation structure at the end of the growing season. Most young plants are undamaged subsequent to grazing use and low-value herbaceous plants are left ungrazed. 4) TNR livestock grazing use in native range should be avoided to protect forage, cover and structure values for wildlife. Where it is permitted for the attainment of other management objectives, TNR grazing use should conform to utilization levels that are less than or equal to 40 percent as defined in this document and BLM technical references. 5) Native upland range that is not grazed by domestic livestock is a desired wildlife habitat condition. It is generally in limited supply and typically provides very high quality structure and native forage for wildlife use. Maintenance of currently ungrazed native range conditions by avoiding new water developments, salting, and fencing is considered a beneficial mitigating measure for the protection of wildlife habitat values.	
Southeastern Oregon	Grazing practices	Livestock grazing will be managed during and following drought to maintain soil and vegetation health and productivity.	58
Southeastern Oregon	Grazing practices	Objective 2: Restore, maintain, or improve riparian vegetation, habitat diversity, and associated watershed function to achieve healthy and productive riparian areas and wetlands.	48
Three Rivers	Grazing Restrictions	Implement grazing systems on all sage-grouse ranges to improve forb production and availability.	2-63
Human Disturbance: general			
Upper Deschutes	General Habitat; Human Disturbance	a. Design and implement management activities to be consistent with adopted sage-grouse conservation strategies and current, accepted science. b. Vegetation-altering activities may occur in sage-grouse habitat where it does not result in the long-term loss of habitats or contribute to the need to list. c. Disturbance activities may occur in sage-grouse habitat if they do not disrupt breeding and over-wintering activities or compromise habitat suitability.	46
Brothers-Lapine	Human Disturbance	Sage-Grouse Spring-Summer-Fall Range: Projects will be limited to no more than 60 percent of the area in any 10-year period with emphasis on mosaic patterns, creation of edge, and retention of important cover.	89
Brothers-Lapine	Human Disturbance	Sage-Grouse Wintering Areas: These areas can only be considered for treatment after adequate consideration and planning have been given to the present and future wintering sage-grouse populations found in each specific area.	89
Brothers-Lapine	Human Disturbance	Seasonal restrictions will be applied to mitigate the impacts of human activities on important seasonal wildlife habitat. Examples of the major types of important seasonal wildlife habitat are crucial deer winter range, sage-grouse nesting habitat, and raptor nesting habitat.	97
Lakeview	Human Disturbance; Habitat Fragmentation	The high concentration of Greater Sage-Grouse leks in the High Lakes ACEC will be managed to maintain the continuity of Greater Sage-Grouse habitat and to avoid disturbance during the breeding season.	67
Human Disturbance: Recreation			
Upper Deschutes	OHV Restrictions	New trails and developments will be designed and constructed to avoid or minimize conflicts with known raptor and sage-grouse areas. Existing trails and developments will be managed to avoid or minimize conflicts with those areas which may be known or are identified in the future. Management in these areas may include trail closure, trail relocation, or season of use restrictions.	107

Plan	GRSG Topic	Description of Management	Page
Human Disturbance: Lands and Realty			
Upper Deschutes	Land and Realty	Prioritize parcels for acquisition to meet management objectives based on the potential for imminent development. These objectives could include the following considerations (note: these are not in order of priority): Parcels that contain important habitat for special status species and other species of high public interest or concern, including sage-grouse.	145
Lakeview	Human Disturbance: Lands and Realty	New rights-of-way (ROWs) will be avoided in Greater Sage-Grouse breeding habitat. Most of north Lake County will be designated as limited to existing roads and trails year-round to protect wildlife habitat.	50
Lakeview	Land and Realty	All ACECs, Wild and Scenic Rivers (WSRs), the Buck Creek Watchable Wildlife Site, and Greater Sage-Grouse breeding habitat will be designated ROW avoidance areas except for ROW that will not conflict with management objectives for the area (see Map L-8).	94
Andrews/ Steens	Human Disturbance: Lands and Realty	Wind energy development will be restricted from ROW, realty use, and renewable energy avoidance and exclusion zones as identified in the RMP and the portion of the Steen Mountain CMOA in the planning area.	Unknown
Three Rivers	Human Disturbance: Lands and Realty	It will be clarified that wind energy development is allowed on a case-by-case basis in areas outside rights-of-way and land use authorization avoidance and exclusion zones. Wind energy development will be restricted from rights-of-way and land use authorization avoidance and exclusion zones identified in the RMP and the portion of the Steens Mountain CMPA in the planning area.	Unknown
Lakeview	Human Disturbance: Lands and Realty	New rights-of-way will be avoided in GRSG breeding habitat (Map L-8). Most of north Lake County will be designated as limited to existing roads and trails year-round to protect wildlife habitat.	Unknown
Human Disturbance: Minerals, Oil and Gas			
AMU	Minerals, Oil and Gas	Areas that will be recommended for withdrawal under 43 CFR 2300 from locatable mineral exploration and development include existing BLM recreation and administrative sites, potential BLM recreation sites when development is approved, National Register-listed cultural sites, significant paleontological localities, areas containing federally listed species and designated critical habitat, and land within 0.6 mile of sage-grouse leks. Approximately 447,464 acres are open to locatable mineral exploration and development under a notice or plan of operation, and 20,367 acres are closed.	48
AMU	Minerals, Oil and Gas	Areas of seasonal or special stipulations include big game winter range, areas containing federally listed species and their designated critical habitat, and land within 0.6 mile of sage-grouse leks.	48
AMU	Minerals, Oil and Gas	Salable minerals development is permitted throughout the AMU on a case-by-case basis except on land closed by Congressional action and the Wilderness Study Area (WSA) IMP, in Areas of Critical Environmental Concern (ACECs), existing BLM administrative and recreation sites, potential BLM recreation sites, National Register-listed cultural sites, significant paleontological localities, areas containing federally listed species and their designated critical habitat, and within 0.6 mile of sage-grouse leks.	49
Brothers-Lapine	Human Disturbance; Minerals, Oil and Gas	The no surface occupancy stipulation on 16,480 acres around Prineville Reservoir and seasonal restrictions on 44,580 acres of deer wintering areas and 3,560 acres of sage-grouse strutting grounds would continue.	13

Plan	GRSG Topic	Description of Management	Page
Brothers-Lapine	Human Disturbance; Minerals, Oil and Gas	Sage-Grouse Habitat (2-Mile Radius of Strutting Grounds): Projects within the two-mile radius of strutting grounds will be planned for selective control in a manner that will not adversely impact present and future nesting sage grouse populations. Within the one-mile radius zone shrub reduction projects will be highly selective.	89
Lakeview	Human Disturbance; Locatable Minerals	About 1,647,544 acres will be open to locatable mineral development, but subject to a combination of protective stipulations, including: preparing a plan of operations, seasonal restrictions, and special visual design measures; primarily in areas of big game winter range, Greater Sage-Grouse breeding habitat, one suitable wild and scenic river, and Visual Resource Management Classes I and II (see Map M-10).	90
Lakeview	Human Disturbance; Mineral leasing	About 817,789 acres will be open to mineral leasing but subject to no-surface-occupancy restrictions, primarily in some ACECs and all Greater Sage-Grouse breeding habitat (see Map M-9).	91
Lakeview	Human Disturbance; Salable Minerals	About 676,150 acres of confirmed Greater Sage-Grouse breeding habitat will be included in the surface occupancy avoidance category (see Map M-8).	91-92
Lakeview	Human Disturbance; Mineral Leasing	Surface occupancy and use related to mineral leasing shall be prohibited within 0.6 mile of known or occupied breeding habitat.	A-175
Lakeview	Human Disturbance; Locatable Minerals	Special status species (Federal candidate/BLM sensitive) of plants and animals, and their habitat, will be identified by the resource area manager, and shall be avoided whenever possible.	A-178 to A-179
Lakeview	Minerals, Oil and Gas	About 676,150 acres of confirmed Greater Sage-Grouse breeding habitat will be included in the surface occupancy avoidance category.	91
Southeastern Oregon	Minerals, Oil and Gas	Timing limitations will be applied to land where the resource values (such as raptor nesting, sage-grouse leks, or big game winter range) cannot be adequately protected by the standard lease terms, but yet do not require a yearlong restriction on leasing operations. Less restrictive stipulations (such as controlled surface use or standard stipulations) were considered in developing this stipulation, but it was concluded that they would not afford sufficient protection to the known and suspected resources found on the parcels.	30
Southeastern Oregon	Minerals, Oil and Gas	There will also be areas where a seasonal or other special stipulation will be applied to protect values identified. These areas include some ACECs; a 0.5-mile buffer around sage-grouse leks; big game winter ranges; areas of special status plant and animal species and their essential habitat; and RCAs.	30
Southeastern Oregon	Minerals, Oil and Gas	Sage-grouse breeding activity could be disrupted by lease activity during the strutting season. A No Surface Occupancy stipulation will be applied within 0.5 mile of these sites between March 1 and June 1 of each year. The authorized officer may grant an exception to the stipulation if site-specific environmental analysis indicates that an action would not interfere with sage-grouse strutting. The authorized officer may modify the size and timeframes of the stipulation if monitoring indicates that current sage-grouse use patterns are inconsistent with dates established for animal occupation, or if the proposed action could be conditioned so as to not interfere with sage grouse strutting. This stipulation may be waived by the authorized officer if monitoring determines that all or specific portions of the lease area no longer satisfy this functional capacity.	34
Steens	Minerals, Oil and Gas	Saleable minerals development is permitted in the CMPA, for road maintenance only, at locations identified in the Steens Act. Those sites are outside Wilderness, WSAs, designated segments of the National WSR System, ACECs, existing BLM administrative and recreation sites, and potential BLM recreation sites. Development is not permitted in those parts of the sites that are within National Register-listed cultural sites, significant paleontological localities, areas	49

Plan	GRSG Topic	Description of Management	Page
		containing Federally listed species and their designated critical habitat, and within 0.6 mile of sage-grouse leks.	
Monitoring			
Baker	General Habitat; Monitoring	Continue inventories, develop and implement habitat management plans to protect or enhance important wildlife habitat for big game animals, native fisheries, bald eagles and other raptors, and native game birds including sage-grouse and Columbian sharp-tailed grouse.	ii
Baker	Monitoring	Continue inventories initiated on sage-grouse to determine nesting, brood rearing, and wintering habitat areas.	19
Lakeview	Monitoring	In conjunction with other private, state, or federal agencies, continue to monitor known populations of special status species considered to be sagebrush obligates (such as Greater Sage-Grouse, pygmy rabbit, and kit fox).	52
Lakeview	Monitoring	Annually or semiannually assess landscape changes in big sagebrush habitats from wildfire, prescribed fire, vegetation treatments, insect infestations, or other major influences. These changes will be mapped using global positioning system, geographic information system, and remote sensing technologies. The number of acres will be reported for each type of action. Assessments will be based on changes in size and composition of big sagebrush habitats. Changes will reflect suitability for sagebrush-dependent species. Big sagebrush and other wildlife habitats will be evaluated periodically during Rangeland Health Assessments and after major catastrophic events such as large-scale wildfire. Annually or biannually monitor areas where habitat treatments occur. Use photo points and vegetation sampling techniques that include species and structural composition of the area before and after treatment, if possible.	51
Southeastern Oregon	Monitoring / Adaptive Management	The concept of adaptive management uses the latest scientific information, site-specific information/data, and professional judgment to select the management strategy most likely to meet goals and objectives. The concept also acknowledges the need to manage resources under varying degrees of uncertainty as well as the need to adjust to new information. Through continually adjusting management strategies as needed, supported by monitoring or additional information, adaptive management will result in attainment of short- and long-term trend toward meeting objectives. Adaptive management provides the capability to respond quickly to monitoring data with consideration given to past season monitoring or preseason conditions.	111
Southeastern Oregon	Monitoring	Over the life of this plan, vegetation communities will be monitored to determine progress toward attaining DRFCs. Monitoring to determine success in meeting vegetation management objectives will include periodic measurements of plant composition, vigor, and productivity as well as measurement of the amount and distribution of plant cover and litter that protects the soil surface from raindrop impact, detains overland flow, protects the surface from wind erosion, and retards soil moisture loss through evaporation.	40
Three Rivers	Monitoring; General Habitat	1. Inventory all sage-grouse habitat for strutting grounds. 2. Ensure that sufficient sagebrush is retained on a case-by case basis via the National Environmental Policy Act (NEPA) process.	2-75
Upper Deschutes	Monitoring	Map the locations of active and historic important wildlife habitats (i.e., raptor nests, deer, elk and pronghorn winter range, sage grouse leks, etc.). Periodically monitor these habitats and survey potential habitats for additional activity. Map the land use activities that may cause negative impacts on these habitats.	51
Upper Deschutes	Monitoring	In conjunction with other private, state, or federal agencies, continue to monitor wildlife populations associated with source habitats in the planning area. Do this at several scales: - For individual species such as bald and golden eagles, sage-grouse, deer, elk, and pronghorn. - Groups of species associated with source habitats such as shrub-steppe, juniper, and ponderosa pine.	166
Special Designations – Areas of Critical Environmental Concern			
Southeastern Oregon	ACEC – surface disturbance	Most ACECs are identified as ROW Avoidance Areas, while the balance are Exclusion Areas. Additionally, most are proposed for withdrawal for Locatables and Closed or Withdrawn from Salables and Leasable minerals.	Table 13, p. 69

Plan	GRSG Topic	Description of Management	Page
Multiple RMPs			
	Livestock Grazing	Implement the *GRSG Programmatic Candidate Conservation Agreement for Livestock Grazing Practices on BLM Lands in Oregon*. Where there is also a Candidate Conservation Agreement with Assurances for private lands, BLM will coordinate with the private land owner who has a BLM grazing allotment permit.	Unknown
	Energy development	Record of Decision: Implementation of a Wind Energy Development Program and Associated Land Use Plan Amendments, dated 12/15/2005. The Land Use Plans that were updated included Andrews/Steens, Brothers/LaPine, SE Oregon, Three Rivers, Two Rivers, and Upper Deschutes RMPs.	Unknown
	Energy development	The Brothers/LaPine SE Oregon, Two Rivers, and Upper Deschutes RMPs state, "Programmatic policies and BMPs in the Wind Energy Development Program will be adopted."	Unknown

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Appendix C

Required Design Features for Alternatives B, C, D, and F

APPENDIX C
REQUIRED DESIGN FEATURES FOR ALTERNATIVES B, C, D, AND F

The following required design features (RDFs) for Greater Sage-Grouse conservation under Alternatives B, C, D, and F were derived from the best management practices (BMPs) in the National Technical Team (NTT) Report.

FLUID MINERALS DEVELOPMENT

Priority Habitats

1. 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 with right-of-way (ROW) holders.
    - Construct road crossings 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 (Lyon and Anderson 2003) 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 the ROW is 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. through use signing and gates)
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.

2. Operations

- Cluster disturbances, operations (e.g., fracture stimulation, and liquids gathering), 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 for the purpose of increasing the 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, minimizing perching and nesting opportunities for ravens and raptors and reducing 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 (e.g., power lines and pipelines) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Place power, flow, and small pipeline corridors under or immediately adjacent to roads.
- Design or site permanent structures that create movement (e.g. a pump jack) to minimize impacts on 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 through practices such as washing vehicles and equipment before they enter the site (Evangelista et al. 2011).
- 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 to 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 and design them to reduce noise that may be directed towards priority habitat.
- Clean up refuse (Bui et al. 2011).
- Locate human camps outside of priority habitats.

3. Reclamation
    - Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs during reclamation of 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 sites during interim reclamation, if necessary, for the purpose of establishing seedlings more quickly.
    - Utilize mulching techniques to expedite reclamation and to protect soils.

General Habitat

1. Roads
    - Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
    - Do not issue ROWs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
    - Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
    - Coordinate road construction and use with ROW holders.
    - Construct road crossing at right angles to ephemeral drainages and stream crossings.
    - Use dust abatement practices on roads and pads.
    - Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.
2. Operations
    - Cluster disturbances, operations (e.g., fracture stimulation and liquids gathering), and facilities.
    - Use directional and horizontal drilling to reduce surface disturbance.
    - Clean up refuse (Bui et al. 2010).

- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting) 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.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Control the spread and effects from non-native plant species by washing vehicles and equipment before they enter a site.
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

3. Reclamation
   - Include restoration objectives to meet sage-grouse habitat needs during reclamation (Pyke 2011). Address post-reclamation management in reclamation plan such that goals and objectives are to enhance or restore sage-grouse habitat.

FIRE AND FUELS

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 NEPA 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 existing fuels treatments that can be used to assist suppression activities.
9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by preliminary priority habitat (PPH) or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to PPH, but within two miles of PPH. The third priority for annual grassland habitat restoration projects are sites beyond two miles of PPH. 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 110 yards 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 installing fuel breaks and/or 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 PPH 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. 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. Involve state wildlife agency expertise in fire operations through:
    - instructing resource advisors during preseason trainings;
    - qualification as resource advisors;
    - coordination with resource advisors during fire incidents;
    - contributing to incident planning with information such as habitat features or other key data useful in fire decision making
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 (ATV) 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.

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Appendix D

Best Management Practices for Alternatives B, C, D, and F

APPENDIX D
BEST MANAGEMENT PRACTICES FOR ALTERNATIVES B, C, D, AND F

The following best management practices (BMPs) from the National Technical Team (NTT) Report are also BMPs for Alternatives B, C, D, and F in this RMPA/EIS.

LOCATABLE MINERAL DEVELOPMENT

1. 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 with 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 the ROW is for a temporary use consistent with all other terms and conditions included in this document.
    - Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing and gates).
    - Use dust abatement practices on roads and pads.
    - Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

2. 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 (e.g., power lines and pipelines) and transportation routes in existing utility or transportation corridors.
    - Bury power lines.
    - Cover (e.g., fine mesh netting) 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 human camps outside of priority sage-grouse habitats.

3. Reclamation
    - Include restoration objectives to meet sage-grouse habitat needs during reclamation. 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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Appendix E

Regional Mitigation Strategy

APPENDIX E
REGIONAL MITIGATION STRATEGY

Mitigation strategies, which take into account the mitigation hierarchy (avoid, minimize, restore, offset), are an important tool for ensuring the BLM meet their greater sage-grouse 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 will be tiered to the analysis and mitigation proposed throughout each of the action alternatives in this 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 sage grouse habitat and populations over time, as described in the Service's 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 greater sage-grouse and its habitat.

Any regional mitigation strategy for BLM managed lands will 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 will 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 State government working with the BLM as a Cooperating Agency on this land use plan amendment may have already completed, or is currently working on, statewide mitigation strategies. The BLM will continue to work with and support those State government efforts.

The BLM will establish a Mitigation Implementation Team for each of the six WAFWA Management Zones in the West, following the completion of each of the 15 sub-regional EISs 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 IV and V. The teams are responsible for developing a Mitigation Strategy consistent with BLM MS 1794, as appropriate. The teams will coordinate recommended mitigation strategies between RMP planning areas, WAFWA management zones, and local and state jurisdictions for mitigation consistency, where appropriate.

These implementation teams will 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. 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 zone.

These WAFWA Management Zone Implementation Teams will function as inter-disciplinary teams (IDTs) composed of BLM, FS, FWS and state fish and game agencies. The Mitigation Implementation Team will make recommendations to the BLM Authorized Officer. If the recommendations are rejected for any reason, the Mitigation Implementation Team will be re-convened to develop additional recommendations.

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Appendix F

Surface Stipulations Applicable to Fluid Mineral Leasing

APPENDIX F
SURFACE STIPULATIONS APPLICABLE TO FLUID MINERAL LEASING

This appendix lists by alternative surface stipulations for geothermal and oil and gas leasing referred to throughout this Resource Management Plan Amendment (RMPA) and Environmental Impact Statement (EIS). These surface stipulations would also apply, where appropriate and practical, to other surface-disturbing activities (and occupancy) associated with land use authorizations, permits, and leases issued on BLM-administered lands. The stipulations would not apply to other activities and uses where they are contrary to laws, regulations, or policy for specific land use authorizations. The intent is to manage other activities and uses as consistently as possible with geothermal and oil and gas leasing.

Surface-disturbing activities are those that normally result in more than negligible disturbance to public lands. These activities normally involve disturbance to soils and vegetation to the extent that reclamation is required. They include, but are not limited to, the use of mechanized earth-moving equipment; truck-mounted drilling equipment; geophysical exploration; off-road vehicle travel in areas designated as limited or closed to off-highway vehicle (OHV) use; placement of surface facilities such as utilities, pipelines, structures, and oil and gas wells; new road construction; and use of pyrotechnics, explosives, and hazardous chemicals. Surface-disturbing activities would not include livestock grazing, cross-country hiking, driving on designated routes, and minimum impact filming permits.

DESCRIPTION OF SURFACE STIPULATIONS

Table F-1, Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria, shows the stipulations for the alternatives, including exceptions, modifications, and waivers. Three surface stipulations could be applied to land use authorizations: (1) no surface occupancy (NSO), (2) timing limitations (TL), and (3) controlled surface use (CSU). There are no stipulations included for Alternatives C and F because they are closed to all geothermal and oil and gas

activities within occupied habitat. All stipulations for other resources, besides GRSG, included in the existing land use plans would still be applicable.

Areas identified as NSO would be closed to surface-disturbing activities for fluid minerals.

Areas identified as TL would be closed to surface-disturbing activities during identified time frames. TL areas would be open to operational and maintenance activities, including associated vehicle travel, during the closed period unless otherwise specified in the stipulation.

Areas identified as CSU would require proposals to be authorized only according to the controls or constraints specified. The controls would be applicable to all surface-disturbing activities.

EXCEPTIONS, MODIFICATIONS, AND WAIVERS

Surface stipulations could be excepted, modified, or waived by the Authorized Officer. An exception exempts the holder of the land use authorization document from the stipulation on a one-time basis. A modification changes the language or provisions of a surface stipulation, either temporarily or permanently. A waiver permanently exempts the surface stipulation. The environmental analysis document prepared for site-specific proposals such as geothermal and oil and gas development (i.e., applications for permit to drill [APD] or sundry notices) also would need to address proposals to exempt, modify, or waive a surface stipulation. To exempt, modify, or waive a stipulation, the environmental analysis document would have to show that (1) the circumstances or relative resource values in the area had changed following issuance of the lease, (2) less restrictive requirements could be developed to protect the resource of concern, and (3) operations could be conducted without causing unacceptable impacts.

STANDARD TERMS AND CONDITIONS

All surface-disturbing activities are subject to standard terms and conditions. These include the stipulations that are required for proposed actions in order to comply with the Endangered Species Act (ESA). Standard terms and conditions for geothermal and oil and gas leasing provide for relocation of proposed operations up to 200 meters and for prohibiting surface-disturbing operations for a period not to exceed 60 days. The stipulations addressed in Table F-1 that are within the parameters of 200 meters and 60 days are considered open to geothermal and oil and gas leasing subject to standard terms and conditions.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	Alternative A
No surface occupancy within 0.6 mile of known sage-grouse lek sites. Upper Deschutes RMP	**Exception:** An exception may be granted by the authorized officer if the operator submits a plan that demonstrates the proposed action will not affect sage-grouse or the lek site. **Modification:** The boundaries of the stipulated area may be modified if the authorized officer determines that a portion of the area can be occupied without adversely affecting sage-grouse or the lek site. **Waiver:** This stipulation may be waived if the authorized officer determines that there is no longer a lek site on the leasehold.
Leasable minerals will continue to be made available, [but with] seasonal restrictions on sage-grouse strutting grounds Brothers/La Pine RMP	**Exception:** No exceptions. **Modification:** No modifications. **Waiver:** No waivers.
Baker RMP (1996)–No specific sage-grouse stipulations. Standard stipulations and notices where not otherwise noted.	**Exception:** Stipulation specific. **Modification:** Stipulation specific. **Waiver:** Stipulation specific.
No surface occupancy (NSO) is allowed within 0.6 mile of sage-grouse leks between March 1 and June 1 of each year for leasable minerals. Andrews Management Unit RMP	**Exception:** No exceptions. **Modification:** Allowed if lek is no longer used by sage-grouse. **Waiver:** Allowed if lek is no longer used by sage-grouse.
Allow no sagebrush removal within 2 miles of sage-grouse strutting grounds when determined by a wildlife biologist to be detrimental to sage-grouse habitat requirements. Three Rivers RMP	**Exception:** The authorized officer can grant an exception to a specific activity if field inspection shows that grouse are not using the area and the proposed activities would not significantly degrade the habitat. An exception may be granted for operations conducted on existing roads with a high volume of traffic. **Modification:** A portion of the leased lands can be open to activity if field inspection shows that grouse are not using the area and the proposed activity would not significantly degrade the habitat. This stipulation can be expanded to cover additional portions of the lease if additional leks, habitat, or winter range areas are identified. **Waiver:** This stipulation can be waived when the available data show that the portion of the lease under the restriction no longer provides suitable habitat and grouse no longer use the area.
Timing limitation–This stipulation is applied to land where the resource values (such as raptor	**Exception:** No exceptions. **Modification:** No modifications.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
nesting, sage-grouse leks, or big game winter range) cannot be adequately protected by the standard lease terms, but yet do not require a yearlong restriction on leasing operations. Less restrictive stipulations (such as controlled surface use or standard stipulations) were considered in developing this stipulation, but it was concluded that they would not afford sufficient protection to the known and suspected resources found on the parcel(s). SE Oregon RMP	**Waiver:** No waivers.
There will also be areas where a seasonal or other special stipulation will be applied to protect values identified. These areas include some ACECs (Table 13, OWS); a 0.5-mile buffer around sage-grouse leks; big game winter ranges; areas of special status plant and animal species and their essential habitat; and RCAs. SE Oregon RMP	**Exception:** No exceptions. **Modification:** No modifications. **Waiver:** No waivers.
Sage-grouse breeding activity could be disrupted by lease activity during the strutting season. An NSO stipulation will be applied within 0.5 mile of these sites between March 1 and June 1 of each year. The authorized officer may modify the size and timeframes of the stipulation if monitoring indicates that current sage-grouse use patterns are inconsistent with dates established for animal occupation, or if the proposed action could be conditioned so as to not interfere with sage-grouse strutting. SE Oregon RMP	**Exception:** The authorized officer may grant an exception to the stipulation if site-specific environmental analysis indicates that an action would not interfere with sage-grouse strutting. **Modification:** The authorized officer may modify the size and timeframes of the stipulation if monitoring indicates that current sage-grouse use patterns are inconsistent with dates established for animal occupation, or if the proposed action could be conditioned so as to not interfere with sage-grouse strutting. **Waiver:** This stipulation may be waived by the authorized officer if monitoring determines that all or specific portions of the lease area no longer satisfy this functional capacity.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	Alternative B
Not applicable	PPMAs are closed to fluid mineral leasing
Same as Alternative A	PGMAs are open to fluid mineral leasing
	Alternative C
Not applicable	PPMAs and PGMAs are closed to fluid mineral leasing
	Priority Habitat – Alternative D (Oregon Alternative)
No surface occupancy in areas outside of GRSG habitat but within one mile of an occupied lek, when the lek is located within PPMA.	**Purpose:** To protect occupied GRSG leks and the life-history needs of GRSG in proximity of the lek from habitat loss and GRSG populations from disturbance inside and out of priority habitat areas. **Exception:** None. **Modification:** None. **Waiver:** A waiver may be granted if the lek is determined to be unoccupied as determined by ODFW.
No surface occupancy occupied habitat within 4 miles of a lek located within PPMA.	**Purpose:** To protect occupied GRSG leks and associated seasonal habitat, life-history, or behavioral needs of GRSG in proximity to leks, from habitat fragmentation and loss and GRSG populations from disturbance inside priority habitat areas and connectivity habitat areas. **Exception:** Within the mapped priority habitat there may be areas that lack the principle habitat components necessary for GRSG, including but not limited to rock outcrops, alkaline flats, pine/juniper ecological sites, or towns. These areas of non-habitat would be identified during site-specific project review by agency biologists, in discussion with ODFW and other agencies, as appropriate. Decisions associated with priority or general habitat would apply to areas with or ecologically capable of supporting GRSG habitat. The decisions may be excepted if it can be shown that the action would occur in a non-habitat area and the following conditions are met: • Access through GRSG habitat to the activity in the non-habitat area occurs only on existing routes, and no new roads, maintenance, or improvements to roads would be required within GRSG habitat, no activity would be permitted or authorized if it would establish a valid existing right that would subsequently require construction of new routes within GRSG habitat for access; • Access to the activity for construction, maintenance, etc. would be required to avoid applicable GRSG sensitive seasons (i.e., breeding, brood-rearing, winter) and time periods (2 hours before sunrise to 2 hours after sunrise near leks during breeding season);

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	• The non-habitat does not provide important connectivity between habitats; • Impacts to adjacent priority habitat areas can be reduced or eliminated (e.g., sound, tall structures). **Modification:** None. **Waiver:** A waiver may be granted if the lek is determined to be completely abandoned, destroyed, or occurs outside the initial identified area, as determined by the BLM and ODFW.
Priority habitat beyond 4 miles of an occupied lek, if the lek is located within priority habitat, would be designated as open to oil and gas leasing subject to controlled surface use stipulations (see list below) and the following timing stipulations: • Winter habitat from Nov 15 – Mar 15 • Brood rearing habitat from Apr 15 – Jul 15 • Breeding and nesting habitat from Feb 15 – Jun 15 – The development meets noise restrictions (noise at occupied leks does not exceed 10 decibels above ambient sound levels from 2 hours before to 2 hours after sunrise and sunset during breeding season); – The development meets tall structure restrictions (a tall structure is any man-made structure that has the potential to disrupt lekking or nesting birds by creating new perching/nesting opportunities and/or decrease the use of an	See below for Exceptions, Waivers, and Modifications per habitat.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
area; a determination as to whether something is considered a tall structure would be determined based on local conditions such as vegetation or topography); – Operators must submit a site-specific plan of development for roads, wells, pipelines, and other infrastructure prior to any development being authorized; this plan should outline how development on the lease will limit habitat fragmentation; and – The development does not exceed the 5% disturbance limit.	
PH beyond 4-mile NSO-**Winter Habitat TL** No surface disturbance allowed between November 15 – March 14, in winter habitat.	**Purpose:** To seasonally protect GRSG winter habitat areas from disruptive activities within priority habitat areas. **Exception:** Exceptions to the seasonal restrictions and use restrictions could be granted by the Field Manager under the following conditions: • If the project plan and NEPA document demonstrate that impacts from the proposed action can be adequately mitigated. **Modification:** The Field Manager may modify the seasonal restrictions and use restrictions under the following conditions: • If portions of the area do not include winter habitat (lacking the principle habitat components of winter GRSG habitat) or are outside the current defined winter GRSG areas, as determined by the BLM/FS in discussion with the ODFW, and indirect impacts would be mitigated; • If documented local variations (e.g., higher/lower elevations) or annual climactic fluctuations (e.g., early/late spring, long and/or heavy winter) reflect a need to change the given dates in order to better protect when GRSG use a given area.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	Waiver: None.
PH beyond 4-mile NSO- **Brooding Habitat TL** No surface disturbance allowed between April 15 – July 15, in GRSG brood-rearing habitat.	**Purpose:** To seasonally protect brood-rearing GRSG habitat from disruptive activity. **Exception:** Exceptions to the seasonal restrictions and use restrictions could be granted by the Field Manager under the following conditions: • If surveys determine that the lek is not active that year (based on ODFW lek survey protocol); • If surveys determine that the lek is no longer occupied, and the proposed activity will not take place beyond the season being excepted; • If the project plan and NEPA document demonstrate that impacts from the proposed action can be adequately mitigated. **Modification:** The Field Manager may modify the seasonal restrictions and use restrictions under the following conditions: • If portions of the area do not include brood-rearing habitat (lacking the principle habitat components of brood-rearing GRSG habitat) or are outside the current defined brood-rearing GRSG areas, as determined by the BLM in discussion with the ODFW, and indirect impacts would be mitigated; • If documented local variations (e.g., higher/lower elevations) or annual climactic fluctuations (e.g., early/late spring, long and/or heavy winter) reflect a need to change the given dates in order to better protect when GRSG use a given area. **Waiver:** None .
PH beyond 4-mile NSO- **Breeding and Nesting Habitat TL** No surface disturbance allowed between Feb. 15 – June 15, within breeding and nesting habitat (4-miles of a lek).	**Purpose:** To seasonally protect breeding and nesting GRSG habitat from disruptive activity in priority habitat areas. **Exception:** Exceptions to the seasonal restrictions and use restrictions could be granted by the Field Manager under the following conditions: • If surveys determine that the lek is not active that year (based on ODFW lek survey protocol), and the proposed activity will not take place beyond the season being excepted; • If surveys determine that the lek is no longer occupied, and the proposed activity will not take place beyond the season being excepted; • If the project plan and NEPA document demonstrate that

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	impacts from the proposed action can be adequately mitigated. **Modification:** The Field Manager may modify the seasonal restrictions and use restrictions under the following conditions: • If portions of the area do not include breeding and nesting habitat (lacking the principle habitat components of breeding and nesting GRSG habitat) or are outside the current defined area (therefore activity must be outside of the 4-mile lek buffer in PPMA), as determined by the BLM in discussion with the ODFW, and indirect impacts would be mitigated; • If documented local variations (e.g., higher/lower elevations) or annual climactic fluctuations (e.g., early/late spring, long and/or heavy winter) reflect a need to change the given dates in order to better protect when GRSG use a given area, and the proposed activity will not take place beyond the season being excepted. **Waiver:** None.
Surface occupancy or use within the 4-mile buffer of a lek outside of PPMA is subject to the following operating constraints: • The development meets noise restrictions (noise at occupied leks does not exceed 10 decibels above ambient sound levels from 2 hours before to 2 hours after sunrise and sunset during breeding season); and • The development meets tall structure restrictions (a tall structure is any man-made structure that has the potential to disrupt lekking or nesting birds by creating new perching/nesting opportunities and/or decrease the use of an area; a determination as to whether something is considered a tall structure	**Purpose:** To protect occupied GRSG leks and the life-history needs of GRSG of the lek from habitat loss and populations from disturbance outside of PPMA. **Exception:** None. **Modification:** None. **Waiver:** A waiver may be granted if the lek is determined to be unoccupied as determined by ODFW.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
would be determined based on local conditions such as vegetation or topography).	
Surface occupancy or use in occupied habitat is subject to the following operating constraints: • The development meets noise restrictions (noise at occupied leks does not exceed 10 decibels above ambient sound levels from 2 hours before to 2 hours after sunrise and sunset during breeding season); and • The development meets tall structure restrictions (a tall structure is any man-made structure that has the potential to disrupt lekking or nesting birds by creating new perching/nesting opportunities and/or decrease the use of an area; a determination as to whether something is considered a tall structure would be determined based on local conditions such as vegetation or topography).	**Purpose:** To protect occupied GRSG leks and the life-history needs of GRSG from habitat loss and GRSG populations from disturbance in PPMA. **Exception:** None. **Modification:** None. **Waiver:** None.
Operators must submit a site-specific plan of development for roads, wells, pipelines, and other infrastructure prior to any development being authorized; this plan should outline how development on the lease will limit habitat fragmentation before surface occupancy or use is allowed in habitat.	**Purpose:** To protect PPMA and the life-history needs of GRSG from habitat loss and GRSG populations from disturbance and limit fragmentation in PPMA. **Exception:** None. **Modification:** None. **Waiver:** None.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
Surface occupancy or use is not allowed within PPMA unless the area has not exceeded the 5% disturbance limit.	**Purpose:** To protect PPMA and the life-history needs of GRSG from habitat loss and GRSG populations from disturbance and limit fragmentation in PPMA. **Exception:** Small localized disturbance may exceed 5% if discrete disturbances are consolidated and localized and it is shown through an environmental compliance document that the total areas with discrete disturbances does not exceed 5% in the identified disturbance calculation area and that the consolidation of the disturbance in the area would be beneficial to the GRSG population. This could result in small areas where existing and proposed disturbances exceed 5% if total disturbances in the identified disturbance calculation area equals or is less than 5%. **Modification:** None. **Waiver:** None.
Surface occupancy or use is subject to the following special operating constraints: • Development is required to incorporate all design features identified in Appendix D (of the NTT Report).	**Purpose:** To protect occupied GRSG habitat and the life-history needs of GRSG from habitat loss and fragmentation and to limit GRSG habitat disturbance. **Exception:** An exception to this stipulation could be granted by the Authorized Officer unless one of the following is demonstrated through an environmental compliance document associated with the specific project: • A specific design feature is documented to not be applicable to the site-specific conditions of the project/activity; • A proposed design feature or best management practice is determined to provide equal or better protection for GRSG or its habitat; • Analyses conclude that following a specific feature will provide no more protection to GRSG or its habitat than not following it, for the specific project being proposed. **Modification:** None. **Waiver:** None.
General Habitat – Alternative D (Oregon Alternative)	
No surface disturbance within one mile of an occupied lek located within PGMA. This stipulation applies whether or not the area is within GRSG habitat.	**Purpose:** To protect occupied GRSG leks and the life-history needs of GRSG in proximity of the lek from habitat loss and GRSG populations from disturbance inside and out of PGMA. **Exception:** The Authorized Officer may grant an exception in coordination with ODFW during project implementation and if best management practices (e.g., anti-perch devices for raptors, etc.) are implemented. **Modification:** None.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	Waiver: Application of the above use restrictions and meeting objectives within general habitat may be waived by the Field Manager if off-site mitigation is successfully completed in priority habitat or opportunity areas, following discussion with BLM and ODFW. Even in situations where use restrictions are waived in general habitat, to avoid direct disturbance and/or mortality of birds, disturbances will not be approved during the sensitive seasons.
General habitat beyond 1 mile of an occupied lek, if the lek is within general habitat, would be designated as open to oil and gas leasing subject to CSU stipulations and the following timing stipulations: • Winter habitat from November 15 to March 15 • Brood rearing habitat from April 15 to July 15 • Breeding and nesting habitat from February 15 to June 15 Where leasing/development is allowed within general habitat, development could occur only if it adheres to the following controlled surface use stipulations: • The development meets noise restrictions (noise at occupied lek less than 10 decibels above ambient sound levels from 2 hours before to 2 hours after sunrise and sunset during breeding season). • The development meets tall structure restrictions (e.g., the human-made structure is not visible from the edge of the lek; determination of tall structure would be based	See Exceptions, Modifications, and Waivers below.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
on local conditions such as vegetation or topography). • Operators must submit a site-specific plan of development for roads, wells, pipelines, and other infrastructure prior to any development being authorized; this plan should outline how development on the lease will limit habitat fragmentation; General habitat within and beyond the 1 mile NSO area would require coordination with ODFW during project implementation and implementation of BMPs.	
GH- Beyond 1 mile NSO-**Winter Habitat TL**-No surface disturbance allowed between November 15 – March 14.	**Purpose:** To seasonally protect winter GRSG habitat from disruptive activity in PGMA. **Exception:** Exceptions to the seasonal restrictions and use restrictions could be granted by the Field Manager under the following conditions: • If the project plan and NEPA document demonstrate that impacts from the proposed action can be adequately mitigated. **Modification:** Additionally, the Field Manager may modify the seasonal restrictions and use restrictions under the following conditions: • If portions of the area do not include winter habitat (lacking the principle habitat components of winter GRSG habitat) or are outside the current defined winter habitat area, as determined by the BLM in discussion with the ODFW, and indirect impacts would be mitigated; • If documented local variations (e.g., higher/lower elevations) or annual climactic fluctuations (e.g., early/late spring, long and/or heavy winter) reflect a need to change the given dates in order to better protect when GRSG use a given area, and the proposed activity will not take place beyond the season being excepted.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	Waiver: None.
GH-Beyond 1 mile NSO-**Brood Rearing Habitat TL**-No surface disturbance allowed between April 15 – July 15.	**Purpose:** To seasonally protect brood-rearing GRSG habitat from disruptive activity in PGMA. **Exception:** Exceptions to the seasonal restrictions and use restrictions could be granted by the Field Manager under the following conditions: • If surveys determine that the lek is not active that year (based on ODFW lek survey protocol), and the proposed activity will not take place beyond the season being excepted; • If surveys determine that the lek is no longer occupied, and the proposed activity will not take place beyond the season being excepted; • If the project plan and NEPA document demonstrate that impacts from the proposed action can be adequately mitigated; **Modification:** Additionally, the Field Manager may modify the seasonal restrictions and use restrictions under the following conditions: • If portions of the area do not include habitat (lacking the principle habitat components of brood-rearing GRSG habitat) or are outside the current defined brood-rearing area, as determined by the BLM in discussion with the ODFW, and indirect impacts would be mitigated; • If documented local variations (e.g., higher/lower elevations) or annual climactic fluctuations (e.g., early/late spring, long and/or heavy winter) reflect a need to change the given dates in order to better protect when GRSG use a given area, and the proposed activity will not take place beyond the season being excepted. **Waiver:** None.
GH-beyond 1 mile NSO-**Breeding and Nesting Habitat TL**-No surface disturbance allowed between Feb. 15 – June 15.	**Purpose:** To seasonally protect breeding and nesting GRSG habitat from disruptive activity in PGMA. **Exception:** Exceptions to the seasonal restrictions and use restrictions could be granted by the Field Manager under the following conditions: • If surveys determine that the lek is not active that year (based on ODFW lek survey protocol), and the proposed activity will not take place beyond the season being excepted;

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
	• If surveys determine that the lek is no longer occupied, and the proposed activity will not take place beyond the season being excepted; • If the project plan and NEPA document demonstrate that impacts from the proposed action can be adequately mitigated. **Modification:** Additionally, the Field Manager may modify the seasonal restrictions and use restrictions under the following conditions: • If portions of the area do not include habitat (lacking the principle habitat components of GRSG habitat) or are outside the current defined breeding and nesting habitat area, as determined by the BLM in discussion with the ODFW, and indirect impacts would be mitigated; • If documented local variations (e.g., higher/lower elevations) or annual climactic fluctuations (e.g., early/late spring, long and/or heavy winter) reflect a need to change the given dates in order to better protect when GRSG use a given area, and the proposed activity will not take place beyond the season being excepted. **Waiver:** None.
Surface occupancy or use in occupied habitat is subject to the following operating constraints: • The development meets noise restrictions (noise at occupied leks does not exceed 10 decibels above ambient sound levels from 2 hours before to 2 hours after sunrise and sunset during breeding season). • The development meets tall structure restrictions (a tall structure is any man-made structure that has the potential to disrupt lekking or nesting birds by creating new perching/nesting opportunities and/or decrease the use of an	**Purpose:** To protect occupied GRSG leks and the life-history needs of GRSG of the lek from habitat loss and GRSG populations from disturbance outside of PGMA. **Exception:** None. **Modification:** None. **Waiver:** Application of the above use restrictions and meeting objectives within PGMA may be waived by the Field Manager if off-site mitigation is successfully completed in PPMA or opportunity areas, following discussion with BLM and ODFW. Even in situations where use restrictions are waived in general habitat, to avoid direct disturbance and/or mortality of birds, disturbances will not be approved during the sensitive seasons.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
area; a determination as to whether something is considered a tall structure would be determined based on local conditions such as vegetation or topography). • Environmental compliance documents associated with the activity consider how to limit habitat fragmentation.	
Surface-disturbing activities within GRSG would require coordination with ODFW during project implementation and implementation of best management practices (e.g., anti-perch devices for raptors, etc.)	**Purpose:** To minimize disturbance to GRSG within PGMA. **Exception:** None. **Modification:** None. **Waiver:** Application of the above use restrictions and meeting objectives within general habitat may be waived by the Field Manager if off-site mitigation is successfully completed in priority habitat or opportunity areas, following discussion with BLM and ODFW. Even in situations where use restrictions are waived in general habitat, to avoid direct disturbance and/or mortality of birds, disturbances will not be approved during the sensitive seasons.
Alternative E	
Core Area Habitat is closed, no stipulations apply. Low Density Habitat Stipulations: • Determine whether project will impact habitat and, if impacts are unavoidable, recommend habitat mitigation alternatives consistent with the Fish and Wildlife Habitat Mitigation Policy. • Appropriate set-back distances (thresholds) regarding density (number of units per area), size (total area disturbed), and noise levels of energy developments need	**Exception:** No exceptions. **Modification:** No modifications. **Waiver:** No waivers.

Table F-1
Fluid Mineral Stipulations and Exception, Modification, and Waiver Criteria

Stipulation	Stipulation Description
examination to determine effects on GRSG. Until better information is available, managers should err on the side of the birds' biology and use the greatest set-back distance where feasible and necessary.	
	Alternative F
Not applicable	PPMAs and PGMAs are closed to fluid mineral leasing

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Appendix G

Greater Sage-Grouse Monitoring Framework

APPENDIX G
GREATER SAGE-GROUSE MONITORING FRAMEWORK

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 land use plans in maintaining and restoring habitat conditions necessary to support sustainable Greater Sage-Grouse (GRSG) 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 BLM resource management plan (RMP) decisions to ameliorate threats to GRSG 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 each agency'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 GRSG, 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 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.

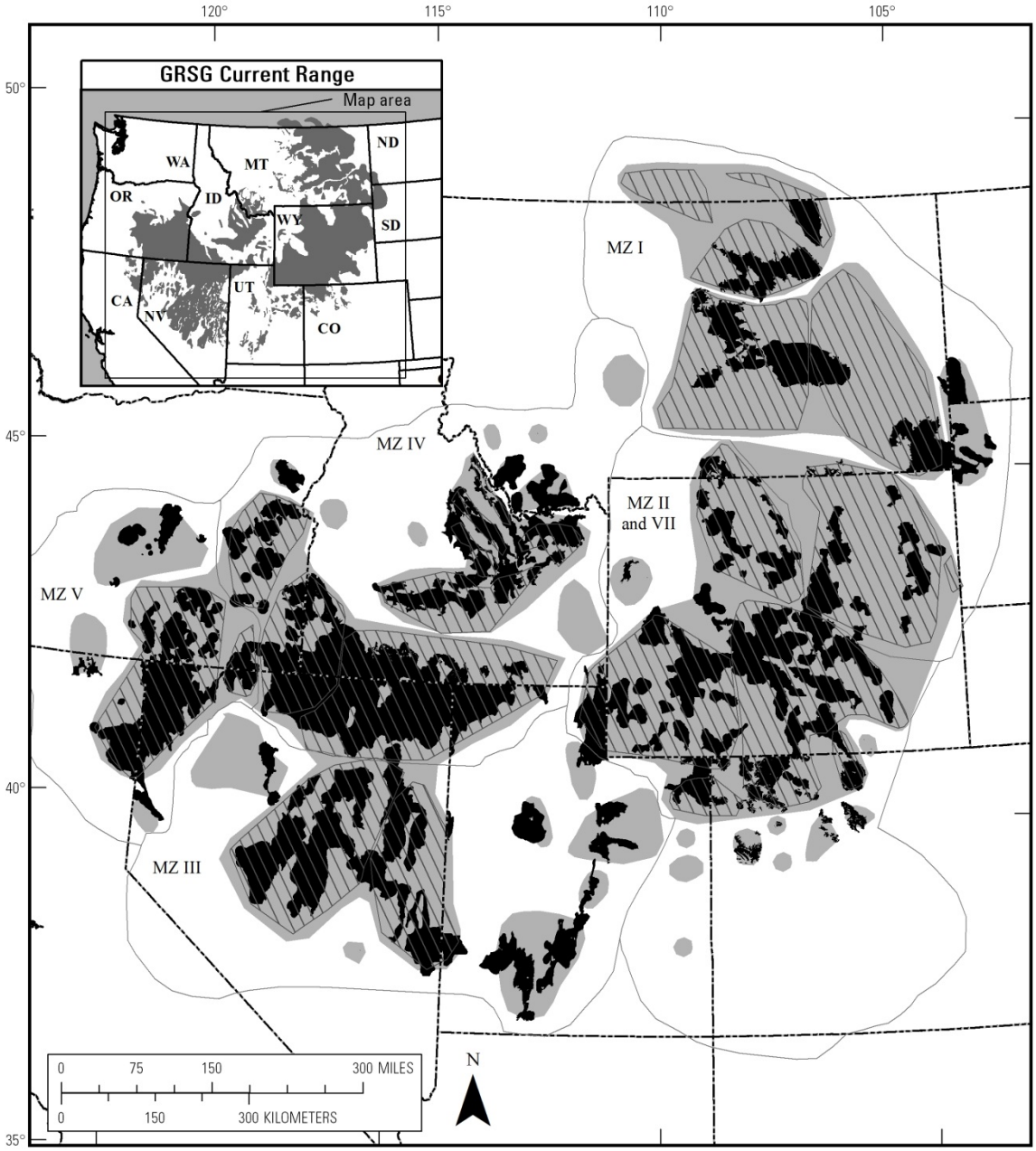
GRSG are a landscape species, and conservation is a scale-dependent process whereby priority landscapes are identified across the species range and appropriate conservation actions are implemented within seasonal habitats to benefit populations. Following guidelines established by multiple agencies in the Sage-Grouse Habitat Assessment Framework (HAF; Stiver et al. 2010), this approach uses the four orders of GRSG 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.

I. 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 GRSG 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 GRSG 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 G-1**; **Figure G-1**).



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

Figure G-1. Map of GRSG range, populations, subpopulations and Priority Areas for Conservation (PACs)

Table G-1
Indicators for Monitoring Implementation of Decisions, Greater Sage-Grouse Habitat, and Greater Sage-Grouse Populations at the Broad and Mid Scales

	Implementation	Habitat		Population (States)
Geographic Scales	**Decisions**	**Disturbance**	**Vegetation**	**Demographics**
Broad Scale: From the range of GRSG to WAFWA Management Zones	RMP/LMP 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, subpopulation, and PAC scale	RMP/LMP 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

A. Implementation (Decision) Monitoring

The regulations for the BLM (43 CFR 1610.4-9) require that land use plans 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. An Oregon Greater Sage-Grouse RMPA 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 plan.

B. Habitat (Vegetation) Monitoring

The current geographic extent of sagebrush vegetation within the rangewide distribution of GRSG 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 the BLM in 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 metrics 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 in 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 the Natural Resources Conservation Service [NRCS] on BLM lands (USDI-BLM 2011); AIM monitoring data (Toevs et al. 2011); and information presented under "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 GRSG habitat condition when combined with population data supplied by the states.

C. Habitat (Disturbance) Monitoring

Most of the decisions in this land use plan are in response to "Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range" in the US Fish and Wildlife Service's (USFWS's) 2010 listing decision for GRSG (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, saleable)
13. Infrastructure (roads)

14. Infrastructure (railroads)
15. Infrastructure (power lines)
16. Infrastructure (communication towers)
17. Infrastructure (other vertical structures)
18. Other developed rights-of-way

Cumulative disturbance monitoring will aggregate these 18 threats into the following three general measures (see Attachment A):

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 Section B. 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 GRSG 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.

D. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring GRSG 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 USFS, 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/MOUonGreaterSage-Grouse.pdf) could be revised to outline collaboration, process, and responsibilities for data analysis and transfer related to management of GRSG.

These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions.

E. 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 Oregon Sub-region 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 5-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 "Adaptive Management" section of the EIS).

II. 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 Oregon Sub-region 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/LMP 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 GRSG guidelines (Connelly et al. 2000) as well as the core indicators in the assessment, inventory and monitoring (AIM) strategy (Toevs et al. 2011), and applicable monitoring techniques. 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/ management zone where the data were collected and reflect local plant productivity and GRSG 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-reviewed outlet) and ecologically defensible (i.e., generally supported by the broad base of knowledge on sagebrush and GRSG provided in the peer-reviewed literature). When evaluating the land health habitat standard in designated GRSG habitats, the BLM will analyze core indicators and other supplemental site scale GRSG 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 US Geologic Survey.

III. 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 Oregon Sub-region RMPA Sage-grouse Monitoring Plan.

LITERATURE CITED

Connelly, J.W., S.T Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies, unpublished report, Cheyenne, Wyoming, USA. http://sagemap.wr.usgs.gov/docs/Greater_Sage-grouse_Conservation_Assessment_060404.pdf.

Endangered and threatened wildlife and plants; 12-month findings for petitions to list the greater sage-grouse (*Centrocercus urophasianus)* as threatened or endangered. Proposed Rule. 75 Fed. Reg. 13910 (March 23, 2010).

Garton, E.O., J.W. Connelly, J.S. Horne, C.A. Hagen, A. Moser, and M. Schroeder. 2011. Greater sage-grouse population dynamics and probability of persistence. Pp. 293 – 382 *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 (vol. 38). University of California Press, Berkeley, CA.

Homer, C.G., Aldridge, C.L., Meyer, D.K., Coan, M.J., and Bowen, Z.H., 2009, Multiscale sagebrush rangeland habitat modeling in southwest Wyoming: U.S. Geological Survey Open-File Report 2008–1027, 14 p.

Johnson, D. H. 1980. The comparison of usage and availability measurements for evaluating resource preference. Ecology 61:65-71.

Knick, S. T., and J. W. Connelly (editors). 2011. Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology Series (vol. 38), University of California Press, Berkeley, CA.

LANDFIRE. 2006.National existing vegetation type layer. USDI Geological Survey. http://gisdata.usgs.net/website/lanfire/ (21 August 2009).

Manier, D.J., D.J.A Wood, Z.H. Bowen, R.M. Donovan, M.J. Holloran, L.M. Juliusson, K.S. Mayne, S.J. Oyler-McCance, F.R. Quamen, D.J. Saher, and A.J. Titolo 2013. Summary of science, activities, programs, and policies that influence the rangewide conservation of greater sage-grouse (*Centrocercus urophasianus*):U.S. Geological Survey Open–File Report 2013–1098, 170 pp.

Schroeder, M.A., C.L. Aldridge, A.D. Apa, J.R. Bohne, C.E. Braun, S.D. Bunnell, J.W. Connelly, P.A. Deibert, S.C. Gardner, M.A. Hilliard, G.D. Kobriger, S.M. McAdam, C.W. McCarthy, J.J. McCarthy, D.L. Mitchell, E.V. Rickerson, and S.J. Stiver. 2004. Distribution of sage-grouse in North America. Condor 106: 363-376.

Stiver, S.J., A.D. Apa, J.R. Bohne, S.D. Bunnell, P.A. Deibert, S.C. Gardner, M.A. Hilliard, C.W. McCarthy, and M.A. Schroeder. 2006. Greater sage-grouse comprehensive conservation strategy. Western Association of Fish and Wildlife Agencies. Unpublished report. Cheyenne, WY, USA. http://www.wafwa.org/documents/pdf/GreaterSage-grouseConservationStrategy2006.pdf.

Stiver, S.J., E.T. Rinkes, and D.E. Naugle. 2010. Sage-grouse habitat assessment framework – a multi-scale habitat assessment tool. Bureau of Land Management Unpublished Report. U.S. Department of the Interior, BLM, Idaho State Office, Boise, ID. http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SG_HABITATASESSMENT0000669.pdf .

Toevs, G.R., J.J. Taylor, C.S. Spurrier, W.C. MacKinnon, and M.R. Bobo. 2011. Assessment, inventory, and monitoring strategy: For integrated renewable resource management. US Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.

US Department of the Interior. 2004. Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy. US Department of the Interior, Bureau of Land Management, Washington, DC.

United States Department of the Interior, Bureau of Land Management. 2011. BLM Memorandum of Understanding Washington Office 220-2011-02. BLM Washington Office, Washington DC.

US Fish and Wildlife Service. 2013. Greater sage-grouse (*Centrocercus urophasianus*) conservation objectives: final report. US Fish and Wildlife Service, Denver, CO.

Attachment A. Geospatial data layers used to determine three factors for Greater Sage-Grouse habitat disturbance monitoring at the broad and mid scales.

Geospatial Data Layer	Percent of Sagebrush	Percent of Non-habitat (Human Footprint)	Number of Energy and Mining Facilities
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-way		X	

Appendix H

GRSG Wildland Fire and Invasive Species Assessment

APPENDIX H
GRSG WILDLAND FIRE AND INVASIVE SPECIES ASSESSMENT

The following process is a suggestion for a consistent approach in conducting an assessment of the GRSG habitat and wildfire threat at the local planning area level. Variations to this approach may be made based on Interdisciplinary Team discussion or unique issues in a given planning area. This example format is intended to portray the degree of specificity required for offices which will complete these assessments. Note that this process has similarities to watershed analysis and ecoregional assessments, and as such these documents may prove useful where they exist.

INTRODUCTION

Greater Sage-Grouse (GRSG) Wildfire and Invasive Species Habitat Assessments (hereafter referred to as "stepdown assessments") are interdisciplinary evaluations of the threats posed by wildfire and invasive species, as well as identification of priority areas/treatment opportunities for fuels management, fire management, and restoration. Priority areas are spatial delineations where treatments, management actions, or other emphasis should be placed due to factors such as habitat quality, threats, or opportunities to protect, enhance, and restore GRSG habitat. The stepdown assessments will serve as a bridge between RMPs and project level planning, and will position planning efforts to conduct project-scale NEPA 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 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 and habitat classes (e.g., PPMA, PGMA, and/or PACs).
- Note: A summary map showing the planning area with habitat features is appropriate in Step 1. A tabular summary may also be included.

STEP 2: ISSUES AND KEY MANAGEMENT QUESTIONS

The purpose of this step is to devise management questions related to the issues of fuels management, fire management, and restoration. Note that this step should not answer each management question. Rather, management questions are answered in Step 4 through specific, quantified data.

Overview

- In coordination with state wildlife agencies, the USFWS, and your interdisciplinary team, develop an introductory section here that describes why fire or vegetation conditions pose a threat to GRSG in the local planning area. Describe where fire or vegetation conditions are a significant threat to GRSG habitat, and where fire, fuels, and restoration activities may help enhance habitat. In a brief paragraph or two, summarize the relationships between wildland fire, fuels management, and invasives/restoration in the planning area. Examples would include annual grass/wildfire cycle, juniper encroachment into GRSG habitat, recently disturbed areas, etc.

Key Management Questions

Issue #1: Fuels Management

- **In narrative format, develop management questions such as:**

  1. Based on fire risk to important GRSG habitats, what types of fuels treatments should be implemented that will reduce the risk? Where should fuels treatments be prioritized, and what is 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, PPMA, 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 land use plan 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 PPMA, 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 feet in elevation, and in a 16-inch or greater precipitation zone.
  3. What are the criteria for defining priority restoration areas? An example would be recent burns, moderately disturbed sites, or recovering allotment pastures which have not crossed ecological thresholds or become highly degraded. These may or may not be covered by existing emergency stabilization and rehabilitation (ESR) plans.
  4. Are there opportunities to utilize a coordinated approach across jurisdictional boundaries?

STEP 3: CURRENT CONDITIONS AND TRENDS

The purpose of this step is to develop information relevant to the issues and key questions identified in Step 2. It provides a snapshot of the present condition, statement of causal factors, and a summary of the trends which are occurring.

Biological Summary of Vegetation, Invasive Species, and Fire Regimes

[In this introductory section, provide a general biological summary of the planning area. Provide a narrative description of ecological trends, including description of plant communities, fire regimes, and other dominant biological factors affecting GRSG habitat.]

- Describe how fire has influenced current vegetation patterns. Are there large areas of even-aged communities, fine-scale mosaics, or annual grass monocultures?
- Describe if fire regimes are intact, or if they are altered. If they are altered, describe why. Use fire regime variables such as fire frequency, severity, or size to elucidate your points.
- Describe dominant cover types making up the planning area. These can be broad seral stage groupings, general lifeforms, or more fine-scale

information such as plant associations, habitat types, or ecological systems. Note: this information should be available in the RMP.

- What has been the impact of fire exclusion (e.g., increased conifer encroachment, 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 have past fuels management influenced today's planning area (e.g., creation of mosaics, protecting certain features, increasing invasives, etc.)?
- What are causal factors that 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 that are present in the planning area.
- Describe landscape conditions that 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 that 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; and
  - 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); and
  - 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 5 years?

Appendix I

Greater Sage-Grouse Habitat Density in Areas of Critical Environmental Concern

APPENDIX I
GREATER SAGE-GROUSE HABITAT DENSITY IN AREAS OF CRITICAL ENVIRONMENTAL CONCERN

DATE

May 31, 2013

GOAL

Utilize a network of existing Areas of Critical Environmental Concern (ACECs) to serve as conservation areas to manage sage grouse and sage brush habitat within Eastern Oregon. Maintain, improve, or increase quality and quantity of native plant communities in GRSG habitat within ACECs, including Research Natural Areas (RNAs), while maintaining or improving the all the values for which the ACECs/RNAs were designated. [Under all alternatives, all existing ACECs will remain, although there may be some changes in management focus. Under Alternative C, an additional 4 million acres (all of PPMA) would be designated as ACEC, and under Alternative F, an additional 2.5 million acres of PPMA and 1.2 million acres of PGMA would be designated as ACEC. In Alternatives A, B, D, and E, existing ACECs would continue, and would not be expanded.]

OBJECTIVES

- Prioritize conservation actions, habitat maintenance and habitat restoration in priority ACECs and RNAs for GRSG. These priority ACECs contain high amounts of quality sage-grouse habitat, either primary (PPH) or general habitat (PGH), and known GRSG populations or leks (see **Table I-1**, Existing Identified ACECs), as well as other identified resource values outlined in the various RMPs. Manage non-sage-grouse ACECs (ACECs outside the range of the sage grouse) for the values for which they were previously designated per District Resource Management Plans following existing management actions described in the plans.

- Research Natural Areas: Of the priority ACECs, manage the subset of RNAs that occur in PPH as undisturbed vegetative reference areas for the plant community cells they represent that are important for GRSG. Utilize RNAs as part of a national interagency network of natural areas that contain important ecological and scientific values and manage them for minimum human disturbance. Manage to preserve examples of all significant natural ecosystems and plant communities important for GRSG, for comparison with those influenced by man and BLM actions; and to provide educational and research areas for ecological and environmental studies, as well as to preserve gene pools of typical and rare plants and animals.

EXISTING AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Within the eastern Oregon planning area there are 92 existing ACECs occurring on 715,049 acres, or about 5.3 percent of 13.6 million acres of BLM-administered lands. These ACECs were previously designated in the various RMPs. There are 76ACECs (658,422 acres) that occur wholly or partially within the range of GRSG (i.e., in PGH and/or PPH). In order to prioritize management and to have utility for GRSG conservation, a subset of all existing ACECs was selected as priority ACECs based on having at least 50 percent in PGH, at least 30 percent in PPH, and/or active leks and sagebrush habitat. The following 59 existing ACECs (including 42 RNAs) occur within the 4 districts on 474,657 acres, and contain 225,731 acres of PGH (4.0 percent) and 197,680 acres of PPH (4.5 percent).

Table I-1
Existing Identified ACECs (GIS Acre Analysis)

ACEC Name	Type	District	Non-Habitat (acres)	PGH (acres)	PPH (acres)	% of ACEC in Habitat	Total (acres)
Big Alvord Creek	RNA	Burns	0	1,677	0	90%	1,677
Biscuitroot	ACEC	Burns	0	911	5,613	100%	6,524
East Fork Trout Creek	RNA	Burns	0	0	361	100%	361
East Kiger Plateau	RNA	Burns	309	907	0	75%	1,216
Fir Groves	ACEC	Burns	0	172	307	100%	479
Kiger Mustang	ACEC	Burns	1,525	26,288	27,776	97%	55,589
Little Blitzen	RNA	Burns	0	2,255	0	100%	2,255
Little Wildhorse Lake	RNA	Burns	0	241	0	100%	241
Long Draw	RNA	Burns	0	441	0	100%	441
Mickey Basin	RNA	Burns	0	560	0	100%	560
Mickey Hot Springs	ACEC	Burns	0	42	0	100%	42
Pueblo Foothills	RNA	Burns	0	2,424	0	100%	2,424

Table I-1
Existing Identified ACECs (GIS Acre Analysis)

ACEC Name	Type	District	Non-Habitat (acres)	PGH (acres)	PPH (acres)	% of ACEC in Habitat	Total (acres)
Rooster Comb	RNA	Burns	0	683	0	100%	683
Serrano Point	RNA	Burns	153	527	0	78%	680
Silver Creek	RNA	Burns	541	1,393	0	72%	1,934
South Fork Willow Creek	RNA	Burns	0	186	0	100%	186
Alvord Desert	ACEC	Burns	2,244	19,383	0	90%	21,627
Foster Flat[1]	RNA	Burns	0	0	2,686	100%	2,686
Abert Rim	ACEC	Lakeview	2,889	3,172	11,977	84%	18,038
Black Hills	RNA	Lakeview	0	3,048	0	100%	3,048
Devils Garden Lava Beds	ACEC	Lakeview	12,803	15,440	0	55%	28,243
Fish Creek Rim	RNA	Lakeview	1,592	1,241	5,885	82%	8,718
Foley Lake	RNA	Lakeview	0	0	2,228	100%	2,228
Guano Creek-Sink Lakes	RNA	Lakeview	0	0	11,185	100%	11,185
Hawksie-Walksie	RNA	Lakeview	107	13,434	3,766	99.4%	17,307
High Lakes	ACEC	Lakeview	0	0	38,942	100%	38,942
Juniper Mountain	RNA	Lakeview	0	6,330	0	100%	6,330
Lost Forest	RNA	Lakeview	537	8,385	0	94%	8,922
Rahilly-Gravelly	RNA	Lakeview	65	476	18,139	99.7%	18,680
Red Knoll	ACEC	Lakeview	10	809	10,302	99.9%	11,121
Spanish Lake	RNA	Lakeview	162	566	3,978	96.6%	4,706
Table Rock	ACEC	Lakeview	399	4,740	0	92.2%	5,139
Horse Ridge	RNA	Prineville	0	609	0	100%	609
Benjamin	RNA	Prineville	0	637	0	100%	637
Black Canyon	RNA	Vale	0	1,080	1,561	100%	2,641
Castle Rock	ACEC	Vale	0	12,208	10,654	100%	22,862
Coal Mine Basin	RNA	Vale	0	0	756	100%	756
Dry Creek Bench	RNA	Vale	0	0	1,637	100%	1,637
Dry Creek Gorge	ACEC	Vale	0	12,209	3,833	100%	16,042
Hammond Hill Sand Hills	RNA	Vale	0	3,716	0	100%	3,716
Honeycombs	RNA	Vale	1,610	14,258	0	90%	15,868
Jordan Craters	RNA	Vale	16,039	5,452	9,868	49%	31,359
Keating Riparian	RNA	Vale (Baker)	320	682	1,172	85%	2,174
Lake Ridge	RNA	Vale	0	0	3,860	100%	3,860
Leslie Gulch	ACEC	Vale	177	11,505	0	98%	11,682
Little Whitehorse Creek	RNA	Vale	0	0	61	100%	61
Mahogany Ridge	RNA	Vale	0	136	545	100%	681
Mendi Gore Playa	RNA	Vale	0	149	0	100%	149

Table I-1
Existing Identified ACECs (GIS Acre Analysis)

ACEC Name	Type	District	Non-Habitat (acres)	PGH (acres)	PPH (acres)	% of ACEC in Habitat	Total (acres)
North Fork Malhuer River	ACEC	Vale	0	1,199	614	100%	1,813
North Ridge Bully Creek	RNA	Vale	0	0	1,569	100%	1,569
Owyhee Views	ACEC	Vale	9,709	42,620	176	81%	52,505
Palomino Playa	RNA	Vale	0	47	599	100%	646
Powder River	ACEC	Vale (Baker)	0	0	5,909	100%	5,909
Saddle Butte	ACEC	Vale	55	1,725	5,316	99.2%	7,096
South Bull Canyon	RNA	Vale	0	0	790	100%	790
South Ridge Bully Creek	RNA	Vale	0	0	621	100%	621
Spring Mountain	RNA	Vale	0	0	996	100%	996
Stockade Mountain	RNA	Vale	0	1,768	0	100%	1,768
Toppin Creek Butte	RNA	Vale	0	0	3,998	100%	3,998
Total Acres	**59 ACECs**		**51,246**	**225,731**	**197,680**	**89.2%**	**474,657**

[1] 2012 fire may have changed area around Foster Flat

EXISTING PRIORITY RNAS

The 22 priority RNAs listed in **Table I-2**, Existing Priority RNAs for Long-Term Monitoring are a subset of the priority list of ACECs (see Table I-1) and occur on 117,657 acres, and will be managed as undisturbed vegetative baseline reference areas for the sagebrush plant community cells that are important for GRSG, and as baseline areas to monitor the effects from climate change on sagebrush ecosystems. These RNAs were selected as they have greater than 50 percent PGH, 30 percent PPH, and/or active leks, and contain important plant community types for the GRSG. These RNAs make up 23,114 acres of PGH (0.4 percent) and 76,261 acres of PPH (1.7 percent). Of the 22 RNAs, 13 (60 percent) are completely within PPH.

Table I-2
Existing Priority RNAs for Long-Term Monitoring

ACEC Name	Type	District	Non-Habitat	PGH	PPH	% of RNA in Habitat	Total
East Fork Trout Creek	RNA	Burns	0	0	361	100%	361
Foster Flat	RNA	Burns	0	0	2,686	100%	2,686

Table I-2
Existing Priority RNAs for Long-Term Monitoring

ACEC Name	Type	District	Non-Habitat	PGH	PPH	% of RNA in Habitat	Total
Fish Creek Rim	RNA	Lakeview	1,592	1,241	5,885	82%	8,718
Foley Lake	RNA	Lakeview	0	0	2,228	100%	2,228
Guano Creek-Sink Lakes	RNA	Lakeview	0	0	11,185	100%	11,185
Hawksie-Walksie	RNA	Lakeview	107	13,434	3,766	99%	17,307
Rahilly-Gravelly	RNA	Lakeview	65	476	18,139	99%	18,680
Spanish Lake	RNA	Lakeview	162	566	3,978	97%	4,706
Black Canyon	RNA	Vale	0	1,080	1,561	100%	2,641
Coal Mine Basin	RNA	Vale	0	0	756	100%	756
Dry Creek Bench	RNA	Vale	0	0	1,637	100%	1,637
Jordan Craters	RNA	Vale	16,039	5,452	9,868	49%	31,359
Keating Riparian	RNA	Vale	320	682	1,172	85%	2,174
Lake Ridge	RNA	Vale	0	0	3,860	100%	3,860
Little Whitehorse Creek	RNA	Vale	0	0	61	100%	61
Mahogany Ridge	RNA	Vale	0	136	545	100%	681
North Ridge Bully Creek	RNA	Vale	0	0	1,569	100%	1,569
Palomino Playa	RNA	Vale	0	47	599	100%	646
South Bull Canyon	RNA	Vale	0	0	790	100%	790
South Ridge Bully Creek	RNA	Vale	0	0	621	100%	621
Spring Mountain	RNA	Vale	0	0	996	100%	996
Toppin Creek Butte	RNA	Vale	0	0	3,998	100%	3,998
Total RNAs (22)			**18,285**	**23,114**	**76,261**	**84%**	**117,660**

SPECIAL MANAGEMENT ATTENTION AND MANAGEMENT ACTIONS

The following proposed management actions/special management attention is common to all the 59 existing ACECs/RNAs.

General: Prepare, update, and revise ACEC and RNA management plans, addressing needs of GRSG within sage-grouse habitat following direction in BLM Manual 1613. Coordinate with the Interagency Natural Area Committee on preparation of RNA plans and vegetation monitoring protocols (Gen Tech. Report PNW-GTR-798, July 2009), especially for the 22 priority RNAs. Coordinate establishment of long-term monitoring in priority RNAs with USFWS and ODFW.

Reduce, modify, or eliminate anthropogenic impacts and disturbances within existing identified ACECs that are listed as primary factors the US Fish and

Wildfire Service considered in their listing determination, namely habitat loss from fire and degradation of habitat from invasive species; energy development and corridors; and sage-grouse habitat loss. Reduce, modify, or eliminate vegetation impacts and fragmentation from OHVs, ROWs, authorized livestock grazing, locatable and saleable mineral authorizations, special use permits, and other actions that reduce habitat suitability for GRSG within ACECs and continue to trend the species to federal listing. For priority RNAs, allow natural processes to predominate with minimal human impact or intervention. However, respond to catastrophic disturbances such as wildfire and insect and disease outbreaks, in a way that meets long term goals for the RNA, the plant community cell, and the needs of GRSG.

Livestock Grazing

Maintain a suitable habitat rating per Stiver et al. (2011) for all seasonal GRSG habitats within the proposed ACEC, to meet vegetative objectives for sage-grouse, especially in riparian habitats to protect late brood rearing and summer habitat. Use grazing in ACECs where necessary as a restoration tool to combat noxious weeds or to meet specific vegetation objectives for sage-grouse. If authorized grazing is not meeting the suitable rating for sage-grouse within identified ACECs, work with grazing permit holder to modify the grazing system, adjust the timing, duration and intensity, reduce AUMs, or relinquish grazing allotments; terminate leases if necessary.

In the priority RNAs, work with grazing permit holders to voluntarily relinquish permits, and terminate grazing leases, with a goal of removing all existing permitted grazing in RNAs within 5 years. Remove un-needed infrastructure (corrals, interior fences, and water developments) as necessary.

Wild Horse and Burros

Manage wild horse and burros with existing and proposed ACECs such that adverse effects to habitat are minimized within 3 miles of active leks by adjusting AML in PPMA to attain suitable habitat condition rating.

ROWs

In general, establish ROW avoidance areas within ACECs and especially within 2 miles of active leks or in priority RNAs. New ROWs should not be allowed within existing or proposed ACECs/RNAs.

Manage existing ROWs where the BLM has discretion to reduce impacts to sage grouse in proposed ACECs, especially within 2 miles of active leks. Work with public holders of existing valid ROWs to address conservation of GRSG, the values that the ACEC/RNA was designated, and the maintenance and protection of RNA plant community cells from introduction of noxious weeds or wildfire.

OHVs

From March 1 through June 30, close ACECs to public OHV use, except for permitted and BLM administrative use. From July to February, limit OHVs in

existing and proposed ACECs to existing roads and trails. Within priority RNAs, close public OHV access, except for BLM administrative or permitted use.

Recreation

Minimize issuance of recreational permits within ACECs. Do not issue recreational actions (SRPs and RUPs) for activities within 2 miles of active leks within proposed ACECs.

No facilities (i.e., kiosks, toilets, signs, etc.) will be constructed in proposed ACECs within 2 miles of leks to minimize disturbance during the breeding season.

No recreation permits should be issued for priority RNAs.

Allow passive non-permitted activities such as hiking, bird watching, hunting, fishing, wildlife observation, and photography in ACECs and RNAs as long as there are no impacts to GRSG or the ACEC values.

Mining

Following existing mining regulations, initiate plans of operations for active mining within proposed ACECs. Work with the claimant to conserve leks, brooding, summer, and wintering habitat, and to restore grasslands and sagebrush communities following mining activity.

Where possible, pursue mineral withdrawal in ACECs according to 43 CFR § 2310.

Close ACECs to mineral material disposal for saleable minerals, subject to valid existing rights.

Fuels/Fire

Use fuels treatments and prescribed burning to protect priority ACECs from large-scale catastrophic fire and to maintain the sagebrush and native communities on which sage-grouse depend. This may include strategic treatments adjacent to and along the boundaries, or within strategic areas within the ACECs, to create fuel breaks and improve habitat and patch size for sage-grouse so long as the treatments do not detract from the values for which the ACEC was designated.

Fuels treatments for priority RNAs will be done only to protect the plant community cell for which the RNA was designated; natural successional processes will be allowed to occur within the plant communities within the RNAs with the exception of catastrophic wildfire (see below).

Fire suppression will be a priority to keep wildfire from burning ACECs in sage-grouse habitat, following specific tactics outlined in ACEC/RNA and fire

management plans. All fire suppression techniques will be used to suppress fires within ACECs, with consideration to minimize affects to the values that the ACEC was designated. Do not place fire camps and major staging areas within ACECs.

For identified RNAs use minimal 'light on the land' fire suppression techniques, similar to fire management on lands under wilderness review, including using hand lines, power tools, and fire retardant and aircraft as necessary. However, depending on existing fire behavior and fire risk, threats to life and private lands, BLM line officers may authorize more aggressive and ground-disturbing activities, including the use of earth moving equipment, or the use of backfires to burn through RNAs in extreme cases.

Restoration

Areas within the proposed ACEC that contain crested wheatgrass, nonnative annual grass, and listed noxious weeds are a priority for restoration back to functioning diverse native plant community, including the reintroduction of sagebrush, native grasses, and native forbs important for sage-grouse. Restoration includes the use of herbicides and all methods to combat BLM-listed noxious weeds and nonnative annual grasses, as long as the treatment does not impact the values for which the ACEC/RNA was designated.

Juniper removal and fuels treatments that benefit sage-grouse and the habitat in the long term are a priority within proposed ACECs. Burned area rehabilitation and restoration is also a priority within ACECs to restore the sagebrush community for sage-grouse using native species appropriate to the ecoregion.

Monitoring

Within ACECs and RNAs, establish replicated, statistically valid vegetation monitoring for sage-grouse. In priority ACECs monitor areas utilized by livestock, OHV, and other 'anthropogenic impacts and disturbances', including areas undergoing rehabilitation and restoration, to assess that vegetation objective for sage-grouse and the protection of the ACEC values are being met. Within RNAs the replicated, statistically valid long-term vegetation monitoring will serve as reference baseline condition for monitoring in managed areas (including other ACECs), and to document shifts in vegetation in the absence of anthropogenic disturbance (including permitted grazing), and climate change, and to research sage-grouse vegetative needs and vegetation processes. Annually provide the results to the USFWS, partners, and the public.

Appendix J

Areas of Critical Environmental Concern Evaluation for Greater Sage-Grouse

APPENDIX J
AREAS OF CRITICAL ENVIRONMENTAL CONCERN EVALUATION FOR GREATER SAGE-GROUSE

INTRODUCTION

During the scoping process for this RMPA/EIS the BLM invited the public to nominate or recommend areas on public lands for GRSG and their habitat to be considered as Areas of Critical Environmental Concern (ACECs). In response the BLM received ACEC nominations from a number of interested organizations. Section 103 of the Federal Land Policy and Management Act (FLPMA) defines ACECs as public lands for which special management attention is required (when such areas are developed or used or when no development is required) and 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. Section 202(c)(3) requires that priority be given to the designation and protection of ACECs in land use plans. Other factors set forth in FLPMA include consideration of the "relative scarcity of the values involved and the availability of alternative means and sites for realization of those values"; and the weighing of "long term benefits to the public against short-term benefits" (Sec. 202(c)).

Research Natural Areas (RNAs) are managed under the ACEC authority as areas with valuable ecological resources and representative cells for plant communities. These areas are protected and maintained in natural conditions, for the purposes of conserving biological diversity, conducting non-manipulative research and monitoring, and fostering education. The identification and establishment of a national network of RNAs was congressionally mandated for the US Forest Service in the National Forest Management Act (NFMA) (36 CFR Sec. 219.25; 36 CFR 251.23), and the BLM and National Park Service have been cooperators in this program for over 30 years. The Department of the Interior and the Department of Agriculture, Pacific Northwest Research Station

developed an Interagency Strategy for the Pacific Northwest Natural Areas Network in July 2009 (General Technical Report PNW-GTR-798).

The identification of potential ACECs and the designation of ACECs will be done though the planning process in accordance with the BLM's procedures for preparing, approving, and revising Resource Management Plans. FLPMA also states that ACEC identification "shall not, of itself, change or prevent change of management or use of public lands" (Sec. 201 (a)). Thus, there may be locations where an environmental resource has been identified as a potential ACEC that, nevertheless, will not be protected through ACEC designation. The designation and development of special management attention for a potential ACEC is a management decision done through the RMP process.

ACEC Nominations

During the scoping process for this RMPA/EIS the BLM received ACEC comments/potential ACEC nominations from Western Watersheds Project (WWP). In response, all GRSG PPH was identified as a huge ACEC, with the intent to protect all breeding, brooding, winter, and other critical sagebrush and occupied sage-grouse habitat. The boundaries of this citizen potential ACEC were developed by following the designated PPH boundaries on 4,547,043 acres. In addition, in response to citizen ACEC comments from WildEarth Guardians (WEG), the BLM identified 17 potential ACECs for Oregon following an interdisciplinary process on 4,041,905 acres. The ACEC boundaries were created by merging all active GRSG leks and occupied habitat, sage-grouse brooding, transitional and winter habitat, and high quality sagebrush habitat. Many potential ACECs included large blocks of sagebrush habitats in PPH and PGH at higher elevation (> 5,000 feet) with the intent that with vegetation changes because of climate change, many sagebrush habitats will be moving upslope through time and could serve as refugia for the birds in the future (i.e., future suitable habitat). Attention was paid to connectivity between the 17 ACECs and to existing ACECs and RNAs and isolated leks, with an attempt to provide for movement corridors. All ACECs were also designed to follow BLM ownership and livestock grazing allotment boundary or pasture fences, resulting in both PPH and PGH habitat being included. Using the abovementioned criteria, 17 ACECs were identified on 4,041,905 acres within the four districts.

ACEC Evaluation Process

Based on the two proposals from the public, the "all PPH ACEC", and the "17 ACEC" potential ACEC proposal, the areas were evaluated using an interdisciplinary process as identified in BLM Manual 1613 - Areas of Critical Environmental Concern, to decide if these areas should be carried forward for further evaluation in the land use planning process under various alternatives. The ACEC evaluations were conducted by a subgroup of the BLM's GRSG core team, which included federal and state wildlife biologists, a botanist, a range and fire ecologist, GIS support, and land use planners assigned to the project. Additional input was provided by specialists from each Field and District Office

as needed. The BLM core team evaluated the two external ACEC nominations, to determine relevance and importance. Sage-grouse habitat and existing vegetation information was evaluated for the areas. Draft GIS maps and attributes were created and reviewed and adjustments were made based on local understanding and knowledge of sage-grouse and habitat in the mapped areas.

RELEVANCE AND IMPORTANCE CRITERIA

As mentioned in the introduction, to be considered for designation as an ACEC, an area must meet the requirements of relevance and importance as described in the Code of Federal Regulations (43 CFR 1610.7.2). The definitions for relevance and importance are as follows:

Relevance

An area is considered relevant if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (for example, rare or sensitive archaeological resources and religious or cultural resources important to Native American Indians).
2. A fish and wildlife resource (for example, habitat for endangered, threatened, or sensitive species or habitat essential for maintaining species diversity).
3. A natural process or system (for example, endangered, threatened or sensitive plant species; rare, endemic, or relict plants or plant communities; and rare geologic features).
4. A natural hazard (for example, areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action could meet the relevance criteria if it is determined through the resource management planning process that it has become part of the natural process.

Importance

An area is considered important if the value, resource, system, process, or hazard described has substantial significance to satisfy the importance criteria, which generally means it is characterized by one or more of the following:

1. Has more than locally significant qualities that give it special worth, consequence, has meaning, distinctiveness, or cause for concern, especially compared with any similar resource.
2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to change.
3. Has been recognized as warranting protection to order to satisfy national priority concerns or to carry out the mandates of FLPMA.

Potential ACECs

A. For the "All PPH ACEC" proposal as nominated by WWP, the following meets the relevance test necessary for ACEC designation as:

1. Sage-grouse are a wildlife resource that are a candidate for Federal listing and are a BLM Special Status Species.
2. The proposed ACEC contains key natural processes and natural systems (high quality sagebrush plant communities), that are critical for the survival of sage-grouse, as identified as potential priority habitat (PPH).

The following "All PPH" potential ACEC also meets the Importance test necessary for ACEC designation as:

1. This ACEC has more than locally significant qualities that gives it special worth and cause for concern. These PPH areas have been identified as priority habitat for sage-grouse by the state and contain the higher-density lekking sites that are known in Oregon and that have been identified as key sage-grouse habitats. These areas link to PPH habitat in Nevada and Idaho, and include higher elevation habitats that the birds are likely to move into in the future as temperature regimes continue to increase and push big sagebrush plant communities and sage-grouse higher in elevation.
2. The proposed ACECs have qualities that make them unique and rare–areas of intact sagebrush plant communities supporting sage-grouse–that are vulnerable to change. Areas in southeast Oregon have been nationally recognized as having some of the higher sage-grouse densities and more high quality intact sagebrush habitat within the Great Basin.
3. The sage-grouse has also been recognized as needing protection at a multi-state, Great Basin scale and is a national priority. These ACECs that are made up of all PPH contain the best of the habitats as designated by the state.

B. For the proposal in response to citizen comments from WEG, 17 potential ACECs were developed by the ACEC Sub Group. For the 17 potential ACECs, the following meet the relevance test necessary for ACEC designation as:

1. Sage-grouse are a wildlife resource that are a candidate for Federal listing and are a BLM Special Status Species.
2. The potential ACECs also contain key natural processes and natural systems (high quality sagebrush plant communities) that are critical for sage-grouse.

The following "17 ACEC" proposal also meets the Importance test necessary for ACEC designation as:

1. These ACECs have more than locally significant qualities that give them special worth and cause for concern. These proposed areas contain the higher-density lekking sites that are known in Oregon and that are some of the highest densities in the Great Basin. These areas serve as refugia for the bird, are spatially arrayed to connect to existing ACECs and RNAs and to other potential ACECs and priority and key sage-grouse habitats in Nevada and Idaho. They also include habitats that the birds are likely to move into in the future as temperature regimes continue to increase and push big sagebrush and sage-grouse higher in elevation.
2. The potential ACECs have qualities that make them unique and rare–areas of relatively intact sagebrush plant communities supporting sage-grouse–that are vulnerable to change. Areas in southeast Oregon have been nationally recognized as having some of the higher sage-grouse densities and more high quality intact sagebrush habitat within the Great Basin.
3. The sage-grouse has also been recognized as needing protection at a multi-state, Great Basin scale and is a national priority. These potential ACECs contain the some of the best of the 'Core' habitats as designated by the state.

The following areas were identified as potential ACECs under the "17 ACEC" proposal.

#1 Diablo Peak - Acres: 345,250
Values: Core sage-grouse leks, nesting and brooding habitat, connectivity between proposed East Warner ACEC and existing ACECs in PPH, contains suitable habitat at higher elevation.

#2 East Warner – Acres: 313,182
Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat, connectivity between proposed Diablo peak and proposed ACECs in Nevada, existing ACECs and RNAs in PPH, contains suitable habitat at higher elevation.

#3 Hill - Acres: 74,778
Values: Core sage-grouse leks, nesting and brooding habitat, connectivity with proposed ACECs in Nevada and between existing ACECs and Hart Mountain. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#4 Beaty Butte - Acres: 507,050
Values: Core sage-grouse leks, nesting, brooding, and wintering habitat; connectivity with USFWS Sheldon Refuge and Hart Mountain. The ACEC

contains suitable sage-grouse habitat at the higher elevations. Contains important habitat for other wildlife (pronghorn antelope).

#5 Jackass - Acres: 428,057

Values: Core sage-grouse leks, nesting, brooding and wintering habitat; connectivity to the south with Hart Mountain. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#6 Lone Mountain - Acres: 244,797

Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat; connectivity to the south with Hart Mountain and existing ACECs. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#7 Trout Creek - Acres: 675,218

Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat; connectivity to proposed ACECs in Nevada, and across southeastern Oregon east to west, and existing ACECs and RNAs. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#8 Corner – Acres: 355,598

Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat; connectivity with key sage grouse habitat in Idaho and proposed ACECs in Nevada, existing ACECs and RNAs, and habitat in the Fort McDermitt Shoshone Paiute Indian Reservation. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#9 Antelope – Acres: 117,076

Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat; connectivity with key sage grouse habitat in Idaho and to proposed ACECs to the north and south. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#10 Cow Creek – Acres: 42,776

Values: Core sage-grouse leks, nesting, brooding and wintering habitat; connectivity with key sage grouse habitat in Idaho and to proposed ACECs to the north and south. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#11 Star Mountain – Acres: 102,858

Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat; connectivity with Red Hills and Cow Creek. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#12 Red Hills – Acres: 83,849

Values: High density of sage-grouse leks in core, nesting, brooding and wintering habitat; connectivity with Star Mountain and Cow Creek. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#13 Willow – Acres: 53,803

Values: Core sage-grouse leks, nesting and brooding habitat; connectivity to virtue flat and red hills and existing ACEC and RNA. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#14 Virtue Flat – Acres: 21,938

Values: High density of sage-grouse leks in core, nesting, brooding habitat; ongoing long term research sites, northern most populations, connectivity across Snake River with key habitats in Idaho.

#15 Goose – Acres: 4,785

Values: Sage-grouse leks in core, nesting, and brooding habitat; connectivity with adjacent proposed ACECs.

#16 Buck Creek – Acres: 143,151

Values: High density of sage-grouse leks in isolated core habitat, nesting, brooding and wintering habitat; connectivity with Frederick Butte. The ACEC contains suitable sage-grouse habitat at the higher elevations.

#17 Frederick Butte – Acres: 527,739

Values: High density of sage-grouse leks in isolated core habitat, nesting, brooding and wintering habitat; connectivity with Buck Creek. The most northwest population of sage-grouse in Oregon. The ACEC contains suitable sage-grouse habitat at the higher elevations.

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Appendix K

Special Status Species

APPENDIX K
SPECIAL STATUS SPECIES

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
American pillwort	*Pilularia americana*	BLM S	Shallow vernal pools	X			
Annual dropseed	*Muhlenbergia minutissima*	BLM S	Sandy and gravelly drainages, rocky slopes, flats, road cuts, and open sites; usually found in ponderosa pine and oak-pine forests, juniper woodlands, thorn-scrub forests, and grasslands; 1,200 to 3,000 meters				X
Arrowleaf thelypody	*Thelypodium eucosmum*	BLM S	Moist seepy areas on ashy-clay soils in juniper/shrublands	X			
Awned sedge	*Carex atherodes*	BLM STR	Wet meadows, seeps, pond edges; less than 1,400 meters		X	X	

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Barren Valley collomia	*Collomia renacta*	BLM S	Relatively undisturbed rocky sites with poorly developed soils on scablands or lithic soils in grey rabbitbrush and sandberg bluegrass communities.				X
Bartonberry	*Rubus bartonianus*	BLM S	Rocky riparian zones along tributaries of the Snake River and on steep, talus and scree slopes in side canyons; 1,100 to 4,600 feet				X
Bastard milkvetch	*Astragalus tegetarioides*	BLM S	Primarily in cracks of welder tuffaceous rock outcrops or sandy soils, in dry pine forests and sagebrush communities; 1,350 to 1,650 meters			X	
Beautiful penstemon	*Penstemon perpulcher*	BLM STR	Western juniper – big sagebrush, bluebunch wheatgrass and Idaho fescue grasslands; less than 1,500 meters				X
Bellard's kobresia	*Kobresia myosuroides*	BLM S	Moist meadows and wetlands		X		
Biennial stanleya	*Stanleya confertifolia*	BLM S	Barren clay slopes in sagebrush communities, heavy clay flats, loose soil mounds, dry sandy grounds, alkaline meadows and flats; 600 to 1,500 meters				X
Bogg's lake hedge-hyssop	*Gratiola heterosepala*	BLM S	Shallow water, mud or damp soil at edges of lakes and vernal pools			X	
Bolander's spikerush	*Eleocharis bolanderi*	BLM S	Fresh, often summer-dry meadows, springs, seeps stream margins; 1,000 to 3,400 meters			X	X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Broad fleabane	*Erigeron latus*	BLM S	Dry, open places, level to moderate slope, commonly with sagebrush, usually undisturbed, sometimes grazed or burned sites; 200 to 400 meters				X
Broad-keeled milk-vetch	*Astragalus platytropis*	BLM S	Stony crests, screes, talus, gravely hilltops and barren ridges in sagebrush communities on strongly calciphile soils; 1,650 to 3,530 meters				X
Broad-toothed monkeyflower	*Mimulus latidens*	BLM S	Vernally wet depressions, drainages; less than 1,700 meters			X	
Bupleurum	*Bupleurum americanum*	BLM S	Rocky outcrops in forest openings or in open grasslands or dry meadows				X
Capitate sedge	*Carex capitata*	BLM S	Wet or seasonally wet meadows		X		
Chambers' twinpod	*Physaria chambersii*	BLM S	Clay hillsides, limestone gravel, dolomite ridges, road edges, loose gravel, reddish clay, sagebrush, and juniper areas; 1,500 to 3,200 meters				X
Chromato - chlamys lichen	*Thelenella muscorum* var. *octospora*	BLM STR	Soil crusts in big sagebrush steppe and bluebunch wheatgrass and Idaho fescue grasslands; less than 1,200 meters	X			
Colonial luina	*Luina serpentina*	BLM S	Serpentine outcrops	X			
Columbia cress	*Rorippa columbiae*	BLM S	Vernally wet meadows and lake playas with mostly clay soils			X	
Cooper's goldflower	*Hymenoxys lemmonii*	BLM S	Roadsides, open areas, meadows, on slopes, along drainages, and streams; 1,400 to 2,200 meters			X	X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Cordilleran sedge	*Carex cordillerana*	BLM S	Rocky slopes with sagebrush and juniper		X		X
Crater Lake grapefern	*Botrychium pumicola*	BLM S	Pumice soils with lodgepole pine; 1,500 to 2,500 meters	X			
Crenulate moonwort	*Botrychium crenulatum*	BLM S	Moist meadows, streambanks, shrub dominated wetlands, continuous springs, wet roadside areas; 1,500 to 2,500 meters			X	
Cronquist's stickseed	*Hackelia cronquistii*	BLM S	Big sagebrush – antelope bitterbrush / bluebunch wheatgrass – Idaho fescue communities; slopes, typically north facing; 600 to 750 meters				X
Crosby's buckwheat	*Eriogonum crosbyae*	BLM S	Grows on slopes comprised of light-tan to white volcanic ash deposits, sandstone, or altered tuffaceous material stratified with rhyolite in sparse sagebrush/rabbitbrush communities; 1,500 to 1,800 meters			X	
Cusick's buckwheat	*Eriogonum cusickii*	BLM S	Prefers barren, rocky areas with dry gravelly volcanic soil in open flats in sagebrush communities, or very exposed areas along subalpine ridges; 1,450 to 3,000 meters			X	
Cusick's giant-hyssop	*Agastache cusickii*	BLM S	In rocky places on margins of playas and dry stream beds, and on talus slopes, at mid to high elevations			X	
Cusick's lupine	*Lupinus lepidis* var. *cusickii*	BLM S	Wyoming big sagebrush – Idaho fescue grasslands; 800 to 1,100 meters				X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Dark alpine sedge	*Carex subnigricans*	BLM S	Moist rocky slopes and meadows; Steens Mountains		X		
Darkthroat shootingstar	*Dodecatheon pulchellum* var. *shoshonense*	BLM S	Moist, alkali, inland, meadow communities; 700 to 2,400 meters				X
Davidson's rockcress	*Arabis davidsonii*	BLM STR	Rock outcrops; 1,500 to 3,500 meters				X
Davis' peppergrass	*Lepidium davisii*	BLM S	Clay playas in sagebrush communities, vernal ponds; 800 to 1,600 meters				X
Desert allocarya	*Plagiobothrys salsus*	BLM S	Alkaline playas, sinks at low elevations			X	
Desert chaenactis	*Chaenactis xantiana*	BLM S	Open, deep loose, sandy (rarely gravelly) soils, arid and semiarid shrublands, chaparral; 300 to 2,500 meters			X	X
Desert needlegrass	*Achnatherum speciosum*	BLM S	Dry sagebrush communities; 600 to 1,500 meters		X		
Desert prenanthella	*Prenanthella exigua*	BLM S	Sandy, gravelly, or clay soils; desert sashes and open slopes to sagebrush-juniper steppes; 20 to 1,900 meters				X
Disappearing monkeyflower	*Mimulus evanescens*	BLM S	Vernally wet gravelly, rocky areas, and low, wet fields, in sagebrush-juniper zones; 1,200 to 1,700 meters			X	X
Dwarf suncup	*Camissonia pygmaea*	BLM S	Dry, gravelly washes	X			
Etter's senecio	*Senecio ertterae*	BLM S	Talus slopes on greenish yellow ash tuff; 900 to 1,200 meters				X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Flathead larkspur	*Delphinium bicolor*	BLM S	Grasslands, sagebrush steppe, ponderosa pine forests, and subalpine screes				X
Fringed desert-parsley	*Lomatium feonicaulaceum* ssp. *fimbriatum*	BLM S	Dry open slopes, from valleys and plains to middle or sometimes high elevation in mountains				X
Geyer's milk-vetch	*Astragalus geyeri* var. *geyeri*	BLM S	Depressions in mobile or stabilized dunes, sandy flats, and valley floors, along draws in gullied hills, and on margins of alkaline sandy playas; below 1,850 to 2,150 meters				X
Geyer's onion	*Allium geyeri* var.*geyeri*	BLM S	Moist open slopes, meadows, or stream banks; 200 to 4,000 meters			X	
Golden buckwheat	*Eriogonum chrysops*	BLM S	Gravelly basaltic or rhyolitic slopes and outcrops, in low sagebrush – sandberg bluegrass communities; 1,200 to 1,400 meters				X
Greeley's cymopterus	*Cymopterus acaulis* var. *greeleyorum*	BLM S	Heavy clay, sand, or volcanic ash. Sandy soil and brown and white volcanic ash in Wyoming sagebrush, desert shrub and Indian ricegrass zones				X
Greenbanded mariposa lily (sagebrush mariposa)	*Calochortus macrocarpus* var. *macrocarpus*	BLM S	Grasslands in sagebrush steppe; often found on basalt substrates on hillside grasslands and rock outcrops with ponderosa pine, balsamroot , bluebunch wheatgrass, Idaho fescue and Sandberg's bluegrass; 300 to 1,370 meters				X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Green buckwheat	*Eriogonum umbellatum* var. *glaberrimum*	BLM S	Sandy to gravelly slopes in big sagebrush communities			X	
Greentinge Indian paintbrush	*Castilleja chlorotica*	BLM S	Mid-elevation open forest to subalpine slopes, associated with Juniper/big sagebrush, ponderosa/bitterbrush, and mountain mahogany stands	X			
Grimy ivesia	*Ivesia rhypara* var. *rhypara*	BLM S	Soils ranging from reddish tuff to loose light-colored volcanic ash, shallow on gravelly, light-colored soil derived from vitric ash flow pumice with antelope bitterbrush; 1,300 to 1,600 meters			X	X
Hairlike sedge	*Carex capillaris*	BLM S	In moss mats in moist areas, bogs, marshes, streambanks, wet meadows, sometimes on limestone substrates		X		
Henderson's ricegrass	*Achnatherum hendersonii*	BLM S	Rocky ridgeline grasslands in big sagebrush	X			
Hooker's wild buckwheat	*Eriogonum hookeri*	BLM S	Sandy washes, flats, and slopes, saltbush, greasewood, sagebrush, and mountain mahogany communities, juniper woodlands; 1,300 to 2,500 meters				X
Ibapah wavewing	*Cymopterus ibapensis*	BLM S	Open places, variously in sandy, gravelly, rocky, loam, or clay soil, often with sagebrush or juniper; 1,350 to 2,700 meters				X
Iodine bush	*Allenrolfea occidentalis*	BLM S	Alkaline playas and clay flats, wetland pools		X		X

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Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
King's rattleweed	*Astragalus calycosus*	BL' S	Dry stony or otherwise barren places, from the valley floor to lower foothills in sagebrush or juniper-pinyon forest, strongly but not obligatory calciphine soils; 1,300 to 3,950 meters				X
Lahontan sagebrush	*Artemisia arbuscula* ssp. *longicaulis*	BLM S	Dry plains and hills, commonly in shallower soil or less favorable sites than *A. tridentata*; lowlands to 3,300 meters				X
Leiberg's clover	*Trifolium leibergii*	BLM S	Barren tuffaceous hillsides, bare shaley crests and talus, reddish ash-flow; 1,200 to 2,400 meters			X	X
Lesser panicle sedge	*Carex diandra*	BLM S	Bogs and fens, lakeshores, springs and seeps			X	
Longbeard mariposa lily	*Calochortus longebarbatus* var. *peckii*	BLM S	Vernally moist draws, streambeds, meadow basins	X			
Long-flowered snowberry	*Symphoricarpos longiflorus*	BLM S	Open, rocky slopes and washes in the sagebrush and juniper zones, sometimes extending upwards into the ponderosa pine zone; up to 2,200 meters			X	X
Lyrate malacothrix	*Malacothrix sonchoides*	BLM S	Usually on dunes or in deep, fine sand in arroyos and on plains in Joshua tree woodlands, grasslands; 300 to 2,100 meters			X	X
Mackenzie's phacelia	*Phacelia lutea* var. *mackenzieorum*	BLM S	Un-weathered tuff talus				X
Malheur stylocline	*Stylocline psilocarphooides*	BLM STR	Sandy – gravelly soils in sagebrush; less than 1,800 meters				X

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Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Malheur Valley fiddleneck	*Amsinckia carinata*	BLM S	Sandy loam soils and yellow ash tuff on north facing slopes; 1,100 meters				X
Malheur wirelettuce	*Stephanomeria malheurensis*	FE	Known only from the top of a dry, broad hill on volcanic soil intermixed with layers of limestone in sagebrush		X		
Moonwort	*Botrichium lunaria*	BLM S	Damp turf and gravel, hillside seeps, carex meadow		X		
Moss gentian	*Gentiana prostrata*	BLM S	Sub-alpine wet meadows, moss mats, seeps, springs; 2,600 meters		X		
Mucronleaf tortula moss	*Tortula mucronifolia*		On soil, tree roots, and sheltered ledges and crevices of rock outcrops and cliffs in riparian forest composed of western birch, quaking aspen, and black cottonwood		X		
Mulford's milk-vetch	*Astragalus mulfordiae*	BLM S	Sandy bluffs and dune like or sometimes shaley talus of river-terraces; 650 to 950 meters				X
Native sedge	*Carex vernacular*	BLM S	Subalpine wet meadows, rocky slopes, stream edges and lakeshores		X		
Nevada lupine	*Lupinus nevadensis*	BLM S	Hillsides and valley floors, in dry sandy or gravelly soils among sagebrush			X	
Duskyseed sedge	*Carex pelocarpa*	BLM S	Subalpine to alpine slopes, ridges, boulder fields, talus and rocky streamsides		X		
Obscure buttercup	*Ranunculus triternatus*	BLM S	Vernally moist grasslands, cliff faces	X			

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Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Ochoco desert parsley	*Lomatium ochocense*	BLM S	Rocky ridegelines and grasslands with big sagebrush and stiff sagebrush; 1,300 to 1,450 meters	X			
Oregon semaphore grass	*Pleuropogon oregonus*	BLM S	Wet meadows and streambanks, where water flows year around			X	
Orthotrichum moss	*Orthotrichum euryphyllum*	BLM STR	Basalt rock outcrops and outcrops at seeps and springs, in big sagebrush, ponderosa pine, and juniper woodlands		X		
Owyhee clover	*Trifolium owyheense*	BLM S	Steep barren slopes, ridges, and playa-margins, in Wyoming big sagebrush on shallow blue-gray diatomaceous or yellow green tuff soils; 1,300 to 1,500 meters				X
Owyhee sagebrush	*Artemisia papposa*	BLM S	Rocky swales, dry meadows, alkaline mud flats; 1,400 to 2,100 meters				X
Packard's desert-parsley	*Lomatium packardiae*	BLM STR	Dry, open, rocky soils of rhyolite or volcanic ash in sagebrush; 1,200 to 2,300 meters				X
Packard's mentzelia	*Mentzelia packardiae*	BLM STR	Talus slopes, volcanic ash soils, in big sagebrush communities; 800 to 1600 meters				X
Palmer's evening-primrose	*Camissonia palmeri*	BLM STR	Dry, open sagebrush scrub; less than 1,200 meters				X
Peck's milkvetch	*Astragalus peckii*	BLM S	Loose pumice/ash soils in open lodgepole pine and juniper forests with big sagebrush – bitterbrush flats; 800 to 1,100 meters	X			

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Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Playa buckwheat	*Eriogonum salicornioides*	BLM S	Clayey flats and slopes, saltbush, greasewood and sagebrush communities, juniper woodlands; 700 to 1,300 meters				X
Playa yellow phacelia	*Phacelia inundata*	BLM S	Mostly on alkali flats and on or around the margins of playas, sinks, and fluctuating lakes, in places that are likely to be submerged for part of the year, only seldom on slopes			X	X
Prickly poppy	*Argemone munita*	BLM S	Sandy loam in big sagebrush and greasewood		X		X
Profuse-flowered pogogyne	*Pogogyne floribunda*	BLM S	Restricted to summer-dry playa lake beds and ephemeral channels in Great Basin silver sagebrush communities			X	X
Prostrate buckwheat	*Eriogonum prociduum*	BLM S	Barren, dry volcanic gravelly slopes in sagebrush communities; 1,400 to 2,400 meters			X	X
Purple cymopterus	*Cympoterus purpurascens*	BLM S	Dry rocky, big sagebrush communities, desert scrub, ash soils; 1,400 meters		X		
Rafinesque's pondweed	*Potamogeton diversifolius*	BLM S	Shallow lakes, ponds and pools		X		
Rock olive	*Peltula euploca*	BLM STR	Basalt rock outcrops in juniper woodlands and sagebrush			X	
Rough pyrrocoma	*Pyrrocoma scaberula*	BLM S	Snake river canyon grasslands				X
Rose's desert parsley	*Lomatium roseanum*	BLM S	Rock soils and crevices in big sagebrush / sandberg blue grass and rabbitbrush communities				X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Rosy pussypaws	*Cistanthe rosea*	BLM S	Gravelly soils; 1,500 to 3,800 meters				X
Rural paintbrush	*Castilleja flava* var. *rustica*	BLM S	Open big sagebrush – bunchgrass, open pine forests				X
Seaside heliotrope	*Heliotropium curassavicum* var. *obovatum*	BLM S	Saline places, on or around the margins of alkaline lakes and playas in mid-elevation valleys		X	X	X
Shelly's ivesia	*Ivesia rhypara* var. *shellyi*	BLM S	Pockets in boulders and outcrops of pumiceous welded ash-flow tuff along walls of canyons in bunchgrass-sagebrush hills			X	
Shockley's ivesia	*Ivesia shockleyi*	BLM S	Andesite rocky outcrops in low sagebrush, sandberg blue grass / Idaho fescue communities				X
Short-flowered eriogonum	*Eriogonum brachyanthum*	BLM S	Sandy soils, dunes with greasewood and saltbush		X		
Short-seeded waterwort	*Elatine brachysperma*	BLM S	Mud or shallow water on the banks of streams and at the edges of ponds and reservoirs; 1,200 to 1,500 meters			X	X
Slender gentian	*Gentianella tenella* ssp. *tenella*	BLM S	Wet meadows at high elevation		X		
Slender sedge	*Carex lasiocarpa* var. *americana*	BLM S	Fens, bogs, lakeshores, wet meadows, floating mats in deep soils with moderate nutrient levels.			X	
Slender wild cabbage	*Caulanthus major* var. *nevadensis*	BLM S	Margin of montane forests, sagebrush, juniper woodlands; 1,500 to 3,200 meters				X
Smooth mentzelia	*Mentzelia mollis*	BLM S	Barren heavy clay slopes and bluffs derived from volcanic ash; 800 to 1,465 meters				X

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Smooth wild cabbage	*Caulanthus crassicaulis* var. *glaber*	BLM S	Sagebrush scrub, juniper woodland; 1,200 to 2,900 meters				X
Snake River goldenweed	*Pyrrocoma radiata*	BLM S	Dry hillsides, alkaline slopes in big sagebrush / bluebunch wheatgrass communities; 600 to 2,400 meters				X
Snowline cymopterus	*Cymopterus nivalis*	BLM S	Ash flow soils or open rocky places in juniper/sagebrush/bunchgrass communities with varying slopes and elevations, often associated with *Eriogonum prociduum, E. cusickii*			X	
Soleri's pygmy-weed	*Crassula solierii*	BLM STR	Mudflats, vernal pools, wetland edges; less than 2,000 meters		X		X
South fork John Day milkvetch	*Astragalus diaphanus var. diurnus*	BLM STR	Dry, barren, gravelly slopes in juniper woodlands and sagebrush; 760 to 1,100 meters	X			
Spalding's catchfly	*Silene spaldingii*	FT	Grasslands with Idaho fescue, bluebunch wheatgrass, snowberry or sagebrush; 470 to 1,160 meters				X
Spiny fameflower	*Phemeranthus spinescens*	BLM S	Basalt outcrops in sagebrush steppe	X			
St. Jacob's wovenspore lichen	*Texosporium sancti-jacobi*	BLM S	Grasslands in big sagebrush communities	X			
Sterile milk-vetch	*Astragalus cusickii* var. *sterilis*	BLM S	Rocky hillsides, bluffs, talus-slopes, and barren hilltops; below 1,500 meters				X
Suksdorf's desertparsley	*Lomatium suksdorfii*	BLM S	Open gravelly, rocky slopes in grasslands and woodlands	X			

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Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Three-color monkeyflower	*Mimulus tricolor*	BLM S	Vernally wet depressions, wet clay soil, especially desiccated vernal pools			X	
Three forks stickseed	*Hackelia ophiobia*	BLM S	Talus and rock-crevices. Talus at the base of rhyolitic cliffs and rock crevices on shady north face of canyons				X
Tioga pass sedge	*Carex tiogana*	BLM S	In moss mats in moist areas, bogs, marshes, streambanks, wet meadows, sometimes on limestone substrates, (Steen's Mountains, see *Carex capillaris*)		X		
Transmontane abronia	*Abronia turbinata*	BLM S	Sandy soils, desert scrub; 900 to 2,500 meters				X
Tygh Valley milkvetch	*Astragalus tyghensis*	BLM S	Open juniper and pine woodlands; dry, rocky, clay soils; canyon walls; big sagebrush grasslands; 400 to 550 meters	X			
United blazingstar	*Mentzelia congesta*	BLM S	Open dry places, often in sandy soils, usually where the sand shifts and in sites disturbed by humans; 1,200 to 2,550 meters				X
Variable hot-rock penstemon	*Penstemon deustus var. variabilis*	BLM STR	Dry foothills and grasslands on thin soils; 500 to 800 meters	X			
Verrucose sea-purslane	*Sesuvium verrucosum*	BLM S	Saline or alkaline soil on or around margins of interior seasonal lakes, often with *Heliotropium curassavicum* var. *obovatum* and black greasewood			X	

Table K-1
Special Status Plant Species

Common Name	Scientific Name	Status[1]	General Habitat	Prineville District	Burns District	Lakeview District	Vale District
Warner Mt. bedstraw	*Galium serpenticum* var. *warnerense*	BLM S	Steep slopes, rocky scree areas and talus slopes, at bases or rock outcrops, along road cuts; 1,450 to 2,750 meters			X	
Watson's desertparsley	*Lomatium watsonii*	BLM S	Dry open, rocky slopes in sagebrush, grasslands	X			
Wedge-leaf saxifrage	*Saxifraga adscendens* spp. *oregonensis*	BLM S	Moist meadows, rocky slopes at high elevation		X		
Wheeler's skeleton-weed	*Chaetadelpha wheeleri*	BLM S	Dunes, sandy soils and alkali flats in creosote bush scrub; 800 to 1,800 meters				X
White locoweed	*Oxytropis sericea* var. *sericea*	BLM S	Prairies, plains, foot-hills, especially in open dry grasses and rocky habitats below 2,200 meters; bur ascending to mountain balds and through open pine forest to timberline near 3,300 meters				X
Whitebark pine	*Pinus albicaulis*	BLM S	High elevation – subalpine forests				X

Sources: BLM species files; Oregon Plant Atlas 2012; ORBIC 2012; Flora of North America 2013; Intermountain Flora
[1] FE – Federally endangered, FT – Federally threatened, BLM S – BLM Sensitive, BLM STR – BLM Strategic

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Appendix L

Special Status Species

APPENDIX L
SPECIAL STATUS SPECIES

Table L-1 lists the special status species documented (D) as occurring or suspected (S) to occur on BLM-administered lands within the planning area. Status codes are S = BLM Sensitive, FT = Federally Threatened, and FE = Federally Endangered.

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
BIRD						
AGELAIUS TRICOLOR	TRICOLORED BLACKBIRD	S		D	D	
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW	S	D		D	D
ANSER ALBIFRONS ELGASI	TULE WHITE-FRONTED GOOSE	S		S		
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER	S			S	
BUCEPHALA ALBEOLA	BUFFLEHEAD	S			D	
CENTROCERCUS UROPHASIANUS	GREATER SAGE-GROUSE	S	D	D	D	D
CHARADRIUS ALEXANDRINUS NIVOSUS	WESTERN SNOWY PLOVER	S	D	D		
COCCYZUS AMERICANUS	YELLOW-BILLED CUCKOO	S	D	S	S	D
COTURNICOPS NOVEBORACENSIS	YELLOW RAIL	S		D	D	

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
CYGNUS BUCCINATOR	TRUMPETER SWAN	S	D	S	D	D
CYPSELOIDES NIGER	BLACK SWIFT	S			S	
DOLICHONYX ORYZIVORUS	BOBOLINK	S	D		S	D
EGRETTA THULA	SNOWY EGRET	S	D	D		
EREMOPHILA ALPESTRIS STRIGATA	STREAKED HORNED LARK	S				D
FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	S	D	D	D	D
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	S	D	D	D	D
LARUS PIPIXCAN	FRANKLIN'S GULL	S	D	D		D
LEUCOSTICTE ATRATA	BLACK ROSY FINCH	S	D			
LEUCOSTICTE TEPHROCOTIS WALLOWA	WALLOWA ROSY FINCH	S				S
MELANERPES LEWIS	LEWIS' WOODPECKER	S	S		D	D
PELECANUS ERYTHRORHYNCHOS	AMERICAN WHITE PELICAN	S	D	D		D
PICOIDES ALBOLARVATUS	WHITE-HEADED WOODPECKER	S	D	D	D	D
PODICEPS AURITUS	HORNED GREBE	S	D	D		D
PODICEPS GRISEGENA	RED-NECKED GREBE	S		S		
PROGNE SUBIS	PURPLE MARTIN	S				D
SEIURUS NOVEBORACENSIS	NORTHERN WATERTHRUSH	S			S	
TYMPANUCHUS PHASIANELLUS COLUMBIANUS	COLUMBIAN SHARP-TAILED GROUSE	S				S
FISH						
ONCORHYNCHUS MYKISS	STEELHEAD	FT			D	D
ONCORHYNCHUS MYKISS (SNAKE RIVER BASIN)	STEELHEAD	FT				D
ONCORHYNCHUS TSHAWYTSCHA	CHINOOK SALMON	FT				D

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
ONCORHYNCHUS TSHAWYTSCHA (SNAKE RIVER FALL RUNS)	CHINOOK SALMON	FT				D
CATOSTOMUS MICROPS	MODOC SUCKER	FE		S		
CATOSTOMUS TAHOENSIS	TAHOE SUCKER	S				D
CATOSTOMUS WARNERENSIS	WARNER SUCKER	FT		D		
COTTUS PITENSIS	PIT SCULPIN	S		S		
GILA ALVORDENSIS	ALVORD CHUB	S	D			
GILA BICOLOR EURYSOMA	SHELDON TUI CHUB	S		D		
GILA BICOLOR OREGONENSIS	OREGON LAKES TUI CHUB	S		D		
GILA BICOLOR SSP.	CATLOW TUI CHUB	S	D			
GILA BICOLOR SSP.	HUTTON TUI CHUB	FT		D		
GILA BICOLOR SSP.	SUMMER BASIN TUI CHUB	S		D		
GILA BICOLOR THALASSINA	GOOSE LAKE TUI CHUB	S		S		
GILA BORAXOBIUS	BORAX LAKE CHUB	FE	D			
LAMPETRA TRIDENTATA	GOOSE LAKE LAMPREY	S		D		
LAVINIA SYMMETRICUS MITRULUS	PIT ROACH	S		S		
ONCORHYNCHUS CLARKII HENSHAWI	LAHONTAN CUTTHROAT TROUT	FT	D			D
ONCORHYNCHUS CLARKII LEWISI	WESTSLOPE CUTTHROAT TROUT	S			D	
ONCORHYNCHUS MYKISS	REDBAND TROUT	S	D	D		D
ONCORHYNCHUS MYKISS (MALHEUR LAKES)	REDBAND TROUT	S	D			
ONCORHYNCHUS MYKISS (OREGON GREAT BASIN)	REDBAND TROUT	S	D	D		D
ONCORHYNCHUS MYKISS (WARNER VALLEY/WARNER LAKES)	REDBAND TROUT	S		D		

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
RHINICHTHYS OSCULUS	FOSKETT SPECKLED DACE	FT		D		
RICHARDSONIUS EGREGIUS	LAHONTAN REDSIDE SHINER	S				D
SALVELINUS CONFLUENTUS	BULL TROUT	FT	D		D	D
AMPHIBIAN						
ANAXYRUS WOODHOUSII	WOODHOUSE'S TOAD	S				D
ASCAPHUS MONTANUS	ROCKY MOUNTAIN TAILED FROG	S				D
DICAMPTODON COPEI	COPE'S GIANT SALAMANDER	S			D	
LITHOBATES PIPIENS	NORTHERN LEOPARD FROG	S		S		D
RANA LUTEIVENTRIS	COLUMBIA SPOTTED FROG	S	D	D	D	D
RANA LUTEIVENTRIS (OUTSIDE GREAT BASIN)	COLUMBIA SPOTTED FROG	S			D	
RANA PRETIOSA	OREGON SPOTTED FROG	S		S	D	
REPTILES						
ACTINEMYS MARMORATA	PACIFIC POND TURTLE	S		D		
CHRYSEMYS PICTA	PAINTED TURTLE	S				D
MAMMALS						
ANTROZOUS PALLIDUS	PALLID BAT	S	D	D	D	D
BRACHYLAGUS IDAHOENSIS	PYGMY RABBIT	S	D	D	D	D
CANIS LUPUS	GRAY WOLF	FE				D
CANIS LUPUS (NORTHERN ROCKY MTN.)	GRAY WOLF	S				D
CORYNORHINUS TOWNSENDII	TOWNSEND'S BIG-EARED BAT	S	D	D	D	D
EUDERMA MACULATUM	SPOTTED BAT	S	D	S	D	D
GULO GULO LUSCUS	NORTH AMERICAN WOLVERINE	S	D		S	S
LYNX CANADENSIS	CANADA LYNX	FT	D		S	S

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
MYOTIS THYSANODES	FRINGED MYOTIS	S	D	D	D	D
SPERMOPHILUS WASHINGTONI	WASHINGTON GROUND SQUIRREL	S			D	D
VULPES MACROTIS	KIT FOX	S	D	D		D
FUNGUS						
RHIZOPOGON BRUNNEIFIBRILLOSUS	FUNGUS	S			S	
NON-VASCULAR PLANT						
ANTHELIA JULACEA	LIVERWORT	S	S			S
BARBILOPHOZIA LYCOPODIOIDES	LIVERWORT	S				S
JUNGERMANNIA POLARIS	LIVERWORT	S	S			S
LOPHOZIA GILLMANII	LIVERWORT	S	S			S
PELTOLEPIS QUADRATA	LIVERWORT	S				S
PREISSIA QUADRATA	LIVERWORT	S	S		S	S
PTILIDIUM PULCHERRIMUM	LIVERWORT	S				S
SCHISTIDIUM CINCLIDODONTEUM	MOSS	S	S			S
TORTULA MUCRONIFOLIA	MOSS	S	D	S	S	
TEXOSPORIUM SANCTI-JACOBI	LICHEN	S	S	S	D	S
VASCULAR PLANT						
ABRONIA TURBINATA	TRANS MONTANE ABRONIA	S	D			D
ACHNATHERUM HENDERSONII	HENDERSON'S RICEGRASS	S			D	
ACHNATHERUM SPECIOSUM	DESERT NEEDLEGRASS	S	D			S
ACHNATHERUM WALLOWAENSIS	WALLOWA RICEGRASS	S			S	S
AGASTACHE CUSICKII	CUSICK'S GIANT-HYSSOP	S	D	D		D
ALLENROLFEA OCCIDENTALIS	IODINE BUSH	S	D			D
ALLIUM GEYERI VAR. GEYERI	GEYER'S ONION	S		D		S

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
AMSINCKIA CARINATA	MALHEUR VALLEY FIDDLENECK	S				D
ARABIS SPARSIFLORA VAR. ATRORUBENS	SICKLE-POD ROCKCRESS	S			S	
ARGEMONE MUNITA	PRICKLY-POPPY	S	D			D
ARTEMISIA ARBUSCULA SSP. LONGICAULIS	LAHONTAN SAGEBRUSH	S	S		S	D
ARTEMISIA PAPPOSA	OWYHEE SAGEBRUSH	S				D
ASPLENIUM TRICHOMANES-RAMOSUM	GREEN SPLEENWORT	S				S
ASTRAGALUS CALYCOSUS	KING'S RATTLEWEED	S				D
ASTRAGALUS CUSICKII VAR. STERILIS	STERILE MILK-VETCH	S	S			D
ASTRAGALUS GEYERI VAR. GEYERI	GEYER'S MILK-VETCH	S		S		D
ASTRAGALUS LEMMONII	LEMMON'S MILK	S			S	
ASTRAGALUS MULFORDIAE	MULFORD'S MILK-VETCH	S				D
ASTRAGALUS PECKII	PECK'S MILK-VETCH	S			D	
ASTRAGALUS PLATYTROPIS	BROAD-KEELED MILK-VETCH	S	S			D
ASTRAGALUS TEGETARIOIDES	BASTARD KENTROPHYTA	S	D	D	S	
ASTRAGALUS TYGHENSIS	TYGH VALLEY MILK-VETCH	S			D	
BOTRYCHIUM ASCENDENS	UPWARD-LOBED MOONWORT	S			S	S
BOTRYCHIUM CAMPESTRE	PRAIRIE MOONWORT	S				S
BOTRYCHIUM CRENULATUM	CRENULATE MOONWORT	S	D	D	S	S
BOTRYCHIUM HESPERIUM	WESTERN MOONWORT	S				S
BOTRYCHIUM LINEARE	SLENDER MOONWORT	S				S
BOTRYCHIUM LUNARIA	MOONWORT	S	D			S
BOTRYCHIUM MONTANUM	MOUNTAIN GRAPE-FERN	S			S	S

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
BOTRYCHIUM PARADOXUM	TWIN-SPIKED MOONWART	S				S
BOTRYCHIUM PEDUNCULOSUM	STALKED MOONWORT	S				S
BOTRYCHIUM PUMICOLA	PUMICE GRAPE-FERN	S		S	D	
BUPLEURUM AMERICANUM	BUPLEURUM	S				D
CALLITRICHE MARGINATA	WINGED WATER-STARWORT	S			S	
CALOCHORTUS LONGEBARBATUS VAR. PECKII	PECK'S MARIPOSA-LILY	S	S		D	
CALOCHORTUS MACROCARPUS VAR. MACULOSUS	GREEN-BAND MARIPOSA-LILY	S				D
CALOCHORTUS NITIDUS	BROAD-FRUIT MARIPOSA-LILY	S				S
CAMISSONIA PYGMAEA	DWARF EVENING-PRIMROSE	S	S		D	S
CAREX ATROSQUAMA	BLACKENED SEDGE	S	S			S
CAREX CAPILLARIS	HAIRLIKE SEDGE	S	D			S
CAREX CAPITATA	CAPITATE SEDGE	S	D	S	S	
CAREX CORDILLERANA	CORDILLERAN SEDGE	S	D			D
CAREX DIANDRA	LESSER PANICLED SEDGE	S		D	S	
CAREX GYNOCRATES	YELLOW BOG SEDGE	S				S
CAREX IDAHOA	IDAHO SEDGE	S			S	S
CAREX LASIOCARPA VAR. AMERICANA	SLENDER SEDGE	S		D		S
CAREX MEDIA	INTERMEDIATE SEDGE	S				S
CAREX MICROPODA	PYRENAEAN SEDGE	S				S
CAREX NARDINA	SPIKENARD SEDGE	S				S
CAREX PELOCARPA	NEW SEDGE	S	D			S
CAREX RETRORSA	RETRORSE SEDGE	S			S	S
CAREX SCIRPOIDEA SSP. STENOCHLAENA	ALASKAN SINGLE-SPIKED SEDGE	S	S			
CAREX SUBNIGRICANS	DARK ALPINE SEDGE	S	D	S		S
CAREX TIOGANA	TIOGA PASS SEDGE	S	D			

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
CAREX VERNACULA	NATIVE SEDGE	S	D	S		S
CASTILLEJA CHLOROTICA	GREEN-TINGED PAINTBRUSH	S		S	D	
CASTILLEJA FLAVA VAR. RUSTICA	RURAL PAINTBRUSH	S				D
CASTILLEJA FRATERNA	FRATERNAL PAINTBRUSH	S				S
CASTILLEJA RUBIDA	PURPLE ALPINE PAINTBRUSH	S				S
CASTILLEJA THOMPSONII	THOMPSON'S PAINTBRUSH	S			S	
CAULANTHUS CRASSICAULIS VAR. GLABER	SMOOTH WILD CABBAGE	S				D
CAULANTHUS MAJOR VAR. NEVADENSIS	SLENDER WILD CABBAGE	S	S			D
CHAENACTIS XANTIANA	DESERT CHAENACTIS	S	D	D		D
CHAETADELPHA WHEELERI	WHEELER'S SKELETON-WEED	S	D			D
CHEILANTHES FEEI	FEE'S LIP-FERN	S		S		S
CISTANTHE ROSEA	ROSY PUSSYPAWS	S			S	
COLLOMIA RENACTA	BARREN VALLEY COLLOMIA	S	S			D
CRYPTOGRAMMA STELLERI	STELLER'S ROCKBRAKE	S				S
CYMOPTERUS ACAULIS VAR. GREELEYORUM	GREELEY'S CYMOPTERUS	S				D
CYMOPTERUS IBAPENSIS	IBAPAH WAVEWING	S	S			D
CYMOPTERUS NIVALIS	SNOWLINE SPRING-PARSLEY	S	D	D	S	
CYMOPTERUS PURPURASCENS	PURPLE CYMOPTERUS	S	D			
CYPERUS LUPULINUS SSP. LUPULINUS	A CYPERUS	S				S
CYPRIPEDIUM FASCICULATUM	CLUSTERED LADY'S-SLIPPER	S			S	S
DELPHINIUM BICOLOR	FLATHEAD LARKSPUR	S				D
DELPHINIUM NUTTALLII	NUTALL'S LARKSPUR	S			S	

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
DODECATHEON PULCHELLUM VAR. SHOSHONENSE	DARKTHROAT SHOOTINGSTAR	S				D
ELATINE BRACHYSPERMA	SHORT SEEDED WATERWORT	S	D	D	S	D
ELEOCHARIS BOLANDERI	BOLANDER'S SPIKERUSH	S	S	D	S	D
ERIGERON DISPARIPILUS	WHITE CUSHION ERIGERON	S				S
ERIGERON ENGELMANNII VAR. DAVISII	ENGELMANN'S DAISY	S				S
ERIGERON LATUS	BROAD FLEABANE	S	S			D
ERIOGONUM BRACHYANTHUM	SHORT-FLOWERED ERIOGONUM	S	D			
ERIOGONUM CHRYSOPS	GOLDEN BUCKWHEAT	S				D
ERIOGONUM CROSBYAE	CROSBY'S BUCKWHEAT	S	S	D		
ERIOGONUM CUSICKII	CUSICK'S BUCKWHEAT	S	D	D	S	
ERIOGONUM HOOKERI	HOOKER'S WILD BUCKWHEAT	S				D
ERIOGONUM PROCIDUUM	PROSTRATE BUCKWHEAT	S	S	D		D
ERIOGONUM SALICORNIOIDES	PLAYA BUCKWHEAT	S	S			D
ERIOGONUM UMBELLATUM VAR. GLABERRIMUM	GREEN BUCKWHEAT	S	S	D		
GALIUM SERPENTICUM SSP. WARNERENSE	WARNER MT. BEDSTRAW	S		D		
GENTIANA PROSTRATA	MOSS GENTIAN	S	D			
GENTIANELLA TENELLA SSP. TENELLA	SLENDER GENTIAN	S	D			
GEUM ROSSII VAR. TURBINATUM	SLENDER-STEMMED AVENS	S				S
GRATIOLA HETEROSEPALA	BOGGS LAKE HEDGE-HYSSOP	S	S	D		
HACKELIA CRONQUISTII	CRONQUIST'S STICKSEED	S				D
HACKELIA OPHIOBIA	THREE FORKS STICKSEED	S				D

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
HELIOTROPIUM CURASSAVICUM	SALT HELIOTROPE	S	D	D	S	D
HYMENOXYS LEMMONII	COOPER'S GOLDFLOWER	S		D		D
IVESIA RHYPARA VAR. RHYPARA	GRIMY IVESIA	S	S	D		D
IVESIA RHYPARA VAR. SHELLYI	SHELLY'S IVESIA	S	S	D		
IVESIA SHOCKLEYI	SHOCKLEY'S IVESIA	S		S		D
JUNCUS TRIGLUMIS VAR. ALBESCENS	THREE-FLOWERED RUSH	S				S
KOBRESIA MYOSUROIDES	BELLARD'S KOBRESIA	S	D			S
KOBRESIA SIMPLICIUSCULA	SIMPLE KOBRESIA	S				S
LEPIDIUM DAVISII	DAVIS' PEPPERGRASS	S	D			D
LIPOCARPHA ARISTULATA	ARISTULATE LIPOCARPHA	S		S		S
LISTERA BOREALIS	NORTHERN TWAYBLADE	S				S
LOMATIUM ERYTHROCARPUM	RED-FRUITED LOMATIUM	S				S
LOMATIUM FOENICULACEUM SSP. FIMBRIATUM	FRINGED DESERT-PARSLEY	S				D
LOMATIUM OCHOCENSE	OCHOCO LOMATIUM	S			D	
LOMATIUM ROSEANUM	ROSE'S LOMATIUM	S	S			D
LOMATIUM SUKSDORFII	SUKSDORF'S DESERT PARSLEY	S			D	
LOMATIUM WATSONII	WATSON'S DESERT PARSLEY	S			D	
LUINA SERPENTINA	COLONIAL LUINA	S			D	
LUPINUS CUSICKII VAR. CUSICKII	CUSICK'S LUPINE	S				D
LUPINUS NEVADENSIS	NEVADA LUPINE	S	S	D		D
LYCOPODIUM COMPLANATUM	GROUND CEDAR	S				S
MALACOTHRIX SONCHOIDES	LYRATE MALACOTHRIX	S	D	D		D
MENTZELIA CONGESTA	UNITED BLAZINGSTAR	S	D			D

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
MENTZELIA MOLLIS	SMOOTH MENTZELIA	S				D
MIMULUS EVANESCENS	DISAPPEARING MONKEYFLOWER	S	S	D	S	D
MIMULUS HYMENOPHYLLUS	MEMBRANE-LEAVED MONKEYFLOWER	S				S
MIMULUS LATIDENS	BROAD-TOOTHED MONKEYFLOWER	S		D		
MIMULUS TRICOLOR	THREE-COLORED MONKEY-FLOWER	S		D		
MIRABILIS MACFARLANEI	MACFARLANE'S FOUR O'CLOCK	FT				S
MUHLENBERGIA MINUTISSIMA	ANNUAL DROPSEED	S				D
OPHIOGLOSSUM PUSILLUM	ADDER'S-TONGUE	S				S
OXYTROPIS SERICEA VAR. SERICEA	WHITE LOCOWEED	S				D
PELLAEA BRIDGESII	BRIDGES' CLIFF-BRAKE	S				S
PENSTEMON GLAUCINUS	BLUE-LEAVED PENSTEMON	S		S		
PENSTEMON PECKII	PECK'S PENSTEMON	S			S	
PHACELIA INUNDATA	PLAYA PHACELIA	S	D	D		D
PHACELIA LUTEA VAR. MACKENZIEORUM	MACKENZIE'S PHACELIA	S				D
PHACELIA MINUTISSIMA	DWARF PHACELIA	S			S	S
PHEMERANTHUS SPINESCENS	SPINESCENT FAMEFLOWER	S			D	
PHLOX HENDERSONII	HENDERSON'S PHLOX	S				S
PHLOX MULTIFLORA	MANY-FLOWERED PHLOX	S				S
PHYSARIA CHAMBERSII	CHAMBERS' TWINPOD	S				D
PILULARIA AMERICANA	AMERICAN PILLWORT	S			D	
PINUS ALBICAULIS	WHITEBARK PINE	S				D
PLAGIOBOTHRYS SALSUS	DESERT ALLOCARYA	S		D		
PLATANTHERA OBTUSATA	SMALL NORTHERN BOG-ORCHID	S				S
PLEUROPOGON OREGONUS	OREGON SEMAPHOREGRASS	S		D		S

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
POGOGYNE FLORIBUNDA	PROFUSE-FLOWEREED MESA MINT	S		D		D
POTAMOGETON DIVERSIFOLIUS	RAFINESQUE'S PONDWEED	S	D			D
PRENANTHELLA EXIGUA	DESERT PRENANTHELLA	S				D
PYRROCOMA RADIATA	SNAKE RIVER GOLDENWEED	S				D
PYRROCOMA SCABERULA	ROUGH PYRROCOMA	S				D
RAFINESQUIA CALIFORNICA	CALIFORNIA CHICORY	S				D
RANUNCULUS TRITERNATUS	DALLES MT. BUTTERCUP	S			D	
RORIPPA COLUMBIAE	COLUMBIA CRESS	S	D	D	S	S
ROTALA RAMOSIOR	LOWLAND TOOTHCUP	S	S	S	S	
RUBUS BARTONIANUS	BARTONBERRY	S				D
SALIX FARRIAE	FARR'S WILLOW	S				S
SALIX WOLFII	WOLF'S WILLOW	S	D	S		S
SAXIFRAGA ADSCENDENS SSP. OREGONENSIS	WEDGE-LEAF SAXIFRAGE	S	D			S
SCHOENOPLECTUS SUBTERMINALIS	WATER CLUBRUSH	S		S		
SENECIO ERTTERAE	ERTTER'S SENECIO	S	S			D
SESUVIUM VERRUCOSUM	VERRUCOSE SEA-PURSLANE	S	D	D		
SILENE SPALDINGII	SPALDING'S CATCHFLY	FT				D
STANLEYA CONFERTIFLORA	BIENNIAL STANLEYA	S	D			D
STEPHANOMERIA MALHEURENSIS	MALHEUR WIRE-LETTUCE	FE	D			
SUKSDORFIA VIOLACEA	VIOLET SUKSDORFIA	S				S
SYMPHORICARPOS LONGIFLORUS	LONG-FLOWERED SNOWBERRY	S	D	D		D
THALICTRUM ALPINUM	ALPINE MEADOWRUE	S				S
THELYPODIUM BRACHYCARPUM	SHORT-PODDED THELYPODY	S		S		
THELYPODIUM EUCOSMUM	ARROW-LEAF THELYPODY	S			D	S

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
THELYPODIUM HOWELLII SSP. SPECTABILIS	HOWELL'S SPECTACULAR THELYPODY	FT				S
TOWNSENDIA MONTANA	MOUNTAIN TOWNSENDIA	S				S
TOWNSENDIA PARRYI	PARRY'S TOWNSENDIA	S				S
TRIFOLIUM DOUGLASII	DOUGLAS' CLOVER	S				S
TRIFOLIUM LEIBERGII	LEIBERG'S CLOVER	S	D	D		D
TRIFOLIUM OWYHEENSE	OWYHEE CLOVER	S				D
TROLLIUS LAXUS SSP. ALBIFLORUS	AMERICAN GLOBEFLOWER	S				S
UTRICULARIA MINOR	LESSER BLADDERWORT	S			S	S
INVERTIBRATE ANIMAL						
GONIDEA ANGULATA	WESTERN RIDGED MUSSEL	S	D	S	D	D
COLLIGYRUS DEPRESSUS	HARNEY BASIN DUSKYSNAIL	S	S			
CRYPTOMASTIX POPULI	HELLS CANYON LAND SNAIL	S				D
FISHEROLA NUTTALLI	SHORTFACE LANX	S			D	
FLUMINICOLA FUSCUS	COLUMBIA PEBBLESNAIL	S			S	
FLUMINICOLA INSOLITUS	DONNER UND BLITZEN PEBBLESNAIL	S	D			
HELISOMA NEWBERRYI NEWBERRYI	GREAT BASIN RAMSHORN	S		D		
JUGA HEMPHILLI DALLESENSIS	DALLES JUGA	S			D	
JUGA HEMPHILLI HEMPHILLI	BARREN JUGA	S			S	
JUGA HEMPHILLI MAUPINENSIS	PURPLE-LIPPED JUGA	S			D	
JUGA NEWBERRYI	A FRESHWATER SNAIL	S			D	
MONADENIA FIDELIS SSP. NOV. (DESCHUTES)	DESCHUTES SIDEBAND	S			D	
MONADENIA FIDELIS SSP. NOV. (MODOC RIM)	MODOC RIM SIDEBAND	S		D		
PYRGULOPSIS FRESTI	OWYHEE HOT SPRINGSNAIL	S				D

Table L-1
Special Status Species Documented (D) as Occurring or Suspected (S) to Occur on BLM-administered Lands Within the Planning Area

			Occurrence Status			
Scientific Name	**Common Name**	**Status**	**Burns**	**Lakeview**	**Prineville**	**Vale**
PYRGULOPSIS INTERMEDIA	CROOKED CREEK SPRINGSNAIL	S	S	S		D
PYRGULOPSIS OWYHEENSIS	A SPRINGSNAIL	S				D
PYRGULOPSIS ROBUSTA	JACKSON LAKE SPRINGSNAIL	S	S	S	S	D
MICRACANTHIA FENNICA	HARNEY HOT SPRING SHORE BUG	S	D			
VANDUZEEINA BOREALIS CALIFORNICA	CALIFORNIA SHIELD-BACKED BUG	S		S		
BOMBUS OCCIDENTALIS	WESTERN BUMBLEBEE	S		S		
BOLORIA SELENE	SILVER-BORDERED FRITILLARY	S			D	S

Appendix M

Standards for Rangeland Health and Guidelines for Livestock Grazing

STANDARDS FOR RANGELAND HEALTH

AND

GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

FOR

PUBLIC LANDS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT IN THE STATES OF OREGON AND WASHINGTON

AUGUST 12, 1997

Table of Contents

Introduction	1
Fundamentals of Rangeland Health	1
Standards for Rangeland Health	2
Standards and Guidelines in Relation to the Planning Process	3
Indicators of Rangeland Health	4
Assessments and Monitoring	5
Measurability	5
Implementation	6
Standards for Rangeland Health	7
Standard 1 Watershed Function - Uplands	7
Standard 2 Watershed Function -	9

Riparian/Wetland Areas	11
Standard 3 Ecological Processes	13
Standard 4 Water Quality	14
Standard 5 Native, T&E, and Locally Important Species	
Guidelines for Livestock Grazing Management	15
General Guidelines	15
Livestock Grazing Management	15
Facilitating the Management of Livestock	17
Grazing	17
Accelerating Rangeland Recovery	
Glossary	19

Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington

Introduction

These Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington were developed in consultation with Resource Advisory Councils and Provincial Advisory Committees, tribes and others. These standards and guidelines meet the requirements and intent of 43 Code of Federal Regulations, Subpart 4180 (Rangeland Health) and are to be used as presented, in their entirety. These standards and guidelines are intended to provide a clear statement of agency policy and direction for those who use public lands for livestock grazing, and for those who are responsible for their management and accountable for their condition. Nothing in this document should be interpreted as an abrogation of Federal trust responsibilities in protection of treaty rights of Indian tribes or any other statutory responsibilities including, but not limited to, the Taylor Grazing Act, the Clean Water Act, and the Endangered Species Act.

Fundamentals of Rangeland Health

The objectives of the rangeland health regulations referred to above are: "to promote healthy sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; . . . and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands."

To help meet these objectives, the regulations on rangeland health identify fundamental principles providing direction to the States, districts, and on-the-ground public land managers and users in the management and use of rangeland ecosystems.

A hierarchy, or order, of ecological function and process exists within each ecosystem. The rangeland ecosystem consists of four primary, interactive components: a physical component, a biological component, a social component, and an economic component. This perspective implies that the physical function of an ecosystem supports the biological health, diversity and productivity of that system. In turn, the interaction of the physical and biological components of the ecosystem provides the basic needs of society and supports economic use and potential.

The Fundamentals of Rangeland Health stated in 43 CFR 4180 are:

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity and the timing and duration of flow.

2. Ecological processes, including the hydrologic cycle, nutrient cycle and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

3. Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established Bureau of Land Management objectives such as meeting wildlife needs.

4. Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

The fundamentals of rangeland health combine the basic precepts of physical function and biological health with elements of law relating to water quality, and plant and animal populations and communities. They provide direction in the development and implementation of the standards for rangeland health.

Standards for Rangeland Health

The standards for rangeland health (standards), based on the above fundamentals, are expressions of the physical and biological condition or degree of function necessary to sustain healthy rangeland ecosystems. Although the focus of these standards is on domestic livestock grazing on Bureau of Land Management lands, on-the-ground decisions must consider the effects and impacts of all uses.

Standards that address the physical components of rangeland ecosystems focus on the roles and interactions of geology and landform, soil, climate and water as they govern watershed function and soil stability. The biological components addressed in the standards focus on the roles and interactions of plants, animals and microbes (producers, consumers and decomposers), and their habitats in the ecosystem. The biological component of rangeland ecosystems is supported by physical function of the system, and it is recognized that biological activity also influences and supports many of the ecosystem's physical functions.

Guidance contained in 43 CFR 4180 of the regulations directs management toward the maintenance or restoration of the physical function and biological health of rangeland ecosystems. Focusing on the basic ecological health and function of rangelands is expected to provide for the maintenance, enhancement, or creation of future social and economic options.

The standards are based upon the ecological potential and capability of each site. In assessing a site's condition or degree of function, it must be understood that the evaluation compares each site to its own potential or capability. Potential and capability are defined as follows:

Potential-The highest level of condition or degree of function a site can attain given no political, social or economic constraints.

Capability-The highest level of condition or degree of function a site can attain given certain political, social or economic constraints. For example, these constraints might include riparian areas permanently occupied by a highway or railroad bed that prevent the stream's full access to its original flood plain. If such constraints are removed, the site may be able to move toward its potential.

In designing and implementing management strategies to meet the standards of rangeland health, the potential of the site must be identified, and any constraints recognized, in order that plan goals and objectives are realistic and physically and economically achievable.

Standards and Guidelines in Relation to the Planning Process

The standards apply to the goals of land use plans, activity plans, and project plans (Allotment Management Plans, Annual Operating Plans, Habitat Management Plans, etc.). They establish the physical and biological conditions or degree of function toward which management of publicly-owned rangeland is to be directed. In the development of a plan, direction provided by the standards and the social and economic needs expressed by local communities and individuals are brought together in formulating the goal(s) of that plan.

When the standards and the social and economic goals of the planning participants are woven together in the plan goal(s), the quantifiable, time specific objective(s) of the plan are then developed. Objectives describe and quantify the desired future conditions to be achieved within a specified time frame. Each plan objective should address the physical, biological, social and economic elements identified in the plan goal.

Standards apply to all ecological sites and land forms on public rangelands throughout Oregon and Washington. The standards require site-specific information for full on-ground usability. For each standard, a set of indicators is identified for use in tailoring the standards to site-specific situations. These indicators are used for rangeland ecosystem assessments and monitoring and for developing terms and conditions for permits and leases that achieve the plan goal.

Guidelines for livestock grazing management offer guidance in achieving the plan goal and objectives. The guidelines outline practices, methods, techniques and considerations used to ensure that progress is achieved in a way, and at a rate, that meets the plan goal and objectives.

Indicators of Rangeland Health

The condition or degree of function of a site in relation to the standards and its trend toward or away from any standard is determined through the use of reliable and scientifically sound indicators. The consistent application of such indicators can provide an objective view of the condition and trend of a site when used by trained observers.

For example, the amount and distribution of ground cover can be used to indicate that infiltration at the soil surface can take place as described in the standard relating to upland watershed function. In applying this indicator, the specific levels of plant cover necessary to support infiltration in a particular soil should be identified using currently available information from reference areas, if they exist; from technical sources like soil survey reports, Ecological Site Inventories, and Ecological Site Descriptions, or from other existing reference materials. Reference areas are lands that best represent the potential of a specific ecological site in both physical function and biological health. In many instances potential reference areas are identified in Ecological Site Descriptions and are referred to as "type locations." In the absence of suitable reference areas, the selection of indicators to be used in measuring or judging condition or function should be made by an interdisciplinary team of experienced professionals and other trained individuals.

Not all indicators identified for each standard are expected to be employed in every situation. Criteria for selecting appropriate indicators and methods of measurement and observation include, but are not limited to: 1. the relationship between the attribute(s) being measured or observed and the desired outcome; 2. the relationship between the activity (e.g., livestock grazing) and the attribute(s) being measured or observed; and 3. funds and workforce available to conduct the measurements or observations.

Assessments and Monitoring

The standards are the basis for assessing and monitoring rangeland condition and trend. Carrying out well-designed assessment and monitoring is critical to restoring or maintaining healthy rangelands and determining trends and conditions.

Assessments are a cursory form of evaluation based on the standards that can be used at different landscape scales. Assessments, conducted by qualified interdisciplinary teams (which may include but are not limited to physical, biological and social specialists, and interagency personnel) with participation from permittees and other interested parties, are appropriate at the watershed and sub-watershed levels, at the allotment and pasture levels and on individual ecological sites or groups of sites. Assessments identify the condition or degree of function within the rangeland ecosystem and indicate resource problems and issues that should be monitored or studied in more detail. The results of assessments are a valuable tool for managers in assigning priorities within an administrative area and the subsequent allocation of personnel, money and time in resource monitoring and treatment. The results of assessments may also be used in making management decisions where an obvious problem exists.

Monitoring, which is the well documented and orderly collection, analysis and interpretation of resource data, serves as the basis for determining trends in the condition or degree of function of rangeland resources and for making management decisions. Monitoring should be designed and carried out to identify trends in resource conditions, to point out resource problems, to help indicate the cause of such problems, to point out solutions, and/or to contribute to adaptive management decisions. In cases where monitoring data do not exist, professional judgement, supported by interdisciplinary team recommendation, may be relied upon by the authorized officer in order to take necessary action. Review and evaluation of new information must be an ongoing activity.

To be effective, monitoring must be consistent over time, throughout administrative areas, and in the methods of measurement and observation of selected indicators. Those doing the monitoring must have the knowledge and skill required by the level or intensity of the monitoring being done, as well as the experience to properly interpret the results. Technical support for training must be made available.

Measurability

It is recognized that not every area will immediately meet the standards and that it will sometimes be a long-term process to restore some rangelands to properly functioning condition. It is intended that in cases where standards are not being met, measurable progress should be made toward achieving those standards, and significant progress should be made toward fulfilling the fundamentals of rangeland health. Measurability is defined on a case-specific basis based upon the stated planning objectives (i.e., quantifiable, time specific), taking into account economic and social goals along with the biological and ecological capability of the area. To the extent that a rate of recovery

conforms with the planning objectives, the area is allowed the time to meet the standard under the selected management regime.

Implementation

The material contained in this document will be incorporated into existing Land Use Plans and used in the development of new Land Use Plans. According to 43 CFR 4130.3-1, permits and leases shall incorporate terms and conditions that ensure conformance with 43 CFR 4180. Terms and conditions of existing permits and leases will be modified to reflect standards and guidelines at the earliest possible date with priority for modification being at the discretion of the authorized officer. Terms and conditions of new permits and leases will reflect standards and guidelines in their development.

Indicators identified in this document will serve as a focus of interpretation of existing monitoring data and will provide the basis of design for monitoring and assessment techniques, and in the development of monitoring and assessment plans.

The authorized officer shall take appropriate action as soon as practicable but not later than the start of the next grazing year upon determining, through assessment or monitoring by experienced professionals and interdisciplinary teams, that a standard is not being achieved and that livestock are a significant contributing factor to the failure to achieve the standards and conform with the guidelines.

Standards for Rangeland Health

Standard 1 Watershed Function - Uplands

Upland soils exhibit infiltration and permeability rates, moisture storage and stability that are appropriate to soil, climate and landform.

Rationale and Intent

This standard focuses on the basic physical functions of upland soils that support plant growth, the maintenance or development of plant populations and communities, and promote dependable flows of quality water from the watershed.

To achieve and sustain rangeland health, watersheds must function properly. Watersheds consist of three principle components: the uplands, riparian/wetland areas and the aquatic zone. This standard addresses the upland component of the watershed. When functioning properly, within its potential, a watershed captures, stores and safely releases the moisture associated with normal precipitation events (equal to or less than the 25 year, 5 hour event) that falls within its boundaries. Uplands make up the largest part of the

watershed and are where most of the moisture received during precipitation events is captured and stored.

While all watersheds consist of similar components and processes, each is unique in its individual makeup. Each watershed displays its own pattern of landform and soil, its unique climate and weather patterns, and its own history of use and current condition. In directing management toward achieving this standard, it is essential to treat each unit of the landscape (soil, ecological site, and watershed) according to its own capability and how it fits with both smaller and larger units of the landscape.

A set of potential indicators has been identified for which site-specific criteria will be used to determine if this standard is being met. The appropriate indicators to be used in determining attainment of the standard should be drawn from the following list.

Potential Indicators

Protection of the soil surface from raindrop impact; detention of overland flow; maintenance of infiltration and permeability, and protection of the soil surface from erosion, consistent with the potential/capability of the site, as evidenced by the:

- amount and distribution of plant cover (including forest canopy cover);
- amount and distribution of plant litter;
- accumulation/incorporation of organic matter;
- amount and distribution of bare ground;
- amount and distribution of rock, stone, and gravel;
- plant composition and community structure;
- thickness and continuity of A horizon;
- character of microrelief;
- presence and integrity of biotic crusts;
- root occupancy of the soil profile;
- biological activity (plant, animal, and insect); and
- absence of accelerated erosion and overland flow.

Soil and plant conditions promote moisture storage as evidenced by:

- amount and distribution of plant cover (including forest canopy cover);
- amount and distribution of plant litter;
- plant composition and community structure; and
- accumulation/incorporation of organic matter.

Standard 2 Watershed Function - Riparian/Wetland Areas

Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.

Rationale and Intent

Riparian-wetland areas are grouped into two major categories: 1. lentic, or standing water systems such as lakes, ponds, seeps, bogs, and meadows; and 2. lotic, or moving water systems such as rivers, streams, and springs. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Riparian areas commonly occupy the transition zone between the uplands and surface water bodies (the aquatic zone) or permanently saturated wetlands.

Properly functioning condition of riparian and wetland areas describes the degree of physical function of these components of the watershed. Their functionality is important to water quality in the capture and retention of sediment and debris, the detention and detoxification of pollutants, and in moderating seasonal extremes of water temperature. Properly functioning riparian areas and wetlands enhance the timing and duration of streamflow through dissipation of flood energy, improved bank storage, and ground water recharge. Properly functioning condition should not be confused with the Desired Plant Community (DPC) or the Desired Future Condition (DFC) since, in most cases, it is the precursor to these levels of resource condition and is required for their attainment.

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met. The criteria are based upon the potential (or upon the capability where potential cannot be achieved) of individual sites or land forms.

Potential Indicators

Hydrologic, vegetative, and erosional/depositional processes interact in supporting physical function, consistent with the potential or capability of the site, as evidenced by:

- frequency of floodplain/wetland inundation;
- plant composition, age class distribution, and community structure;
- root mass;
- point bars revegetating;
- streambank/shoreline stability;
- riparian area width;
- sediment deposition;
- active/stable beaver dams;
- coarse/large woody debris;
- upland watershed conditions;
- frequency/duration of soil saturation; and
- water table fluctuation.

Stream channel characteristics are appropriate for landscape position as evidenced by:

- channel width/depth ratio;

- channel sinuosity;
- gradient;
- rocks and coarse and/or large woody debris;
- overhanging banks;
- pool/riffle ratio;
- pool size and frequency; and
- stream embeddedness.

Standard 3 Ecological Processes

Healthy, productive and diverse plant and animal populations and communities appropriate to soil, climate and landform are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

Rationale and Intent

This standard addresses the ecological processes of energy flow and nutrient cycling as influenced by existing and desired plant and animal communities without establishing the kinds, amounts or proportions of plant and animal community compositions. While emphasis may be on native species, an ecological site may be capable of supporting a number of different native and introduced plant and animal populations and communities while meeting this standard. This standard also addresses the hydrologic cycle which is essential for plant growth and appropriate levels of energy flow and nutrient cycling. Standards 1 and 2 address the watershed aspects of the hydrologic cycle.

With few exceptions, all life on earth is supported by the energy supplied by the sun and captured by plants in the process of photosynthesis. This energy enters the food chain when plants are consumed by insects and herbivores and passes upward through the food chain to the carnivores. Eventually, the energy reaches the decomposers and is released as the thermal output of decomposition or through oxidation.

The ability of plants to capture sunlight energy, to grow and develop, to play a role in soil development and watershed function, to provide habitat for wildlife and to support economic uses depends on the availability of nutrients and moisture. Nutrients necessary for plant growth are made available to plants through the decomposition and metabolization of organic matter by insects, bacteria and fungi, the weathering of rocks and extraction from the atmosphere. Nutrients are transported through the soil by plant uptake, leaching and by rodent, insect and microbial activity. They follow cyclical patterns as they are used and reused by living organisms.

The ability of rangelands to supply resources and satisfy social and economic needs depends on the buildup and cycling of nutrients over time. Interrupting or slowing

nutrient cycling can lead to site degradation, as these lands become increasingly deficient in the nutrients plants require.

Some plant communities, because of past use, frequent fire or other histories of extreme or continued disturbance, are incapable of meeting this standard. For example, shallow-rooted winter-annual grasses that completely dominate some sites do not fully occupy the potential rooting depth of some soils, thereby reducing nutrient cycling well below optimum levels. In addition, these plants have a relatively short growth period and thus capture less sunlight than more diverse plant communities. Plant communities like those cited in this example are considered to have crossed the threshold of recovery and often require great expense to be recovered. The cost of recovery must be weighed against the site's potential ecological/economic value in establishing treatment priorities.

The role of fire in natural ecosystems should be considered, whether it acts as a primary driver or only as one of many factors. It may play a significant role in both nutrient cycling and energy flows.

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met.

Potential Indicators

Photosynthesis is effectively occurring throughout the potential growing season, consistent with the potential/capability of the site, as evidenced by plant composition and community structure.

Nutrient cycling is occurring effectively, consistent with the potential/capability of the site, as evidenced by:

- plant composition and community structure;
- accumulation, distribution, incorporation of plant litter and organic matter into the soil;
- animal community structure and composition;
- root occupancy in the soil profile; and
- biological activity including plant growth, herbivory, and rodent, insect and microbial activity.

Standard 4 Water Quality

Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

Rationale and Intent

The quality of the water yielded by a watershed is determined by the physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, the uses to which the land is put and the quality of the management of those uses. Standards 1, 2 and 3 contribute to attaining this standard.

States are legally required to establish water quality standards and Federal land management agencies are to comply with those standards. In mixed ownership watersheds, agencies, like any other land owners, have limited influence on the quality of the water yielded by the watershed. The actions taken by the agency will contribute to meeting State water quality standards during the period that water crosses agency administered holdings.

Potential Indicators

Water quality meets applicable water quality standards as evidenced by:

- water temperature;
- dissolved oxygen;
- fecal coliform;
- turbidity;
- pH;
- populations of aquatic organisms; and
- effects on beneficial uses (i.e., effects of management activities on beneficial uses as defined under the Clean Water Act and State implementing regulations).

Standard 5 Native, T&E, and Locally Important Species

Habitats support healthy, productive and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate and landform.

Rationale and Intent

Federal agencies are mandated to protect threatened and endangered species and will take appropriate action to avoid the listing of any species. This standard focuses on retaining and restoring native plant and animal (including fish) species, populations and communities (including threatened, endangered and other special status species and species of local importance). In meeting the standard, native plant communities and animal habitats would be spatially distributed across the landscape with a density and frequency of species suitable to ensure reproductive capability and sustainability. Plant populations and communities would exhibit a range of age classes necessary to sustain recruitment and mortality fluctuations.

Potential Indicators

Essential habitat elements for species, populations and communities are present and available, consistent with the potential/capability of the landscape, as evidenced by:

- plant community composition, age class distribution, productivity;
- animal community composition, productivity;
- habitat elements;
- spatial distribution of habitat;
- habitat connectivity; and
- population stability/resilience.

Guidelines for Livestock Grazing Management

Guidelines for livestock grazing management offer guidance in achieving plan goals, meeting standards for rangeland health and fulfilling the fundamentals of rangeland health. Guidelines are applied in accordance with the capabilities of the resource in consultation, cooperation, and coordination with permittees/lessees and the interested public. Guidelines enable managers to adjust grazing management on public lands to meet current and anticipated climatic and biological conditions.

General Guidelines

1. Involve diverse interests in rangeland assessment, planning and monitoring.

2. Assessment and monitoring are essential to the management of rangelands, especially in areas where resource problems exist or issues arise. Monitoring should proceed using a qualitative method of assessment to identify critical, site-specific problems or issues using interdisciplinary teams of specialists, managers, and knowledgeable land users.

Once identified, critical, site-specific problems or issues should be targeted for more intensive, quantitative monitoring or investigation. Priority for monitoring and treatment should be given to those areas that are ecologically at-risk where benefits can be maximized given existing budgets and other resources.

Livestock Grazing Management

1. The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to:

    a. provide adequate cover (live plants, plant litter and residue) to promote

infiltration, conserve soil moisture and to maintain soil stability in upland areas;

b. provide adequate cover and plant community structure to promote streambank stability, debris and sediment capture, and floodwater energy dissipation in riparian areas.

c. promote soil surface conditions that support infiltration;

d. avoid sub-surface soil compaction that retards the movement of water in the soil profile;

e. help prevent the increase and spread of noxious weeds;

f. maintain or restore diverse plant populations and communities that fully occupy the potential rooting volume of the soil;

g. maintain or restore plant communities to promote photosynthesis throughout the potential growing season;

h. promote soil and site conditions that provide the opportunity for the establishment of desirable plants;

i. protect or restore water quality; and

j. provide for the life cycle requirements, and maintain or restore the habitat elements of native (including T&E, special status, and locally important species) and desired plants and animals.

2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.

3. Grazing management systems should consider nutritional and herd health requirements of the livestock.

4. Integrate grazing management systems into the year-round management strategy and resources of the permittee(s) or lessee(s). Consider the use of collaborative approaches (e.g., Coordinated Resource Management, Working Groups) in this integration.

5. Consider competition for forage and browse among livestock, big game animals, and wild horses in designing and implementing a grazing plan.

6. Provide periodic rest from grazing for rangeland vegetation during critical growth periods to promote plant vigor, reproduction and productivity.

7. Range improvement practices should be prioritized to promote rehabilitation and resolve grazing concerns on transitory grazing land.

8. Consider the potential for conflict between grazing use on public land and adjoining land uses in the design and implementation of a grazing management plan.

Facilitating the Management of Livestock Grazing

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used where appropriate to:

    a. promote livestock distribution;

    b. encourage a uniform level of proper grazing use throughout the grazing unit;

    c. avoid unwanted or damaging concentrations of livestock on streambanks, in riparian areas and other sensitive areas such as highly erodible soils, unique wildlife habitats and plant communities; and

    d. protect water quality.

2. Roads and trails used to facilitate livestock grazing are constructed and maintained in a manner that minimizes the effects on landscape hydrology; concentration of overland flow, erosion and sediment transport are prevented; and subsurface flows are retained.

Accelerating Rangeland Recovery

1. Upland treatments that alter the vegetative composition of a site, like prescribed burning, juniper management and seedings or plantings must be based on the potential of the site and should:

    a. retain or promote infiltration, permeability, and soil moisture storage;

    b. contribute to nutrient cycling and energy flow;

    c. protect water quality;

d. help prevent the increase and spread of noxious weeds;

e. contribute to the diversity of plant communities, and plant community composition and structure;

f. support the conservation of T&E, other special status species and species of local importance; and

g. be followed up with grazing management and other treatments that extend the life of the treatment and address the cause of the original treatment need.

2. Seedings and plantings of non-native vegetation should only be used in those cases where native species are not available in sufficient quantities; where native species are incapable of maintaining or achieving the standards; or where non-native species are essential to the functional integrity of the site.

3. Structural and vegetative treatments and animal introductions in riparian and wetland areas must be compatible with the capability of the site, including the system's hydrologic regime, and contribute to the maintenance or restoration of properly functioning condition.

Glossary

Appropriate action-implementing actions pursuant to subparts 4110, 4120, 4130 and 4160 of the regulations that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with the guidelines. (see **Significant progress**)

Assessment-a form of evaluation based on the standards of rangeland health, conducted by an interdisciplinary team at the appropriate landscape scale (pasture, allotment, sub-watershed, watershed, etc.) to determine conditions relative to standards.

Compaction layer-a layer within the soil profile in which the soil particles have been rearranged to decrease void space, thereby increasing soil bulk density and often reducing permeability.

Crust, Abiotic-(physical crust) a surface layer on soils, ranging in thickness from a few millimeters to a few centimeters, that is much more compact, hard and brittle, when dry, than the material immediately beneath it.

Crust, Biotic-(microbiotic or cryptogamic crust) a layer of living organisms (mosses, lichens, liverworts, algae, fungi, bacteria, and/or cyanobacteria) occurring on, or near the soil surface.

Degree of function-a level of physical function relative to properly functioning condition commonly expressed as: properly functioning, functioning-at-risk, or non-functional.

Diversity-the aggregate of species assemblages (communities), individual species, and the genetic variation within species and the processes by which these components interact within and among themselves. The elements of diversity are: 1. community diversity (habitat, ecosystem), 2. species diversity; and 3. genetic diversity within a species; all three of which change over time.

Energy flow-the processes in which solar energy is converted to chemical energy through photosynthesis and passed through the food chain until it is eventually dispersed through respiration and decomposition.

Ground water-water in the ground that is in the zone of saturation; water in the ground that exists at, or below the water table.

Guideline-practices, methods, techniques and considerations used to ensure that progress is made in a way and at a rate that achieves the standard(s).

Gully-a channel resulting from erosion and caused by the concentrated but intermittent flow of water usually during and immediately following heavy rains.

Hydrologic cycle-the process in which water enters the atmosphere through evaporation, transpiration, or sublimation from the oceans, other surface water bodies, or from the land and vegetation, and through condensation and precipitation returns to the earth's surface. The precipitation then occurring as overland flow, stream flow, or percolating underground flow to the oceans or other surface water bodies or to other sites of evapo-transpiration and recirculation to the atmosphere.

Indicators-parameters of ecosystem function that are observed, assessed, measured, or monitored to directly or indirectly determine attainment of a standard(s).

Infiltration-the downward entry of water into the soil.

Infiltration rate-the rate at which water enters the soil.

Nutrient cycling-the movement of essential elements and inorganic compounds between the reservoir pool (soil, for example) and the cycling pool (organisms) in the rapid exchange (i.e., moving back and forth) between organisms and their immediate environment.

Organic matter-plant and animal residues accumulated or deposited at the soil surface; the organic fraction of the soil that includes plant and animal residues at various stages of decomposition; cells and tissues of soil organisms, and the substances synthesized by the soil population.

Permeability-the ease with which gases, liquids or plant roots penetrate or pass through a bulk mass of soil or a layer of soil.

Properly functioning condition-Riparian-wetland: adequate vegetation, landform, or large (coarse) woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid in flood plain development; improve flood-water retention and ground water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse channel and ponding characteristics to provide the habitat and water depth, duration and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The result of interaction among geology, soil, water, and vegetation.

Uplands: soil and plant conditions support the physical processes of infiltration and moisture storage and promote soil stability (as appropriate to site potential); includes the production of plant cover and the accumulation of plant residue that protect the soil surface from raindrop impact, moderate soil temperature in minimizing frozen soil conditions (frequency, depth, and duration), and the loss of soil moisture to evaporation; root growth and development in the support of permeability and soil aeration. The result of interaction among geology, climate, landform, soil, and organisms.

Proper grazing use-grazing that, through the control of timing, frequency, intensity and duration of use, meets the physiological needs of the desirable vegetation, provides for the establishment of desirable plants and is in accord with the physical function and stability of soil and landform (properly functioning condition).

Reference area-sites that, because of their condition and degree of function, represent the ecological potential or capability of similar sites in an area or region (ecological province); serve as a benchmark in determining the ecological potential of sites with similar soil, climatic, and landscape characteristics.

Rill-a small, intermittent water course with steep sides; usually only a few inches deep.

Riparian area-a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and stream, glacial potholes, and shores of lakes and reservoirs with stable water levels area 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. Includes, but is not limited to, jurisdictional wetlands.

Significant progress-when used in reference to achieving a standard: (actions), the necessary land treatments, practices and/or changes to management have been applied or are in effect; (rate), a rate of progress that is consistent with the anticipated recovery rate described in plan objectives, with due recognition of the effects of climatic extremes (drought, flooding, etc.), fire, and other unforeseen naturally occurring events or disturbances. Monitoring reference areas that are ungrazed and properly grazed may provide evidence of appropriate recovery rates. (See Proper Grazing Use)

Soil density-(bulk density)-the mass of dry soil per unit bulk volume.

Soil moisture-water contained in the soil; commonly used to describe water in the soil above the water table.

Special status species-species proposed for listing, officially listed (T/E), or candidates for listing as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered Species Act; those listed or proposed for listing by the State in a category implying potential endangerment or extinction; those designated by each Bureau of Land Management State Director as sensitive.

Species of local importance-species of significant importance to Native American populations (e.g., medicinal and food plants).

Standard-an expression of the physical and biological condition or degree of function necessary to sustain healthy rangeland ecosystems.

Uplands-lands that exist above the riparian/wetland area, or active flood plains of rivers and streams; those lands not influenced by the water table or by free or unbound water; commonly represented by toe slopes, alluvial fans, and side slopes, shoulders and ridges of mountains and hills.

Watershed-an area of land that contributes to the surface flow of water past a given point. The watershed dimensions are determined by the point past, or through which, runoff flows.

Watershed function-the principal functions of a watershed include the capture of moisture contributed by precipitation; the storage of moisture within the soil profile, and the release of moisture through subsurface flow, deep percolation to groundwater, evaporation from the soil, and transpiration by live vegetation.

Wetland-areas that are inundated or saturated by surface or ground water 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.

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Appendix N

Rangeland Health Standards by Grazing Allotment

DISTRICT NAME	RMP	BLM GRSG Habitat	ALLOTMENT NUMBER	ALLOTMENT NAME	TOTAL ALLOTMENT AUMS	Allotment Management Category	Standard 1: Upland	Standard 2: Riparian	Standard 3: Ecological	Standard 4: Water Quality	Standard 5: Native, Threatened and Endangered
Burns	Three Rivers	PGH	05536	ALDER CREEK	2584	I	*	*	*	*	*
Burns	Andrews	PGH	06012	ALVORD ALLOTMENT	7355	I	*	*	*	*	*
Burns	Andrews	PGH	06042	BASQUE HILLS	1047	I	*	na	*	na	*
Burns	Three Rivers	PGH	05604	BURNT FLAT	3863	I	*	*	x	*	*
Burns	Three Rivers	PGH	02246	CAMP CURREY FFR	8	I	*	*	*	*	*
Burns	Three Rivers	PGH	07062	CAPEHART LAKE	1500	I	xl	*	*	*	xl
Burns	Andrews	PGH	06027	CARLSON CREEK ALLOT.	688	I	*	*	*	*	*
Burns	Three Rivers	PGH	07010	CLAW CREEK	2861	I	*	xl	*	xl	xl
Burns	Three Rivers	PPH	05514	COAL MINE CREEK	452	I	*	*	*	*	*
Burns	Three Rivers	PGH	05106	COW CREEK	230	I	*	xl	*	*	*
Burns	Three Rivers	PPH	05524	DAWSON BUTTE	614	I	xl	*	xl	x	x
Burns	Three Rivers	PGH	05223	EAST DAVIES	114	I	*	*	*	*	*
Burns	Andrews	PGH	06010	EAST RIDGE	720	I	*	*	*	*	*
Burns	Three Rivers	PGH	07024	EAST SAGEHEN	2510	I	*	*	*	*	*
Burns	Three Rivers	PGH	07041	EAST SILVIES	594	I	*	*	*	*	*
Burns	Three Rivers	PGH	07003	EAST WAGONTIRE	6667	I	*	*	*	*	*
Burns	Three Rivers	PPH	07001	EAST WARM SPRINGS	7594	I	*	*	*	*	*
Burns	Andrews	PGH	06028	FIELDS	1910	I	*	*	*	*	*
Burns	Andrews	PGH	06035	FIELDS BASIN	3506	I	X	x	*	xl	*
Burns	Three Rivers	PGH	07049	FORKS OF POISON CR	648	I	*	*	*	*	*
Burns	Andrews	PPH	06006	FRAZIER FIELD	1906	I	*	na	*	*	*
Burns	Three Rivers	PGH	00044	G.I.	10723	I	*	*	*	*	*
Burns	Three Rivers	PGH	07025	GOULDIN	567	I	x	*	*	*	*
Burns	Three Rivers	PGH	05601	HAMILTON	270	I	*	*	*	*	*
Burns	Andrews	PGH	06023	HAMMOND	473	I	*	*	*	*	*
Burns	Three Rivers	PGH	07007	HAT BUTTE	4418	I	*	*	*	*	*
Burns	Three Rivers	PGH	07031	HAY CREEK	585	I	*	*	*	x	*
Burns	Three Rivers	PGH	07036	HAYES	431	I	*	*	*	*	*
Burns	Three Rivers	PGH	07026	HORTON MILL	450	I	*	*	*	*	*
Burns	Three Rivers	PPH	05558	J&G F.F.R.	33	I	*	*	*	*	*
Burns	Andrews	PGH	06029	KEG SPRINGS	1791	I	*	na	*	*	*
Burns	Andrews	PGH	06008	KRUMBO ALLOTMENT	4150	I	*	na	*	*	*
Burns	Three Rivers	PPH	05571	LAMB RANCH	246	I	*	*	*	*	*

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Burns	Three Rivers	PGH	07040	LANDING CREEK	740	I	*	*	*	*	*
Burns	Andrews	PGH	06031	LAVOY TABLES	1653	I	*	*	*	*	*
Burns	Lakeview	PGH	01000	LITTLE JUNIPER SPRINGS	5417	I	*	*	*	*	*
Burns	Three Rivers	PGH	07043	LONE PINE	2147	I	*	*	*	*	*
Burns	Andrews	PGH	06044	LOWER ANTELOPE	500	I	*	na	*	na	*
Burns	Three Rivers	PGH	05534	MAHON CREEK	273	I	x	*	x	*	x
Burns	Andrews	PGH	06026	MANN LAKE ALLOT.	3670	I	*	*	*	*	*
Burns	Three Rivers	PGH	05535	MILLER CANYON	450	I	*	*	*	*	*
Burns	Three Rivers	PGH	05511	MOFFET TABLE	1885	I	*	*	*	*	x
Burns	Three Rivers	PGH	05532	MOUNTAIN	3374	I	*	xl	*	x	*
Burns	Andrews	PPH	06005	MUD CREEK ALLOTMENT	590	I	*	*	x	*	x
Burns	Three Rivers	PGH	07058	NARROWS	300	I	*	*	*	*	*
Burns	Andrews	PGH	06121	NEUSCHWANDER FFR	43	I	*	na	*	na	*
Burns	Andrews	PGH	06001	NORTH CATLOW	4424	I	*	na	*	*	*
Burns	Three Rivers	PGH	05517	OTIS MOUNTAIN	1738	I	*	*	*	*	*
Burns	Three Rivers	PGH	07012	PACKSADDLE	250	I		*	na	*	*
Burns	Three Rivers	PGH	07019	PALOMINO BUTTES	2806	I	*	*	*	*	*
Burns	Three Rivers	PGH	05503	PINE CREEK	2410	I	*	xl	*	xl	xl
Burns	Andrews	PGH	06011	POLLOCK ALLOTMENT	4107	I	*	*	*	*	*
Burns	Andrews	PGH	06020	PUEBLO LONE MTN	15305	I	*	*	*	*	*
Burns	Andrews	PGH	06043	PUEBLO SLOUGH	1612	I	*	na	*	*	*
Burns	Andrews	PGH	06030	REICKEN'S CORNER	688	I	*	na	*	*	*
Burns	Three Rivers	PPH	05310	RIDDLE MOUNTAIN	3095	I	*	*	*	x	x
Burns	Three Rivers	PGH	07006	RIMROCK LAKE	1775	I	*	*	*	*	*
Burns	Three Rivers	PGH	05530	RIVER	1649	I	*	xl	*	xl	xl
Burns	Three Rivers	PGH	07063	ROUNDTOP BUTTE	3092	I	*	*	*	*	*
Burns	Three Rivers	PGH	07009	RYEGRASS	2851	I	*	xl	*	xl	xl
Burns	Three Rivers	PGH	07015	SECOND FLAT	638	I	*	*	*	*	*
Burns	Andrews	PGH	06019	SERRANO POINT ALLOT.	500	I	*	na	*	na	*
Burns	Three Rivers	PGH	07008	SHEEP LAKE-SHIELDS	1710	I	*	*	*	*	*
Burns	Three Rivers	PPH	05513	SHELLY	600	I	*	xl	*	xl	xl
Burns	Three Rivers	PGH	04143	SILVIES	2500	I	*	*	*	*	*
Burns	Three Rivers	PGH	07033	SILVIES RIVER	699	I	*	xl	*	xl	xl

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Burns	Three Rivers	PGH	07030	SKULL CREEK	1959	I	*	*	*	x	x
Burns	Three Rivers	PGH	05331	SMYTH-KIGER	2295	I	*	xl	*	*	xl
Burns	Andrews	PGH	06002	SOUTH STEENS ALLOT.	9577	I	*	xl	*	xl	*
Burns	Three Rivers	PPH	05531	STINKINGWATER	2935	I	*	xl	*	xl	xl
Burns	Andrews	PGH	06040	STONEHOUSE	1772	I	*	*	*	*	*
Burns	Three Rivers	PGH	05566	TEXACO BASIN	2351	I	x	*	x	*	*
Burns	Three Rivers	PGH	04097	TROUT CREEK	420	I	*	*	*	*	*
Burns	Andrews	PGH	06015	TROUT CREEK MOUNTAIN	8352	I	*	*	*	*	*
Burns	Three Rivers	PGH	05523	TUB SPRINGS-HART	1002	I	*	*	*	*	x
Burns	Andrews	PGH	06018	TULE SPRINGS	5504	I	*	na	*	na	*
Burns	Three Rivers	PGH	05565	UPTON MOUNTAIN	1615	I	*	xl	*	*	xl
Burns	Three Rivers	PGH	05594	VENATOR	320	I	*	*	*	*	*
Burns	Three Rivers	PGH	07021	WEAVER LAKE	1396	I	*	*	*	*	*
Burns	Three Rivers	PGH	05221	WEST DAVIES	143	I	*	*	*	*	*
Burns	Three Rivers	PGH	07004	WEST WAGONTIRE	4959	I	*	*	*	*	*
Burns	Three Rivers	PGH	07002	WEST WARM SPRINGS	11006	I	*	xl	*	*	*
Burns	Three Rivers	PGH	07014	BADGER SPRING	1048	M	*	*	*	*	*
Burns	Three Rivers	PPH	05508	BAKER KNOWLES	58	M	*	*	*	*	*
Burns	Three Rivers	PGH	05600	BEAVER CREEK	1018	M	*	*	*	*	*
Burns	Three Rivers	PGH	05516	BIRCH CREEK	243	M	*	*	*	*	*
Burns	Three Rivers	PGH	05533	BUCHANAN	152	M	*	*	*	*	*
Burns	Three Rivers	PGH	05537	BUCK MOUNTAIN	1515	M	*	*	*	*	x
Burns	Three Rivers	PGH	05105	CAMP HARNEY	946	M	*	*	*	*	*
Burns	Three Rivers	PGH	07039	CAVE GULCH	209	M	na	na	na	na	na
Burns	Three Rivers	PGH	05526	CHALK HILLS	936	M	*	*	*	*	x
Burns	Andrews	PGH	06033	CHIMNEY	2015	M	*	*	*	*	*
Burns	Three Rivers	PGH	07017	CLUSTER	548	M	*	*	x	*	*
Burns	Three Rivers	PGH	05592	COLEMAN CREEK	424	M	na	na	na	na	na
Burns	Three Rivers	PGH	05528	COOLER	530	M	*	*	*	*	*
Burns	Three Rivers	PPH	05522	COTTONWOOD CREEK	996	M	*	xl	*	xl	xl
Burns	Three Rivers	PGH	05597	CRANE	183	M	na	na	na	na	na
Burns	Three Rivers	PGH	05101	DEVINE RIDGE	1307	M	*	x	*	x	x
Burns	Three Rivers	PPH	02252	DIETRICH FIELD FFR	7	M	*	*	*	*	*
Burns	Three Rivers	PGH	07022	DOG MOUNTAIN	175	M	*	*	*	*	*

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Burns	Three Rivers	PGH	07056	DOUBLE O	592	M	*	*	*	*	*
Burns	Three Rivers	PGH	05303	DRY LAKE	5000	M	*	xl	*	xl	*
Burns	Three Rivers	PGH	05501	EAST COW CREEK	809	M	*	*	*	*	*
Burns	Three Rivers	PGH	04098	EAST CREEK-PINE HILL	374	M	*	xl	*	xl	xl
Burns	Andrews	PGH	06017	GRASSY BASIN	942	M	*	*	*	*	*
Burns	Three Rivers	PGH	05309	HAPPY VALLEY	2107	M	xl	*	xl	x	x
Burns	Steens	PGH	06025	HARDIE SUMMER	408	M	*	*	*	*	*
Burns	Three Rivers	PPH	05529	HOUSE BUTTE	2085	M	*	*	*	*	*
Burns	Three Rivers	PGH	05202	HUNTER	453	M	*	*	*	*	*
Burns	Three Rivers	PPH	05510	JONES DRIPP SPRINGS	120	M	*	xl	*	xl	*
Burns	Three Rivers	PGH	07016	JUNIPER RIDGE	2076	M	*	*	*	*	*
Burns	Three Rivers	PGH	05320	KEGLER FFR	16	M	*	*	*	*	*
Burns	Three Rivers	PPH	05505	LITTLE MUDDY CREEK	286	M	*	*	*	*	*
Burns	Three Rivers	PPH	05576	LOWER PINE	376	M	*	*	*	*	*
Burns	Three Rivers	PGH	05599	MAHON RANCH	329	M	*	*	*	*	*
Burns	Three Rivers	PGH	05525	MILL GULCH	525	M	*	*	*	*	*
Burns	Three Rivers	PPH	05506	MUDDY CREEK	504	M	*	*	*	*	*
Burns	Three Rivers	PGH	05102	PRATHER CREEK	41	M	*	na	*	*	*
Burns	Three Rivers	PGH	05301	PRINCETON	2532	M	*	na	*	na	*
Burns	Three Rivers	PGH	05538	RIVERSIDE	2045	M	xl	xl	xl	xl	xl
Burns	Three Rivers	PGH	05527	RIVERSIDE F.F.R.	49	M	*	*	*	*	*
Burns	Three Rivers	PGH	05502	ROCK CREEK	526	M	*	*	*	*	*
Burns	Three Rivers	PGH	05521	ROCKY BASIN	467	M	*	*	*	*	*
Burns	Three Rivers	PGH	05306	ROCKY FORD	941	M	*	na	*	na	*
Burns	Andrews	PGH	06007	RUBY SPRINGS	1950	M	*	*	*	*	*
Burns	Andrews	PGH	06016	SANDHILLS	2294	M	*	x	*	na	*
Burns	Three Rivers	PGH	07051	SAWTOOTH-MNF	32	M	*	*	*	*	*
Burns	Three Rivers	PPH	05575	SCHOOL HOUSE	303	M	*	*	*	*	*
Burns	Three Rivers	PGH	07018	SILVER LAKE	1755	M	*	*	*	*	*
Burns	Three Rivers	PGH	07053	SILVIES CANYON	68	M	*	*	*	*	*
Burns	Three Rivers	PGH	07035	SILVIES MEADOWS	159	M	*	*	*	*	*
Burns	Three Rivers	PGH	05593	SLOCUM FIELD	300	M	na	na	na	na	na
Burns	Andrews	PPH	06024	SOUTH FORK	40	M	*	x	*	x	*

DISTRICT NAME	RMP	BLM GRSG Habitat	ALLOTMENT NUMBER	ALLOTMENT NAME	TOTAL ALLOTMENT AUMS	Allotment Management Category	Standard 1: Upland	Standard 2: Riparian	Standard 3: Ecological	Standard 4: Water Quality	Standard 5: Native, Threatened and Endangered
Burns	Three Rivers	PGH	05504	STATE FIELD	98	M	*	*	*	*	*
Burns	Three Rivers	PGH	07028	STINGER CREEK	4	M	xl	*	*	*	*
Burns	Andrews	PGH	06014	TUM TUM	730	M	*	*	*	na	*
Burns	Three Rivers	PGH	05316	VIRGINIA VALLEY	4428	M	*	*	*	*	*
Burns	Three Rivers	PGH	05564	WHEELER BASIN	618	M	*	*	*	*	*
Burns	Three Rivers	PPH	05509	WILLIAMS DRIPP SPGS.	176	M	*	xl	xl	xl	xl
Burns	Three Rivers	PPH	05507	WOLF CREEK	135	M	*	*	*	*	*
Burns	Three Rivers	PGH	05563	ARNOLD F.F.R.	23	C	*	*	*	*	*
Burns	Three Rivers	PGH	07046	BAKER HILL FIELD	20	C	*	*	*	*	*
Burns	Three Rivers	PGH	01002	BAR 75 RANCH FRF	73	C	*	*	*	*	*
Burns	Three Rivers	PGH	05573	BEAVER FFR	39	C	na	na	na	na	na
Burns	Three Rivers	PGH	05598	BECKLEY HOME	113	C	na	na	na	na	na
Burns	Three Rivers	PGH	05218	BENNETT F.F.R.	18	C	na	na	na	na	na
Burns	Three Rivers	PPH	05519	BIG UPSON FIELD	40	C	*	*	*	*	*
Burns	Three Rivers	PGH	07061	BULGER	63	C	*	*	*	*	*
Burns	Three Rivers	PPH	05578	C & D FFR	7	C	*	*	*	*	*
Burns	Andrews	PPH	06109	CASEY FFR	21	C	*	na	*	na	*
Burns	Three Rivers	PGH	05203	CATTERSON F.F.R.	125	C	na	na	na	na	na
Burns	Three Rivers	PPH	05512	CLARKS RIVER	40	C	*	*	*	*	*
Burns	Three Rivers	PGH	05323	CLEMENS F.F.R.	78	C	*	*	*	*	*
Burns	Andrews	PGH	06126	CM OTLEY FFR	173	C	*	*	*	*	*
Burns	Three Rivers	PGH	07054	CRICKET CREEK	40	C	na	na	na	na	na
Burns	Andrews	PGH	06107	CRUMP/CALD FFR	12	C	*	*	*	*	*
Burns	Andrews	PGH	06104	DEFENBAUGH FFR	60	C	*	*	*	*	*
Burns	Three Rivers	PPH	05543	DEVINE FLAT FIELD	118	C	*	*	*	*	*
Burns	Andrews	PGH	06115	DIXON FFR	22	C	*	na	*	na	*
Burns	Three Rivers	PPH	07042	DOLE SMITH	25	C	*	na	*	*	*
Burns	Three Rivers	PPH	05546	DRUIT FIELD	23	C	*	*	*	*	*
Burns	Andrews	PPH	06111	DUNBAR FFR	68	C	*	na	*	na	*
Burns	Three Rivers	PGH	00040	EAST VICKERS FFR	79	C	*	*	*	*	*
Burns	Three Rivers	PGH	05328	FISHER F.F.R.	46	C	*	*	*	*	x
Burns	Three Rivers	PPH	05548	GRIFFIN	56	C	*	*	*	*	*
Burns	Three Rivers	PGH	02249	HAMILTON FFR	20	C	x	*	x	*	x

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Burns	Three Rivers	PGH	05317	HATT BUTTE	103	C	*	*	*	*	*
Burns	Andrews	PGH	06108	HENRICKS FFR	30	C	*	*	*	*	*
Burns	Three Rivers	PGH	04096	HI DESERT	80	C	*	*	*	*	*
Burns	Three Rivers	PPH	07032	HOTCHKISS INDIVIDUAL	26	C	*	*	*	*	*
Burns	Three Rivers	PPH	05554	J FRANCIS MILLER FFR	15	C	*	*	*	*	*
Burns	Three Rivers	PPH	05327	JENKINS B.FLAT F.F.R	280	C	*	*	*	*	*
Burns	Andrews	PPH	06128	KONEK FFR	10	C	*	na	*	na	*
Burns	Andrews	PGH	06127	KUENY RANCH FFR	36	C	*	na	*	na	*
Burns	Three Rivers	PPH	05520	LITTLE UPSON	24	C	*	*	*	*	*
Burns	Three Rivers	PGH	07052	LONE PINE FIELD	6	C	*	*	*	*	*
Burns	Andrews	PPH	06112	LONG HOLLOW FFR	103	C	na	na	na	na	na
Burns	Three Rivers	PGH	05540	LUCE FIELD	13	C	*	*	*	*	x
Burns	Andrews	PPH	06118	LUPHER FFR	21	C	*	*	*	*	*
Burns	Andrews	PGH	06120	MANN LAKE FFR	22	C	*	na	*	na	*
Burns	Three Rivers	PGH	05587	MANNING FIELD	10	C	*	*	*	*	*
Burns	Three Rivers	PGH	05325	Marshall Diamond FFR	54	C	*	*	X	*	*
Burns	Three Rivers	PPH	05542	MARSHALL F.F.R.	13	C	*	*	*	*	*
Burns	Three Rivers	PPH	05567	MILER F.F.R.	16	C	*	*	*	*	*
Burns	Three Rivers	PGH	05552	MILLER F.F.R. A	20	C	*	*	*	*	*
Burns	Three Rivers	PPH	05574	MUDDY CREEK FFR	25	C	*	*	*	*	*
Burns	Three Rivers	PPH	05518	NEWELL FIELD	155	C	*	*	*	*	*
Burns	Andrews	PGH	06116	NORTHRUP FFR	40	C	*	na	*	na	*
Burns	Andrews	PGH	06102	OREGON END FFR	138	C	*	na	*	na	*
Burns	Andrews	PGH	06106	ORLANDO FFR	320	C	*	na	*	na	*
Burns	Andrews	PGH	06133	OTLEY BROS. FFR	24	C	*	na	*	na	*
Burns	Three Rivers	PGH	05555	OTT F.F.R.	5	C	*	*	*	*	*
Burns	Three Rivers	PGH	07047	PEABODY	36	C	*	*	*	*	*
Burns	Three Rivers	PPH	05556	PINE CRK. F.F.R.	180	C	*	*	*	*	*
Burns	Andrews	PGH	06119	POLLOCK FFR	19	C	*	na	*	na	*
Burns	Three Rivers	PGH	05602	QUIER F.F.R.	5	C	*	*	*	*	*
Burns	Three Rivers	PGH	05588	REED F.F.R.	18	C	*	*	*	*	*
Burns	Three Rivers	PPH	05570	RIVER F.F.R.	60	C	*	*	*	*	*
Burns	Andrews	PGH	06125	ROARING SPRINGS FFR	374	C	*	*	*	*	*

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Burns	Andrews	PGH	06114	ROCK CREEK FFR	148	C	*	na	*	na	*
Burns	Andrews	PPH	00508	ROCK CREEK RANCH	9	C	*	*	*	*	*
Burns	Three Rivers	PPH	07034	SCAT FIELD	96	C	*	*	*	*	*
Burns	Andrews	PGH	06130	SCHARFF FFR	68	C	*	*	*	*	*
Burns	Three Rivers	PGH	07005	SECOND FLAT FFR	55	C	*	xl	*	*	*
Burns	Three Rivers	PGH	05590	SMITH F.F.R.	15	C	*	*	*	*	*
Burns	Andrews	PGH	06131	SOUTH POCKET FFR	11	C	*	na	*	na	*
Burns	Three Rivers	PGH	07029	SPRING CREEK	51	C	*	*	*	*	*
Burns	Andrews	PPH	06122	STARR FFR	9	C	*	na	*	na	*
Burns	Andrews	PGH	06110	STILL FFR	68	C	*	na	*	na	*
Burns	Three Rivers	PPH	05206	STOCKADE F.F.R.	63	C	*	x	*	x	x
Burns	Three Rivers	PPH	05545	SUNSHINE FIELD	53	C	*	*	*	*	*
Burns	Three Rivers	PPH	05559	SWORD'S F.F.R.	32	C	*	*	*	*	*
Burns	Three Rivers	PGH	05589	TEMPLE'S F.F.R.	28	C	*	*	*	*	*
Burns	Three Rivers	PGH	05217	THOMPSON F.F.R.	77	C	*	*	*	*	*
Burns	Three Rivers	PGH	07048	VARIEN CANYON	14	C	*	*	*	*	*
Burns	Three Rivers	PGH	05539	W. & C. BLAYLOCK FR	30	C	*	*	*	*	x
Burns	Andrews	PGH	06101	WALDKIRCH FFR	12	C	*	*	*	*	*
Burns	Three Rivers	PGH	04138	WHITE	10	C	na	na	na	na	na
Burns	Three Rivers	PGH	07045	WHITING	48	C	*	*	*	*	*
Burns	Andrews	PGH	06103	WILEY FFR	9	C	*	na	*	na	*
Burns	Andrews	PGH	06124	WINDMILL FFR	15	C	*	na	*	na	*
Burns	Andrews	PGH	06105	WRENCH RANCH FFR	51	C	*	*	*	*	*
Burns	Three Rivers	PGH	07013	ZOGLMANN	160	C	na	na	na	na	na
Burns	Andrews	PPH	06038	ALVORD PEAK ALLOT.	628	C	*	na	*	na	*
Burns	Three Rivers	PPH	05557	J&G KANE F.F.R.	5	C	*	*	*	*	*
Burns	Three Rivers	PGH	05584	POISON CREEK	248	C	*	na	*	na	*
Lakeview	Lakeview	PGH	00600	BEATY BUTTE	26121	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00514	CORN LAKE	2663	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00509	COX BUTTE	1196	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00517	COYOTE-COLVIN	5091	I	*	*	*	*	*
Lakeview	Lakeview	PGH	10102	CRACK-IN-THE-GROUND	298	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00204	CRUMP INDIVIDUAL	92	I	*	*	*	*	*

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Lakeview	Lakeview	PGH	00519	FISH CREEK	575	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00426	FIVE MILE BUTTE	1021	I	*	*	*	*	*
Lakeview	Lakeview	PPH	00206	LANE PLAN II	450	I	*	*	*	*	*
Lakeview	Lakeview	PGH	01000	LITTLE JUNIPER SPRINGS	5417	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00520	LYNCH-FLYNN	881	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00710	MURDOCK	403	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00512	NORTH BLUE JOINT	289	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00511	NORTHEAST WARNER	6152	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00705	OATMAN FLAT	2082	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00216	O'KEEFFE INDIVIDUAL	4808	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00510	ORIJANA RIM	1423	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00212	RAHILLY-GRAVELLY	1781	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00435	SHALE ROCK	1220	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00428	SHEEPROCK	3967	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00700	SILVER-BRIDGE CREEK	303	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00711	SOUTH HAYES BUTTE	88	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00201	VINYARD INDIVIDUAL	460	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00523	WARNER LAKES	1114	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00427	XL	4220	I	x	*	x	*	*
Lakeview	Lakeview	PGH	10103	ZX-CHRISTMAS LAKE	31069	I	*	*	*	*	*
Lakeview	Lakeview	PGH	00522	ABERT SEEDING	2619	M	*	*	*	*	*
Lakeview	Lakeview	PGH	01001	ALKALI WINTER	6223	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00903	BEASLEY LAKE	232	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00712	BRIDGE WELL SEEDING	188	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00213	BURRO SPRING	279	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00909	BUTTON SPRING	1068	M	*	*	*	*	*
Lakeview	Lakeview	PPH	00214	CHUKAR SPRING	52	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00902	CINDER BUTTE	891	M	*	*	x	*	x
Lakeview	Lakeview	PGH	00518	CLOVER CREEK	435	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00407	CLOVER FLAT	200	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00400	COGLAN HILLS	117	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00432	COLEMAN SEEDING	920	M	x	*	x	*	*
Lakeview	Lakeview	PGH	00908	COUGAR MOUNTAIN	616	M	*	*	x	*	*

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Lakeview	Lakeview	PPH	00217	COX INDIVIDUAL	74	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00709	DEAD INDIAN-DUNCAN	425	M	*	*	*	*	*
Lakeview	Lakeview	PGH	10101	EAST GREEN MOUNTAIN	980	M	*	*	x	*	*
Lakeview	Lakeview	PGH	00433	EAST JUG MOUNTAIN	2236	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00530	EAST RABBIT HILLS	1198	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00420	EGLI RIM	1056	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00412	FIR TIMBER BUTTE	58	M	*	x	*	x	*
Lakeview	Lakeview	PGH	00222	FISHER LAKE	781	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00900	FREMONT	1970	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00205	GREASER DRIFT	356	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00202	HICKEY INDIVIDUAL	519	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00904	HIGHWAY	118	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00215	HILL CAMP	3932	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00910	HOGBACK BUTTE	680	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00905	HOMESTEAD	685	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00515	JUNIPER MOUNTAIN	3621	M	*	xl	*	*	*
Lakeview	Lakeview	PGH	00207	LANE PLAN I	1942	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00431	NARROWS	275	M	*	*	x	*	*
Lakeview	Lakeview	PGH	00531	NORTH RABBIT HILLS	1317	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00906	NORTH WEBSTER	112	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00422	PAISLEY FLAT	585	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00100	PETER CREEK	329	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00521	PRIDAY RESERVOIR	65	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00516	RABBIT BASIN	1846	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00210	RIM	39	M	*	*	x	*	*
Lakeview	Lakeview	PGH	00421	ROSEBUD	158	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00211	ROUND MOUNTAIN	1102	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00208	SAGEHEN	266	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00218	SANDY SEEDING	600	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00713	SILVER CREEK	200	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00430	SOUTH POVERTY	4202	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00529	SOUTH RABBIT HILLS	1266	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00915	SQUAW BUTTE	1000	M	*	*	*	*	*

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Lakeview	Lakeview	PGH	00418	SQUAW LAKE	834	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00419	ST. PATRICK'S	750	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00707	TUFF BUTTE	536	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00429	TWIN LAKES	2345	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00911	VALLEY	613	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00901	WASTINA	419	M	*	*	*	*	*
Lakeview	Lakeview	PPH	00406	WEST CLOVER FLAT	15	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00914	WEST GREEN MOUNTAIN	1395	M	*	*	*	*	*
Lakeview	Lakeview	PGH	00424	WEST LAKE	600	M	x	*	x	*	*
Lakeview	Lakeview	PGH	00404	WILLOW CREEK	565	M	*	x	*	*	*
Lakeview	Lakeview	PGH	00708	ARROW GAP	135	C	*	*	*	*	*
Lakeview	Lakeview	PGH	01002	BAR 75 RANCH FRF	73	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00200	BLUE CREEK	131	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00219	CAHILL FFR	280	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00502	FRF FITZGERALD	324	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00501	FRF FLYNN	121	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00507	FRF LAIRD	120	C	*	*	*	*	*
Lakeview	Lakeview	PPH	00223	HICKEY FFR	64	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00411	JONES CANYON	13	C	*	*	*	x	*
Lakeview	Lakeview	PGH	00524	LANE INDIVIDUAL	65	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00505	LYNCH	20	C	*	*	*	*	*
Lakeview	Lakeview	PGH	02647	MURPHY FFR	33	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00203	O'KEEFFE	48	C	*	*	*	*	*
Lakeview	Lakeview	PPH	00403	PINE CREEK	18	C	*	*	*	*	*
Lakeview	Lakeview	PGH	06125	ROARING SPRINGS FFR	374	C	*	*	*	*	*
Lakeview	Lakeview	PGH	06114	ROCK CREEK FFR	148	C	*	na	*	na	*
Lakeview	Lakeview	PPH	00508	ROCK CREEK RANCH	9	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00209	SHADLER	57	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00716	SILVER LAKE-LAKEBED	250	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00503	TAYLOR	295	C	*	*	*	*	*
Lakeview	Lakeview	PGH	00410	TIM LONG CREEK	15	C	*	*	*	x	*
Prineville	Brothers/LaPine	PPH	00043	BARNEY BUCK CREEK	242	I	*	x	*	*	*
Prineville	Brothers/LaPine	PPH	05237	BROTHERS NORTH	1112	I	*	*	*	*	xl

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Prineville	Brothers/LaPine	PGH	00025	BUCK CREEK FLAT	271	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00038	CAVE	227	I	*	x	*	*	*
Prineville	Brothers/LaPine	PGH	00009	COLD SPRINGS	4506	I	*	x		x	x
Prineville	Brothers/LaPine	PGH	00044	G.I.	10723	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00003	HAMPTON	7082	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	07007	HAT BUTTE	4418	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	15234	HAUGHTON	5361	I	x	xl*	xl	*	xl
Prineville	Brothers/LaPine	PPH	00019	IBEX BUTTE	910	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00016	INDIAN CREEK	81	I	*	xl	xl	xl	xl
Prineville	Brothers/LaPine	PGH	00020	LOWER 12 MILE TABLE	684	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	15235	MOFFITT	2300	I	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	05245	RAM LAKE	812	I	*	xl	xl	*	xl
Prineville	Brothers/LaPine	PGH	07063	ROUNDTOP BUTTE	3092	I	*	*	*	*	*
Prineville	Upper Deschutes	PGH	05140	SALT CREEK	2728	I	x	x	x	*	x
Prineville	Brothers/LaPine	PGH	00024	UPPER BUCK CREEK	789	I	*	xl	*	*	*
Prineville	Brothers/LaPine	PPH	00027	UPPER POCKET COMMUNITY	274	I	*	*	*	*	x
Prineville	Brothers/LaPine	PGH	05231	WEST BUTTE	1949	I	x	x	x	*	x
Prineville	Brothers/LaPine	PGH	15238	ZX	7100	I	*	*	*	*	*
Prineville	Brothers/LaPine	PPH	00054	BEAVER CREEK	82	M	*	na	xl	na	xl
Prineville	Brothers/LaPine	PPH	00033	CONGLETON	197	M	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00056	DAGUS LAKE	487	M	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00059	DRY LAKE	33	M	*	*	*	*	*
Prineville	Upper Deschutes	PGH	15228	DUNHAM SOUTH	163	M	xl	xl	xl	na	xl
Prineville	Brothers/LaPine	PPH	05239	GRASSY BUTTE	6036	M	*	*	*	*	*
Prineville	Brothers/LaPine	PPH	00026	HUMPHREY	635	M	*	xl	xl	xl	xl
Prineville	Brothers/LaPine	PPH	00034	LOWER POCKET COMMUNI	160	M	*	*	*	*	xl
Prineville	Brothers/LaPine	PPH	00039	PAULINA	55	M	xl	*	*	*	*
Prineville	Brothers/LaPine	PGH	05211	PINE MTN.	320	M	*	*	*	*	x
Prineville	Brothers/LaPine	PPH	02539	BIGGS	14	C	n/a	n/a	n/a	n/a	n/a
Prineville	Brothers/LaPine	PPH	00073	BIRDSONG BUTTE	15	C	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00017	BONNIEVIEW	28	C	xl	xl	xl	xl	xl
Prineville	Brothers/LaPine	PGH	00066	BUTLER	13	C	xl	na	xl	na	xl
Prineville	Brothers/LaPine	PGH	00028	FERRIAN	15	C	xl	na	xl	na	xl

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Prineville	Brothers/LaPine	PPH	00028	FERRIAN	15	C	xl	na	xl	na	xl
Prineville	Brothers/LaPine	PGH	00037	FOSTER ALLOT	7	C	na	na	na	na	na
Prineville	Brothers/LaPine	PPH	52	MILLER	22	C	*	*	*	*	*
Prineville	Brothers/LaPine	PGH	00049	MCCULLOUGH	10	C	*	xl	*	xl	xl
Prineville	Brothers/LaPine	PGH	05248	POTHOOK	122	C	na	na	na	na	na
Prineville	Brothers/LaPine	PPH	00012	WINDMILL	140	C	xl	xl	xl	na	xl
Vale	Southeastern Oregon	PGH	06012	ALVORD ALLOTMENT	7355	I	*	*	*	*	*
Vale	Baker	PGH	15201	BRANNON GULCH	195	I	na	na	na	na	na
Vale	Baker	PGH	15209	CAMP CREEK	140	I	*	*	*	*	*
Vale	Southeastern Oregon	PGH	00519	FISH CREEK	575	I	*	*	*	*	*
Vale	Baker	PGH	01318	MORMON BASIN	857	I	*	*	*	*	*
Vale	Southeastern Oregon	PGH	06011	POLLOCK ALLOTMENT	4107	I	*	*	*	*	*
Vale	Southeastern Oregon	PGH	05530	RIVER	1649	I	*	xl	*	xl	xl
Vale	Baker	PGH	03026	SODA CREEK	930	I	*	*	*	*	*
Vale	Baker	PGH	11301	SOUTH BRIDGEPORT	928	I	*	xl	*	xl	x
Vale	Baker	PGH	03014	TIMBER CANYON	526	I	*	*	*	*	*
Vale	Baker	PPH	03014	TIMBER CANYON	526	I	*	*	*	*	*
Vale	Southeastern Oregon	PGH	06015	TROUT CREEK MOUNTAIN	8352	I	*	*	*	*	*
Vale	Southeastern Oregon	PPH	06015	TROUT CREEK MOUNTAIN	8352	I	*	*	*	*	*
Vale	Southeastern Oregon	PGH	05523	TUB SPRINGS-HART	1002	I	*	*	*	*	x
Vale	Southeastern Oregon	PPH	05523	TUB SPRINGS-HART	1002	I	*	*	*	*	x
Vale	Southeastern Oregon	PGH	06018	TULE SPRINGS	5504	I	*	n/a	*	n/a	*
Vale	Southeastern Oregon	PGH	05594	VENATOR	320	I	*	*	*	*	*
Vale	Southeastern Oregon	PPH	05594	VENATOR	320	I	*	*	*	*	*
Vale	Southeastern Oregon	PPH	05522	COTTONWOOD CREEK	996	M	*	xl	*	xl	xl
Vale	Baker	PGH	03015	DALY CREEK	160	M	*	xl	*	*	*
Vale	Southeastern Oregon	PGH	05527	RIVERSIDE F.F.R.	49	M	*	*	*	*	*
Vale	Baker	PGH	03003	RUTH GULCH	662	M	*	*	*	*	*
Vale	Baker	PPH	10155	AMELIA BUTTE	24	C	*	*	*	*	*
Vale	Baker	PGH	05210	BEAVERDAM CREEK	3	C	*	*	*	*	*
Vale	Baker	PGH	15203	BIG CREEK	8	C	*	*	*	*	*
Vale	Baker	PGH	01326	BRINKER CREEK	5	C	*	*	*	*	*
Vale	Baker	PGH	15202	BROWN ROCKS	134	C	*	*	*	*	*

DISTRICT NAME	RMP	BLM GRSG Habitat	ALLOTMENT NUMBER	ALLOTMENT NAME	TOTAL ALLOTMENT AUMS	Allotment Management Category	Standard 1: Upland	Standard 2: Riparian	Standard 3: Ecological	Standard 4: Water Quality	Standard 5: Native, Threatened and Endangered
Vale	Baker	PGH	05233	BULLRUN	4	C	*	*	*	*	*
Vale	Baker	PGH	03016	BURNSIDE	36	C	*	*	*	*	*
Vale	Baker	PGH	15208	CAMP DITCH	8	C	*	*	*	*	*
Vale	Baker	PPH	03027	CANYON CREEK	4	C	*	*	*	*	*
Vale	Baker	PGH	05227	COPPER CREEK	28	C	*	*	*	*	*
Vale	Baker	PGH	15214	CORNET CREEK (USFS)	24	C	*	*	*	*	*
Vale	Baker	PGH	05236	COTTONWOOD CREEK	32	C	*	*	*	*	*
Vale	Baker	PGH	05226	COW CREEK	12	C	*	*	*	*	*
Vale	Baker	PGH	03037	DALY CREEK INDIVIDUAL	70	C	*	*	*	*	*
Vale	Baker	PGH	03019	DEER GULCH	3	C	*	*	*	*	*
Vale	Southeastern Oregon	PPH	06104	DEFENBAUGH FFR	60	C	*	*	*	*	*
Vale	Baker	PGH	01329	DEVILS CANYON	60	C	*	*	*	*	*
Vale	Baker	PPH	00146	ELDORADO CREEK	36	C	*	*	*	*	*
Vale	Baker	PGH	15217	ELMS RESERVIOR	12	C	*	*	*	*	*
Vale	Baker	PGH	15204	HAWRY FLAT	54	C	*	*	*	*	*
Vale	Baker	PGH	15207	HEREFORD VALLEY	8	C	*	*	*	*	*
Vale	Baker	PPH	03024	HORSESHOE	10	C	*	*	*	*	*
Vale	Baker	PGH	05225	JOB CREEK	7	C	*	*	*	*	*
Vale	Baker	PGH	15218	JUNCTION	112	C	*	*	*	*	*
Vale	Baker	PPH	03028	KEYSTONE MINE	30	C	*	*	*	*	*
Vale	Baker	PGH	15211	KING MOUNTAIN	28	C	xl	*	xl	*	*
Vale	Baker	PGH	05337	KOONTZ CREEK	4	C	*	*	*	*	*
Vale	Baker	PGH	05342	LOG CREEK	16	C	*	*	*	*	*
Vale	Baker	PGH	03033	LOOKOUT MOUNTAIN	12	C	*	*	*	*	*
Vale	Baker	PPH	03030	LOWER TIMBER CANYON	18	C	*	*	*	*	*
Vale	Baker	PPH	03025	MAIDEN GULCH	32	C	*	*	*	*	*
Vale	Baker	PPH	00118	MALHEUR RESERVOIR	75	C	*	*	*	*	*
Vale	Baker	PGH	01327	MEYER GULCH	17	C	*	*	*	*	*
Vale	Baker	PGH	05235	NORTH FORK BURNT RIVER	40	C	xl	*	xl	*	*
Vale	Baker	PGH	15205	NORTH HEREFORD	35	C	*	*	*	*	*
Vale	Southeastern Oregon	PGH	05555	OTT F.F.R.	5	C	*	*	*	*	*
Vale	Baker	PGH	05234	REED CREEK	34	C	*	*	*	*	*
Vale	Baker	PGH	15219	RIPLEY GULCH	32	C	*	*	*	*	*

DISTRICT NAME	RMP	BLM GRSG Habitat	ALLOTMENT NUMBER	ALLOTMENT NAME	TOTAL ALLOTMENT AUMS	Allotment Management Category	Standard 1: Upland	Standard 2: Riparian	Standard 3: Ecological	Standard 4: Water Quality	Standard 5: Native,Threatened and Endangered
Vale	Baker	PGH	05133	RIVERDALE HILL	13	C	*	*	*	*	*
Vale	Baker	PGH	15212	ROCK CREEK	10	C	*	*	*	*	*
Vale	Southeastern Oregon	PPH	00154	SHASTA BUTTE	24	C	*	*	*	*	*
Vale	Baker	PGH	03017	SHEEP MOUNTAIN	10	C	*	*	*	*	*
Vale	Baker	PGH	05238	SHORT CREEK	8	C	*	*	*	*	*
Vale	Baker	PGH	15322	STACK CREEK	5	C	*	*	*	*	*
Vale	Southeastern Oregon	PPH	05206	STOCKADE F.F.R.	63	C	*	x	*	x	x
Vale	Baker	PGH	05228	SUNFLOWER FLAT	16	C	*	*	*	*	*
Vale	Baker	PPH	05080	THIEF VALLEY	18	C	*	*	*	*	*
Vale	Baker	PGH	15325	TOWNE GULCH	32	C	*	*	*	*	*
Vale	Baker	PPH	03031	UPPER DRY GULCH	35	C	*	*	*	*	*
Vale	Southeastern Oregon	PGH	05539	W. & C. BLAYLOCK FR	30	C	*	*	*	*	x
Vale	Baker	PGH	15323	WENDT BUTTE	84	C	*	*	*	*	*
Vale	Baker	PGH	05220	WHITTED DITCH	8	C	*	*	*	*	*
Vale	Southeastern Oregon	PPH	06105	WRENCH RANCH FFR	51	C	*	*	*	*	*

Notes

The information presented is for BLM owned land only.

This spreadsheet includes Priority, General, and areas of no habitat. If the record is blank for habitat, then this area is outside of Priority or General.

"Std" is Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public lands administered by the Bureau of Land Management in the States of Oregon and Washington, August 12, 1997.

Standard

* = met

x = not met

xl = not met livestock reason

na = assessment not completed

Selective Management Category:

I = Improve category allotments are managd to resolve high-level resource conflicts and concerns and receive highest priority for funding and management actions

M = Maintain category allotments are managed to maintain curretly satisfactory resource conditons and will be actively managed to ensure that resource values do not decline

C = Custodial allotments are manged custodial to protect resource values

Appendix O

Mineral Resources from Baseline Environmental Report

APPENDIX O
MINERAL RESOURCES FROM BASELINE ENVIRONMENTAL REPORT

Table O-1
Acres Open and Closed to Oil and Gas Leasing within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Acres Closed to Oil and Gas Leasing			Acres Open to Oil and Gas Leasing		
		Total	Within PGH	Within PPH	Total	Within PGH	Within PPH
BLM	IV	0	0	0	3,990,600	1,878,400	2,112,200
	V	1,400	400	1,100	6,011,500	3,717,500	2,294,000
	VI	0	0	0	0	0	0
Forest Service	IV	0	0	0	0	0	0
	V	0	0	0	0	0	0
	VI	0	0	0	0	0	0
Tribal and Other Federal	IV	0	0	0	0	0	0
	V	0	0	0	0	0	0
	VI	0	0	0	0	0	0

Table O-1
Acres Open and Closed to Oil and Gas Leasing within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Acres Closed to Oil and Gas Leasing			Acres Open to Oil and Gas Leasing		
		Total	Within PGH	Within PPH	Total	Within PGH	Within PPH
Private	IV	0	0	0	0	0	0
	V	200	0	200	0	0	0
	VI	0	0	0	0	0	0
State	IV	0	0	0	0	0	0
	V	700	700	0	0	0	0
	VI	0	0	0	0	0	0
Other	IV	0	0	0	0	0	0
	V	0	0	0	0	0	0
	VI	0	0	0	0	0	0

Source: Manier et al. 2013
[1]Assumes footprint of 9.4 meters

Table O-2
Acres of Oil and Gas Leases within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres	Acres within PGH	Acres within PPH
BLM	IV	34,700	32,700	2,000
	V	0	0	0
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	900	900	0
	V	0	0	0
	VI	0	0	0
Private	IV	6,900	5,900	1,000
	V	0	0	0
	VI	0	0	0
State	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013

Table O-3
Acres of Oil and Gas Leases Held by Production within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres of Oil and Gas Leases Held by Production	Acres within PGH	Acres within PPH
BLM	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Private	IV	0	0	0
	V	0	0	0
	VI	0	0	0
State	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013

Table O-4
Acres of Oil and Gas Wells within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres[1]	Acres within PGH	Acres within PPH
BLM	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Private	IV	0	0	0
	V	0	0	0
	VI	0	0	0
State	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013
[1]Assumes footprint of 62 square meters per well

Table O-5
Acres of Geothermal Resource Potential within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres with Geothermal Resource Potential[1]	Acres within PGH	Acres within PPH
BLM	IV	3,990,600	1,878,400	2,112,200
	V	6,013,000	3,717,900	2,295,100
	VI	0	0	0
Forest Service	IV	32,400	7,900	24,500
	V	143,700	106,600	37,100
	VI	0	0	0
Tribal and Other Federal	IV	60,100	33,200	26,900
	V	313,400	66,000	247,400
	VI	0	0	0
Private	IV	1,230,500	598,100	632,400
	V	1,743,200	1,121,300	621,900
	VI	0	0	0
State	IV	372,900	273,400	99,500
	V	164,000	110,200	53,800
	VI	0	0	0
Other	IV	3,800	3,800	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013
[1]Derived from areas identified by Idaho National Engineering and Environmental Laboratory as favorable for the discovery and shallow depth of thermal water of sufficient temperature for direct-heat applications

Table O-6
Acres of Geothermal Leases within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres	Acres within PGH	Acres within PPH
BLM	IV	4,700	4,700	0
	V	40,600	30,600	10,000
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	100	100	0
	V	0	0	0
	VI	0	0	0
Private	IV	0	0	0
	V	800	500	300
	VI	0	0	0
State	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013

Table O-7
Acres of Non-Energy Leasable Mineral Permits within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres	Acres within PGH	Acres within PPH
BLM	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Private	IV	0	0	0
	V	0	0	0
	VI	0	0	0
State	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013

Table O-8
Acres of Locatable Mineral Claims within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres	Acres within PGH	Acres within PPH
BLM	IV	3,900	1,600	2,300
	V	7,100	6,300	800
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Private	IV	1,000	600	400
	V	100	100	0
	VI	0	0	0
State	VI	500	500	0
	V	0	0	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013

Table O-9
Acres of Mineral Material Disposal Sites within Sage-Grouse Habitat in the Planning Area

Surface Management Agency	Management Zone	Total Acres	Acres within PGH	Acres within PPH
BLM	IV	78,000	4,000	74,000
	V	10,000	8,600	1,400
	VI	0	0	0
Forest Service	IV	0	0	0
	V	0	0	0
	VI	0	0	0
Tribal and Other Federal	IV	0	0	0
	V	100	100	0
	VI	0	0	0
Private	IV	1,900	600	1,300
	V	1,100	800	300
	VI	0	0	0
State	IV	900	800	100
	V	100	100	0
	VI	0	0	0
Other	IV	0	0	0
	V	0	0	0
	VI	0	0	0

Source: Manier et al. 2013

Appendix P

Detailed Employment and Earnings Data

APPENDIX P
DETAILED EMPLOYMENT AND EARNINGS DATA

Tables P-1 through **P-4** provide employment and earnings data used in the socioeconomic analysis of this report.

Table P-1
Employment Levels by Industry Sector and County in 2010[1,2]

	Baker, OR	Crook, OR	Grant, OR	Harney, OR	Lake, OR	Malheur, OR	Union, OR	Deschutes, OR[3]
Farm	920	823	491	738	628	2,119	1,050	1,629
Forestry, fishing, & related activities[4]	(D)	221	217	161	(D)	(D)	(D)	782
Mining (including oil and gas)	(D)	47	58	11	(D)	(D)	(D)	229
Utilities	75	(D)	(D)	(D)	(D)	28	(D)	312
Construction	437	528	200	(D)	186	390	716	6,521
Manufacturing	610	834	(D)	(D)	222	1,056	1,204	4,629
Wholesale trade	119	753	59	58	74	774	247	1,851
Retail trade	1,031	751	389	463	419	2,178	1,817	10,850
Transportation and warehousing	263	(D)	(D)	(D)	(D)	494	(D)	1,375
Information	99	58	54	38	(D)	130	151	1,802
Finance and insurance	268	233	107	140	82	395	478	4,550
Real estate and rental and leasing	356	568	(D)	119	199	369	358	7,343
Professional and technical services	326	295	94	(D)	129	387	466	6,289
Management of companies and enterprises	77	99	0	(D)	(D)	(D)	40	356
Administrative and waste services	242	339	138	126	(D)	(D)	359	5,673
Educational services	59	70	(D)	(D)	(D)	80	117	1,447
Health care and social assistance	1,039	719	(D)	(D)	(D)	1,965	1,967	10,876
Arts, entertainment, and recreation	(D)	156	(D)	(D)	49	109	265	3,111
Accommodation and food services	(D)	526	(D)	(D)	254	1,128	970	8,031
Other services, except public administration	559	526	177	201	188	831	735	5,269
Federal government	301	383	319	304	301	319	328	1,463
State government	203	128	117	98	162	1,141	1,380	1,005
Local government	712	693	632	678	549	1,971	1,071	6,414
Categories for which data were not disclosed	1,025	567	898	1,070	682	1,333	1,001	0
Total employment	**8,721**	**9,317**	**3,950**	**4,205**	**4,124**	**17,197**	**14,720**	**91,807**

Source: U.S. Department of Commerce. 2012. Bureau of Economic Analysis, Regional Economic Information System, Local Area Personal Income & Employment. Available at: http://www.bea.gov/regional/index.htm.

[1] (D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
[2] (L) Fewer than 10 jobs, but the estimates for this item are included in the totals.
[3] Deschutes County, Oregon constitutes a "secondary" Socioeconomic Study Area, as documented in the text.
[4] "Related activities" includes hunting and trapping, as well as agricultural services such as custom tillage.

Table P-2
Employment Percentages by Industry Sector and County in 2010[5,6]

	Baker, OR	Crook, OR	Grant, OR	Harney, OR	Lake, OR	Malheur, OR	Union, OR	Deschutes, OR[7]
Farm	10.5%	8.8%	12.4%	17.6%	15.2%	12.3%	7.1%	1.8%
Forestry, fishing, & related activities[8]	(D)	2.4%	5.5%	3.8%	(D)	(D)	(D)	0.9%
Mining (including oil and gas)	(D)	0.5%	1.5%	0.3%	(D)	(D)	(D)	0.2%
Utilities	0.9%	(D)	(D)	(D)	(D)	0.2%	(D)	0.3%
Construction	5.0%	5.7%	5.1%	(D)	4.5%	2.3%	4.9%	7.1%
Manufacturing	7.0%	9.0%	(D)	(D)	5.4%	6.1%	8.2%	5.0%
Wholesale trade	1.4%	8.1%	1.5%	1.4%	1.8%	4.5%	1.7%	2.0%
Retail trade	11.8%	8.1%	9.8%	11.0%	10.2%	12.7%	12.3%	11.8%
Transportation and warehousing	3.0%	(D)	(D)	(D)	(D)	2.9%	(D)	1.5%
Information	1.1%	0.6%	1.4%	0.9%	(D)	0.8%	1.0%	2.0%
Finance and insurance	3.1%	2.5%	2.7%	3.3%	2.0%	2.3%	3.2%	5.0%
Real estate and rental and leasing	4.1%	6.1%	(D)	2.8%	4.8%	2.1%	2.4%	8.0%
Professional and technical services	3.7%	3.2%	2.4%	(D)	3.1%	2.3%	3.2%	6.9%
Management of companies and enterprises	0.9%	1.1%	0.0%	(D)	(D)	(D)	0.3%	0.4%
Administrative and waste services	2.8%	3.6%	3.5%	3.0%	(D)	(D)	2.4%	6.2%
Educational services	0.7%	0.8%	(D)	(D)	(D)	0.5%	0.8%	1.6%
Health care and social assistance	11.9%	7.7%	(D)	(D)	(D)	11.4%	13.4%	11.8%
Arts, entertainment, and recreation	(D)	1.7%	(D)	(D)	1.2%	0.6%	1.8%	3.4%
Accommodation and food services	(D)	5.6%	(D)	(D)	6.2%	6.6%	6.6%	8.7%
Other services, except public administration	6.4%	5.6%	4.5%	4.8%	4.6%	4.8%	5.0%	5.7%
Federal government	3.5%	4.1%	8.1%	7.2%	7.3%	1.9%	2.2%	1.6%
State government	2.3%	1.4%	3.0%	2.3%	3.9%	6.6%	9.4%	1.1%
Local government	8.2%	7.4%	16.0%	16.1%	13.3%	11.5%	7.3%	7.0%
Categories for which data were not disclosed	11.8%	6.1%	22.7%	25.4%	16.5%	7.8%	6.8%	0.0%

Source: U.S. Department of Commerce. 2012. Bureau of Economic Analysis, Regional Economic Information System, Local Area Personal Income & Employment. Available at: http://www.bea.gov/regional/index.htm.

[5] (D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
[6] (L) Fewer than 10 jobs, but the estimates for this item are included in the totals.
[7] Deschutes County, Oregon constitutes a "secondary" Socioeconomic Study Area, as documented in the text.
[8] "Related activities" includes hunting and trapping, as well as agricultural services such as custom tillage.

Table P-3
Labor Income Levels by Industry Sector and County and Non-Labor Income Levels by County in 2010, presented in 2010 dollars

	Baker, OR	Crook, OR	Grant, OR	Harney, OR	Lake, OR	Malheur, OR	Union, OR	Deschutes, OR[9]
Population	16,089	20,901	7,466	7,409	7,882	31,321	25,758	157,932
Non-labor income ($ millions)[10]	$267	$338	$116	$107	$113	$389	$369	$2,628
Dividends, interest, and rent ($ millions)	$121	$135	$50	$45	$47	$146	$148	$1,398
Personal current transfer receipts ($ millions)[11]	$146	$203	$66	$62	$66	$243	$221	$1,230
Adjustment for residence ($ millions)[12]	$7	$4	$3	$1	-$1	-$115	$6	$11
Contributions for government social insurance ($ millions)[13]	$35	$45	$16	$15	$16	$75	$66	$445
Total personal income by place of residence ($ millions)	$482	$622	$221	$211	$233	$767	$796	$5,757
Earnings by place of work ($ millions)[14]	$243	$325	$117	$119	$137	$569	$487	$3,563
Total earnings by place of work by sector ($ thousands)[15,16]								
Farm	$2,033	-$8,064	-$152	$6,327	$14,527	$38,460	$16,758	-$13,630
Forestry, fishing, & related activities[17]	(D)	$14,021	$5,359	$3,666	(D)	(D)	(D)	$17,949
Mining (including oil and gas)	(D)	$612	(L)	(L)	(D)	(D)	(D)	$5,028
Utilities	$7,336	(D)	(D)	(D)	(D)	$1,610	(D)	$32,869
Construction	$9,926	$20,650	$7,376	(D)	$5,506	$10,830	$24,348	$319,269
Manufacturing	$26,803	$32,752	(D)	(D)	$9,065	$38,608	$60,336	$193,948
Wholesale trade	$3,491	$57,567	$1,724	$1,460	$2,602	$29,620	$10,205	$98,533

[9] Deschutes County, Oregon constitutes a "secondary" Socioeconomic Study Area, as documented in the text.
[10] Non-labor income includes dividends, interest, and rent and personal current transfer receipts.
[11] Personal current transfer receipts are benefits received by persons for which no current services are performed. They are payments by government and business to individuals and institutions, such as retirement and disability insurance benefits.
[12] Residence adjustment represents the net inflow of the earnings of inter-area commuters. A positive number indicates that, on balance, area residents commute outside to find jobs; a negative number indicates that, on balance, people from outside the area commute in to find jobs.
[13] Contributions for government social insurance consist of payments by employers, employees, the self-employed, and other individuals who participate in the following government programs: Old-age, Survivors, and Disability Insurance; Medicare; unemployment insurance; railroad retirement; pension benefit guarantee; veterans' life insurance; publicly-administered workers' compensation; military medical insurance; and temporary disability insurance.
[14] Earnings by place of work differs from total personal income by the exclusion of dividends, interest, and rent, as well as adjustments to account for net transfer payments (e.g., unemployment benefits and Social Security taxes and payments) and the residential adjustment.
[15] (D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
[16] (L) Fewer than $50,000, but the estimates for this item are included in the totals.
[17] "Related activities" includes hunting and trapping, as well as agricultural services such as custom tillage.

Table P-3
Labor Income Levels by Industry Sector and County and Non-Labor Income Levels by County in 2010, presented in 2010 dollars

	Baker, OR	Crook, OR	Grant, OR	Harney, OR	Lake, OR	Malheur, OR	Union, OR	Deschutes, OR[9]
Retail trade	$21,643	$17,560	$8,421	$9,922	$8,768	$59,841	$43,482	$330,064
Transportation and warehousing	$10,924	(D)	(D)	(D)	(D)	$17,353	(D)	$59,510
Information	$3,255	$2,431	$2,125	$1,289	(D)	$3,787	$4,990	$118,435
Finance and insurance	$5,935	$4,428	$3,554	$1,900	$1,670	$12,483	$11,780	$163,553
Real estate and rental and leasing	$4,796	$6,841	(D)	$3,040	$4,242	$5,457	$4,203	$175,200
Professional and technical services	$8,322	$7,253	$1,876	(D)	$4,295	$13,307	$13,699	$296,712
Management of companies and enterprises	$1,344	$4,611	$0	(D)	(D)	(D)	$2,678	$22,311
Administrative and waste services	$3,599	$7,196	$2,376	$1,391	(D)	(D)	$6,931	$155,350
Educational services	$1,026	$1,305	(D)	(D)	(D)	$1,242	$904	$29,039
Health care and social assistance	$34,896	$24,823	(D)	(D)	(D)	$71,192	$75,076	$634,900
Arts, entertainment, and recreation	(D)	$2,063	(D)	(D)	$236	$1,200	$2,149	$52,775
Accommodation and food services	(D)	$9,913	(D)	(D)	$3,220	$19,207	$16,378	$179,668
Other services, except public administration	$14,249	$16,210	$4,528	$4,881	$5,683	$22,640	$17,144	$170,049
Federal government	$23,259	$31,756	$24,420	$23,504	$24,252	$22,647	$24,440	$109,936
State government	$13,384	$7,067	$6,483	$5,675	$9,790	$76,902	$60,038	$55,134
Local government	$31,267	$35,087	$29,788	$31,252	$24,853	$82,453	$45,576	$356,866
Categories for which data were not disclosed	$15,368	$28,859	$19,426	$24,398	$18,324	$40,145	$46,282	$0

Source: U.S. Department of Commerce. 2012. Bureau of Economic Analysis, Regional Economic Information System, Local Area Personal Income & Employment. Available at: http://www.bea.gov/regional/index.htm.

Table P-4
Labor Income Percentages by Industry Sector and County and Non-Labor Income Percentages by County in 2010

	Baker, OR	Crook, OR	Grant, OR	Harney, OR	Lake, OR	Malheur, OR	Union, OR	Deschutes, OR[18]
Population	16,089	20,901	7,466	7,409	7,882	31,321	25,758	157,932
Non-labor income as a proportion of total personal income[19]	55.4%	54.3%	52.6%	50.7%	48.6%	50.7%	46.4%	45.6%
Dividends, interest, and rent as a proportion of total personal income	25.1%	21.6%	22.8%	21.3%	20.2%	19.0%	18.6%	24.3%
Personal current transfer receipts as a proportion of total personal income[20]	30.3%	32.6%	29.8%	29.4%	28.4%	31.7%	27.8%	21.4%
Adjustment for residence as a proportion of total personal income[21]	1.4%	0.7%	1.5%	0.3%	-0.5%	-15.0%	0.7%	0.2%
Contributions for government social insurance as a proportion of total personal income[22]	7.2%	7.2%	7.2%	7.3%	7.0%	9.8%	8.4%	7.7%
Total personal income by place of residence ($ millions)	$482	$622	$221	$211	$233	$767	$796	$5,757
Earnings by place of work ($ millions)[23]	$243	$325	$117	$119	$137	$569	$487	$3,563
Total earnings by place of work by sector[24,25]								
Farm	0.8%	-2.5%	-0.1%	5.3%	10.6%	6.8%	3.4%	-0.4%
Forestry, fishing, & related activities[26]	(D)	4.3%	4.6%	3.1%	(D)	(D)	(D)	0.5%
Mining (including oil and gas)	(D)	0.2%	(L)	(L)	(D)	(D)	(D)	0.1%
Utilities	3.0%	(D)	(D)	(D)	(D)	0.3%	(D)	0.9%

[18] Deschutes County, Oregon constitutes a "secondary" Socioeconomic Study Area, as documented in the text.

[19] Non-labor income includes dividends, interest, and rent and personal current transfer receipts.

[20] Personal current transfer receipts are benefits received by persons for which no current services are performed. They are payments by government and business to individuals and institutions, such as retirement and disability insurance benefits.

[21] Residence adjustment represents the net inflow of the earnings of inter-area commuters. A positive number indicates that, on balance, area residents commute outside to find jobs; a negative number indicates that, on balance, people from outside the area commute in to find jobs.

[22] Contributions for government social insurance consist of payments by employers, employees, the self-employed, and other individuals who participate in the following government programs: Old-age, Survivors, and Disability Insurance; Medicare; unemployment insurance; railroad retirement; pension benefit guarantee; veterans' life insurance; publicly-administered workers' compensation; military medical insurance; and temporary disability insurance.

[23] Earnings by place of work differs from total personal income by the exclusion of dividends, interest, and rent, as well as adjustments to account for net transfer payments (e.g., unemployment benefits and Social Security taxes and payments) and the residential adjustment.

[24] (D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

[25] (L) Fewer than $50,000, but the estimates for this item are included in the totals.

[26] "Related activities" includes hunting and trapping, as well as agricultural services such as custom tillage.

Table P-4
Labor Income Percentages by Industry Sector and County and Non-Labor Income Percentages by County in 2010

	Baker, OR	Crook, OR	Grant, OR	Harney, OR	Lake, OR	Malheur, OR	Union, OR	Deschutes, OR[18]
Construction	4.1%	6.4%	6.3%	(D)	4.0%	1.9%	5.0%	9.0%
Manufacturing	11.0%	10.1%	(D)	(D)	6.6%	6.8%	12.4%	5.4%
Wholesale trade	1.4%	17.7%	1.5%	1.2%	1.9%	5.2%	2.1%	2.8%
Retail trade	8.9%	5.4%	7.2%	8.4%	6.4%	10.5%	8.9%	9.3%
Transportation and warehousing	4.5%	(D)	(D)	(D)	(D)	3.0%	(D)	1.7%
Information	1.3%	0.7%	1.8%	1.1%	(D)	0.7%	1.0%	3.3%
Finance and insurance	2.4%	1.4%	3.0%	1.6%	1.2%	2.2%	2.4%	4.6%
Real estate and rental and leasing	2.0%	2.1%	(D)	2.6%	3.1%	1.0%	0.9%	4.9%
Professional and technical services	3.4%	2.2%	1.6%	(D)	3.1%	2.3%	2.8%	8.3%
Management of companies and enterprises	0.6%	1.4%	0.0%	(D)	(D)	(D)	0.5%	0.6%
Administrative and waste services	1.5%	2.2%	2.0%	1.2%	(D)	(D)	1.4%	4.4%
Educational services	0.4%	0.4%	(D)	(D)	(D)	0.2%	0.2%	0.8%
Health care and social assistance	14.4%	7.6%	(D)	(D)	(D)	12.5%	15.4%	17.8%
Arts, entertainment, and recreation	(D)	0.6%	(D)	(D)	0.2%	0.2%	0.4%	1.5%
Accommodation and food services	(D)	3.1%	(D)	(D)	2.3%	3.4%	3.4%	5.0%
Other services, except public administration	5.9%	5.0%	3.9%	4.1%	4.1%	4.0%	3.5%	4.8%
Federal government	9.6%	9.8%	20.8%	19.8%	17.7%	4.0%	5.0%	3.1%
State government	5.5%	2.2%	5.5%	4.8%	7.1%	13.5%	12.3%	1.5%
Local government	12.9%	10.8%	25.4%	26.3%	18.1%	14.5%	9.4%	10.0%
Categories for which data were not disclosed	6.3%	8.9%	16.6%	20.6%	13.4%	7.1%	9.5%	0.0%

Source: U.S. Department of Commerce. 2012. Bureau of Economic Analysis, Regional Economic Information System, Local Area Personal Income & Employment. Available at: http://www.bea.gov/regional/index.htm.

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Appendix Q

Non-Market Valuation Methods

APPENDIX Q
NON-MARKET VALUATION METHODS

NON-MARKET VALUATION METHODS

This section addresses economic valuation of three categories of non-market resources that are present in the study area and could potentially be affected by the alternatives. These three categories of non-market value are recreation, values of GRSG to households in the intermountain west, and value of the ranching tradition to the ranchers themselves, residents, and visitors to the region. Recreation is included because actions that promote the conservation of GRSG habitat may result in changes in recreation opportunities, such as increasing the amount of habitat for other wildlife species that may be hunted or viewed that depend on public lands, roads open or closed for recreation access, and the quality of the recreation experience.

The economic non-market values described in this appendix are not directly comparable to regional economic indicators commonly used to describe how natural resources on public lands contribute to the regional economic indicators such as output/sales, labor income, and employment. These indicators provide valuable information to the local public as well as to regional government agencies for purposes of public service and infrastructure planning. These impacts or contributions are often referred to as distributional effects as they describe the effects to the region. However, these indicators do not represent net economic value. For example, in economic terms, labor income associated with mineral production would actually be considered a cost to the producer. Similarly, expenditures by a recreation visitor associated with a visit to public lands would be viewed by the recreationist as a cost. One last example would be the total sales generated by the sale of minerals extracted from federally owned minerals: the total sales do not reflect the net economic value since the costs associated with the extraction are not accounted for (including labor income, supplies, and equipment, as well as potentially non-market costs such as those associated with pollution). This section considers the economic value of the non-market outputs, a concept described below.

Total Non-Market Economic Value

Many of the multiple uses in the study area are not bought and sold in competitive markets. For instance, many recreational visitors to public lands pay no or low admission fees, and the presence of wild animals such as GRSG have no "market price," yet both have value to people. In some cases people gain value from using these non-market resources, such as recreation on public lands; in other cases, protection of some natural resources provides both a use value (e.g., wildlife viewing) as well as a non-use value (e.g., the value some people hold for knowing that a specific natural resource exists and is protected even if they never intend to "use" or visit it).

Economists call the sum of these two values Total Economic Value. Use values typically can be consumptive use (e.g., hunting) and/or non-consumptive, such as viewing or being present on site (e.g., camping and hiking). In contrast, non-use values occur off-site to people who derive enjoyment from knowing a natural environment, habitat or species exists in its natural state, either for themselves (existence value) and/or future generations (bequest value). Krutilla (1967) documents the conceptual origins of these two elements of non-use value, and Freeman (2003) provides a rigorous theoretical treatment.

Non-use or existence values can potentially be enjoyed by millions if the good or service (e.g., the presence of a specific wild species such as wild salmon or rare bird species) is of widespread interest. Thus, while the non-use value per household may much lower than a value per day received by a visitor, in total, non-use values may be quite large.

Recreation Values

Economists measure the net economic use and non-use values as "Consumer Surplus." At its most basic level, consumer surplus is the maximum amount a person would pay minus the amount they actually have to pay. Consumer surplus, which is also sometimes referred to as "net willingness to pay," is a measure of benefit has been used by economists and federal agencies for decades (US Water Resources Council 1983; US Environmental Protection Agency 2009, 2010).

For public land recreation, especially on BLM recreation sites, entrance fees are typically very low or non-existent, so the value people place on these public land recreation opportunities is not fully measured simply by the entrance fees they pay. In economic terms, there is not a competitive market or a "market clearing price" for access to public recreation sites. Therefore, there can be a substantial difference between what people pay to visit a recreation site (e.g., entrance fees plus travel costs, including the value of time) and the maximum amount they would pay.

A common non-market valuation method used for recreation is the travel cost method. In this method, economists survey visitors to a recreation site and collect data on their frequency of trips, travel distance and costs incurred to

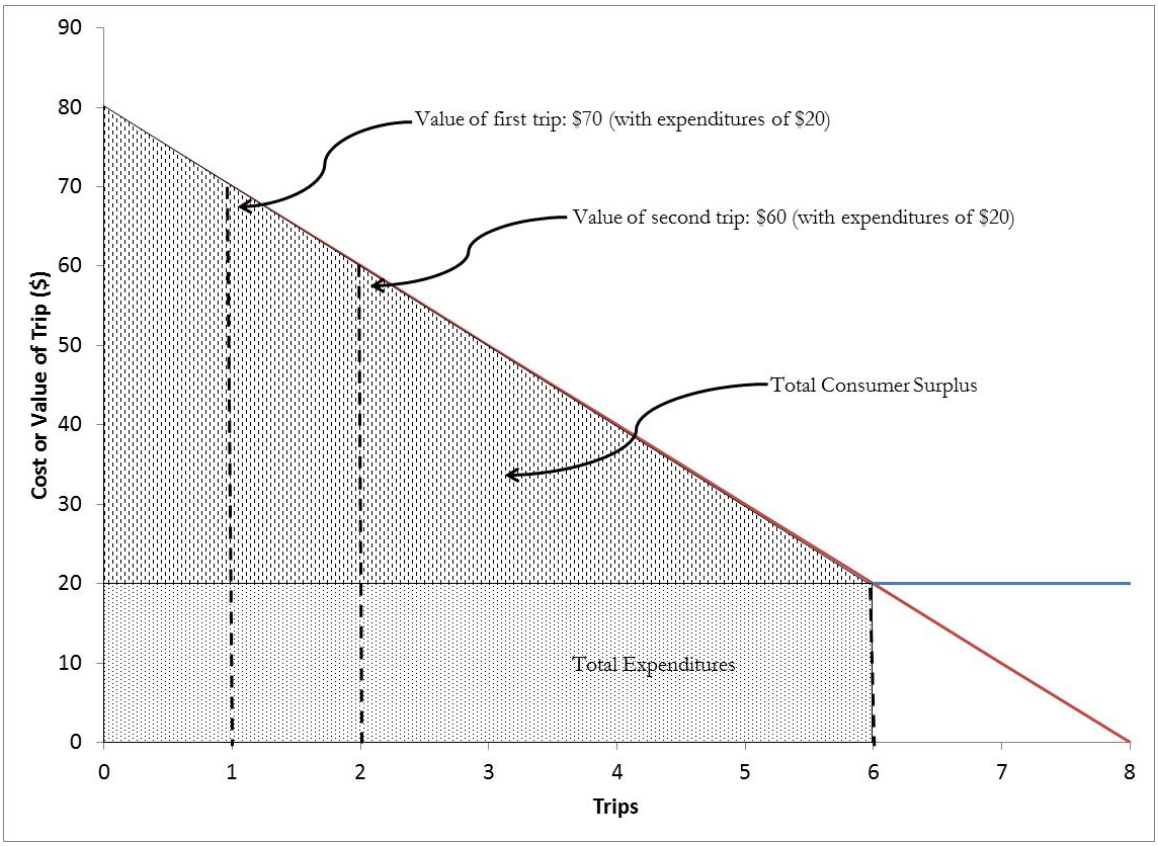
access the site. Because the survey uses information from actual visitors, the travel cost method is a "revealed preference" method of valuation; economists use the travel costs as a proxy to determine the value that people gain from using the site. Variations in the travel cost across visitors, along with their respective number of trips, allow economists to statistically estimate a relationship between travel cost and quantity of trips – an aggregate demand curve for the recreation site, much like a demand curve for goods and services that are sold in competitive markets. This aggregate demand curve will tend to show that individuals with a relatively high travel cost take fewer trips on average, while individuals with a lower cost take more trips on average. From this aggregate demand curve, economists can calculate consumer surplus. Many of the consumer surplus values for recreation in the literature (Loomis 2005) and recently developed by the Forest Service (Bowker et al. 2009) rely upon the travel cost method.

Diagram Q-1, Consumer Demand Curve and Consumer Surplus for Recreation Trips, provides an illustration of a demand curve for recreation on a particular site. In Diagram Q-1, the aggregate demand is shown on an average basis, that is, for an average individual consumer. The downward-sloping diagonal line in Diagram Q-1 represents the relationship between the travel cost and quantity of trips demanded by this average consumer. In the diagram, the value of the first several trips is relatively high ($70 for the first and $60 for the second trip), while the value of the sixth trip is lower ($20 in the diagram). In a travel cost method study, these values are statistically derived from the aggregate demand calculated for the entire population. The downward slope of the demand curve corresponds to declining value associated with each trip, which is typical for most goods and services.[1] It also corresponds to the fact that visitors will take fewer trips to areas with a higher travel cost.

Each visitor receives a net benefit from each trip, which is measured by the difference between what they had to pay and the maximum amount they would pay for each trip. In **Diagram Q-1**, Consumer Demand Curve and Consumer Surplus for Recreation Trips, the net benefit for the average visitor is the difference between their actual expenditures of $20 per trip and the maximum amount they would pay for each trip. As shown, the first trip has a net benefit of $50 ($70 of value less $20 in expenditures), the second trip $40 ($60 less $20), and so on until the sixth trip. At the sixth trip the visitor's cost is the same as their benefit, and hence there is no net benefit from further trips. Thus, this gain to the visitor over and above what they spend is their "consumer surplus."

[1] Note that for some types of recreation use, users may gain increased value over a portion of the number of trips; for example, mountain bikers may experience increased enjoyment of subsequent trips to a single location as their trail-specific skills and knowledge increase with repeat visits. Climbers and other users may also experience similar gains over repeat visits. However, even these users will likely hit a point where the marginal value begins to decrease with more trips.

Diagram Q-1. Consumer Demand Curve and Consumer Surplus for Recreation Trips



Given the large range and diversity of sites in the study area, the BLM did not perform original travel cost method analysis of visitation in the study area. Rather, they relied upon transferring existing recreation values from travel cost method studies such as Bowker et al. (2009) and other recreation values from the existing literature (Loomis 2005; Loomis and Richardson 2007; USFWS 2009) to the recreation activities in the study area, focusing on existing studies in the Pacific Northwest region (Oregon and Washington). This approach, known as "Benefit Transfer," is well-developed in academic and policy literature and has been used by federal agencies including the US Environmental Protection Agency (see Griffiths et al. 2012 for a recent listing of economic studies where benefit transfer was used), US Army Corps of Engineers, US Bureau of Reclamation, Forest Service (Forest Service 1991; also see Ervin et al. 2012 for a recent application of benefit transfer to the Mount Hood National Forest), and other agencies. Benefit transfer is widely used in academic applications as well; see Wilson and Hoehn (2006) for a series of journal articles on benefit transfer.

The BLM measures recreation activity in various units, including a "visitor hour," which represents the presence of one or more persons in an area for continuous or simultaneous periods of time aggregating 1 hour (i.e., one person for 1 hour or two persons for 30 minutes each). A "visitor day" as defined by

BLM represents 12 visitor hours (BLM 2003). The BLM Recreation Management Information System provides data on recreation visitor days (RVDs); to be compatible with these units, BLM identified non-market values for various recreation activities in units of dollars per RVD. Values from economic literature, based on primary research conducted on various recreation sites, were matched to BLM recreation activity classifications. **Table Q-1**, Consumer Surplus for Recreation Activities, provides a listing of the values per day representing Oregon.

Table Q-1
Consumer Surplus for Recreation Activities

Recreation Activity Category	Consumer Surplus per Visitor Day (2012 dollars)
Backpacking	31.41
Camping	67.02
Cross Country Skiing	58.80
Fishing	55.00
Floatboating/Rafting/Canoeing	33.84
General Recreation	46.07
Hiking	52.74
Hunting	90.54
Motorboating	32.74
Mountain Biking	64.36
Off-Road Vehicle Driving/Off-Highway Vehicle	57.51
Other Recreation	46.62
Picnicking	25.83
Pleasure Driving	29.26
Rock Climbing	61.32
Sightseeing	30.71
Snowmobiling	50.33
Swimming	33.17
Waterskiing	69.23
Wildlife Viewing	52.00

Sources: Rosenberger 2012; Loomis 2005; Loomis and Richardson 2007; Bowker et al., 2009; USFWS 2009.

Consistent with the description above of consumer surplus and the travel cost method, readers should interpret the values in **Table Q-1**, Consumer Surplus for Recreation Activities, as the consumer surplus or the amount of value that the average visitor derives from a full day of recreation beyond their actual expenditures. Thus, a typical off-highway vehicle user would pay an average value of $57.51 more than their trip cost to have the opportunity to participate in a typical day of driving off-road vehicles.

Table Q-2, Total Consumer Surplus for Recreation in Oregon Sub-Region, shows the total consumer surplus associated with recreation activities on BLM-administered lands for the Oregon sub-region, including the BLM Resource

Areas of Andrews, Baker, Central Oregon, Jordan, Klamath Falls, Lakeview, Malheur, and Three Rivers, as well as the Steens Mountain Cooperative Management and Protection Area (CMPA). RVDs on BLM lands presented in **Table Q-2**, Total Consumer Surplus for Recreation in Oregon Sub-Region, are calculated directly from Report 26 from the BLM RMIS (Report 26 provides RVDs based on recorded visitor hours – defined above – and dividing by twelve). For this analysis, BLM used average RVDs per year over the period 2008 to 2012. Note that conservation measures for GRSG may affect only specific types and fractions of the public lands that contributed to the visitor days used to estimate the surplus values in **Table Q-2**, Total Consumer Surplus for Recreation in Oregon Sub-Region.

Table Q-2
Total Consumer Surplus for Recreation in Oregon Sub-Region

Recreation Activity	Average RVDs Per Year	Total Consumer Surplus (millions of 2012 dollars)
Backpacking	39,124	$1.2
Big Game Hunting	114,650	$10.4
Camping	1,012,548	$67.9
Cross Country Skiing	5,934	$0.3
Fishing	260,383	$14.3
Floatboating/Rafting/Canoeing	31,123	$1.1
General Recreation	81,996	$3.8
Hiking	20,564	$1.1
Hunting – Other	36,204	$3.3
Motorboating	7,707	$0.3
Mountain Biking	103,827	$6.7
Off Road Vehicle Driving/ Off-Highway Vehicle	175,326	$10.1
Other Recreation	88,687	$4.1
Picnicking	70,372	$1.8
Pleasure Driving	12,347	$0.4
Rock Climbing	147,039	$9.0
Sightseeing	55,712	$1.7
Small Game Hunting	3,467	$0.3
Snowmobiling	20,430	$1.0
Swimming	6,292	$0.2
Waterfowl Hunting	12,499	$1.1
Wildlife Viewing	80,082	$4.2
Total	**2,730,629**	**$144.2**

Source: BLM 2012; consumer surplus per RVD shown in **Table Q-1**, Consumer Surplus for Recreation Activities.

To estimate impacts on consumer surplus associated with changes in RVDs, BLM economists worked with BLM recreation specialists to project how RVDs for various activities would change under the alternatives. Because BLM

recreation specialists indicated that RVDs would not differ under the alternatives, no differences in consumer surplus are anticipated.

Values Associated with Greater Sage-Grouse Populations

Economists have long recognized that wildlife species, especially rare, threatened, and endangered species, have economic values beyond just viewing. This is supported by a series of legal decisions and technical analyses. The US Court of Appeals in 1989 first clarified that the US Department of the Interior, in assessing damages in Natural Resource Damage Assessment cases, should include what it termed as "passive use values," that is, existence values provided to non-users of the species, as a compensable value in addition to any use value. These passive use values are also included in Oil Pollution Act damage assessments as well. The term passive values is interchangeable with the term non-use values defined previously. This ruling and subsequent analysis for Natural Resource Damage Assessment and Oil Pollution Act assessments are consistent with well-established economic theory showing that people derive value from passive use or non-use as well as active uses of resources (Krutilla 1967). Economists have devoted a great deal of conceptual and empirical work to refining concepts and developing methods to measure these passive use values.

The dominant methods are "stated preference" methods, of which the most prominent is the Contingent Valuation Method. The basic element of this method is to use a survey to construct or simulate a market or referendum for protection or improvement of a natural environment, habitat, or species, and then having the respondent indicate whether or not they would pay for an increment of protection, and if so, how much they would pay. While the method has developed a great deal of sophistication that has increased the validity of the willingness to pay responses, there is admittedly a degree of bias that can result in stated willingness to pay exceeding actual willingness to pay by a factor averaging two to three (Loomis 2011; Murphy et al. 2005; List and Gallet 2001). While not a perfect estimator of willingness to pay, the Contingent Valuation Method provides a useful means for estimating the public's passive use values.

Numerous academic papers and even entire books have been written on the Contingent Valuation Method. Mitchell and Carson (1989) was one of the first, while Alberini and Kahn (2006) is a more recent treatment. To date there have been about 7,500 Contingent Valuation Method studies in over 130 countries (Carson 2011). A number of federal agencies have used or referenced stated preference methods, including the US Bureau of Reclamation, US Environmental Protection Agency, National Park Service, and state agencies such as the California Department of Fish and Game, Idaho Fish and Game, and Montana Fish, Wildlife, and Parks. The USFWS commissioned an original Contingent Valuation Method study of the economic values the public receives from reintroduction of wolves in the areas of Idaho, Montana, and Wyoming, and

used those values in an EIS on wolf reintroduction (USFWS 1994). The US Bureau of Reclamation, National Park Service, and Lower Elwha S'Klallam Tribe commissioned a Contingent Valuation Method study on the value of removal of the Elwha and Glines Canyon Dams (Meyer et al. 1995). The US Bureau of Reclamation also commissioned an original Contingent Valuation Method study on the values of providing stable river flows to benefit riparian vegetation, endangered species, and cultural resources. That study was cited by then-Secretary of the Interior Bruce Babbitt as a factor in selecting the more protective flow regime from Glen Canyon Dam despite it having more foregone hydroelectricity (Babbitt 1996).

The BLM conducted a literature search to demonstrate the potential range of values that could be associated with species that are candidates for listing as threatened or endangered, such as GRSG populations. Analysts first verified there are no existing studies on Total Economic Value or non-use valuation specific to the GRSG. This is not an uncommon occurrence, as there are dozens of rare or potentially threatened species that have not been valued despite the very high policy relevance of the species and the large magnitude of economic value at stake in these policy decisions.

The BLM used three criteria to identify studies that are most applicable to the current analysis: (1) whether the species valuation study was located in the same geographic region as the GRSG habitat; (2) whether the species was listed or not listed as threatened or endangered; and (3) whether the species was hunted or not (implying a mix of use and non-use values).

The primary database of articles was the recent peer-reviewed journal article by Richardson and Loomis (2009), which is a compilation of the economic values of threatened, endangered, and rare species. A literature review was also conducted to determine if there had been any recent studies on GRSG or closely related species. Unfortunately, there is not a perfect match in the literature in terms of geographic region (intermountain) and a species that is both hunted and rare. **Table Q-3**, Existing Estimates of Annual Total Economic Value of Protecting Habitat for Species Similar to GRSG, provides a summary of the studies with features most similar to the GRSG species.

As can be seen in **Table Q-3**, Existing Estimates of Annual Total Economic Value of Protecting Habitat for Species Similar to GRSG, there is one study with a geographic region overlapping the sub-region (Mexican spotted owl), and one study on a species that was hunted at the time (wild turkey). At the time of the study, the Mexican spotted owl was a threatened species under the Endangered Species Act, and respondents were told in the survey that it was a threatened species. The whooping crane, red-cockaded woodpecker, and peregrine falcon studies involved an endangered species.

Table Q-3
Existing Estimates of Annual Total Economic Value of Protecting Habitat for Species Similar to GRSG

Region	Species	Listed	Hunted	Annual Value per Household[b]	Change Valued
Four Corners (AZ, CO, NM, UT)	Mexican Spotted Owl	Yes	No	$58.49	Avoid extinction in 15 years in Four Corners region
New England	Wild Turkey	No	Yes	$16.72[a]	Avoid extinction in New England
Texas (also L.A., NYC, Chicago, Atlanta)	Whooping Crane	Yes	No	$43.69[a]	Avoid extinction
Maine	Peregrine Falcon	Yes	No	$32.37 (one time)	Restore self-sustaining population
South Carolina & Rest of US	Red-Cockaded Woodpecker	Yes	No	$14.69	Restore habitat to increase chance of survival to 99%

Sources: Loomis and Ekstrand 1997 (Mexican spotted owl); Stevens et al. 1991 (New England wild turkey); Bowker and Stoll 1988 (whooping crane); Kotchen and Reiling 2000 (peregrine falcon); Reaves et al. 1999 (red-cockaded woodpecker). All of these sources are as cited in Richardson and Loomis (2009).
Notes:

a. Average of estimates from the study.
b. As noted in the text, these stated preference values for household may have a degree of hypothetical bias that could overstate the actual monetary amount households would pay by a factor of two to three.

All of these studies used the Contingent Valuation Method in a mail survey. Households were asked whether they would pay a specific dollar amount, with that amount varying across individuals in the sample (i.e., the valuation questions were "closed-ended," although the wild turkey study and red-cockaded woodpecker also used an open-ended valuation question for some respondents). Researchers used the closed-ended valuation questions to generate a statistical valuation function. This valuation function exhibited internal validity: the higher the dollar amount households were asked to pay, the lower the percentage of them that would pay that dollar amount.

With the exception of the peregrine falcon study, which asked respondents to commit to a one-time payment, each survey asked respondents to pay annually to accomplish the stated goal (typically, preventing the species from going extinct in the region of interest, although this varied by study as the table shows). For the peregrine falcon and red-cockaded woodpecker, households were told that their payment would restore a self-sustaining population (i.e., one that would not go extinct).

The original wild turkey study provided an estimate of three values (in 1990 dollars) that were averaged and then adjusted to 2012 dollars using the

Consumer Price Index, resulting in a value of $16.72 per household per year. The same procedure was used to update the 1996 dollar values of the Mexican spotted owl to 2012, resulting in values of $58.49 per household per year. The higher values for the Mexican spotted owl may be due to the large area of habitat (4.6 million acres stated in the survey and shown on a map) that would be protected in the Four Corners area by paying, and the fact the species was not a hunted species. The whooping crane values are fairly large at $43.69 per household per year; this value represents a Total Economic Value, including both use and non-use value, as some of the sample included people who actively "used" the species (as wildlife viewers).

The study values in **Table Q-3**, Existing Estimates of Annual Total Economic Value of Protecting Habitat for Species Similar to GRSG, demonstrate that many people, or segments of the public, hold substantial value for protecting threatened and endangered species, which may carry over to the GRSG. Given that protection is a public good available to all households in the intermountain west, the aggregate or intermountain regional value could be substantial.

Values Associated with Grazing Land

Public lands managed for livestock grazing provides both market values (e.g., forage for livestock) and non-market values. Many ranchers themselves value the ranching lifestyle in excess of the income generated by the ranching operations. This is evident in some ranch sales transaction data which suggests some ranch properties have sold for more than the market value of the public land forage (Bartlett et al. 2002; Taylor 2006). One of the primary reasons public lands ranchers indicate they own land is for the "tradition, values and culture" rather than primarily for profit (Tanaka et al. 2005). Many public land ranchers work elsewhere part-time and rely on the ranch for only 20 percent of their income (Hanus 2011), relying instead on outside jobs or other savings to support their ranching lifestyle. Land appreciation has also provided increased value and therefore served as an economic resource for ranchers (Tanaka et al. 2005; Torell et al. 2005). As several of these authors note, changes in public land grazing that reduce the profitability of grazing may not directly translate to withdrawal from ranching, due to the fact that economic factors are not necessarily the primary motivation for public land ranching.

Some studies have found non-market values of ranching associated with use values to residents (Mangun et al. 2005) and tourists in the form of open space and western ranch scenery (Ellingson et al. 2006). However, some others see non-market opportunity costs associated with livestock grazing that may, depending on management methods and other variables, reduce native plant species and forage for wildlife (Todres et al. 2003). The potential exists for other residents or visitors to prefer lifestyles or have lifestyle needs that are not consistent with grazing or ranching lifestyles or landscapes.

Methods available to measure the use values to residents and tourists associated with grazing land include stated preference methods similar to contingent valuation (Ellingson et al. 2006; Mangun et al. 2005). Methods for attempting to isolate any amenity values that ranchers themselves may hold include the hedonic price method. This method uses observed sale prices of ranch land as a function of the characteristics, including both conventional market factors (e.g., size of ranch and quantity of forage) but also amenity values (e.g., scenic views, presence of wildlife species, and on-site fishing or hunting opportunities) that may be provided by the ranch (Torell et al. 2005). The additional value that ranchers pay for the amenity values of the ranch provide some indication of how much they value these amenities. Using the hedonic price method to estimate a "lifestyle value" separate from the market and amenity values has yet to be done in the literature. This may be due to the fact that lifestyle values attributed to living on a ranch or ranching is present on nearly all ranch properties sold. As such, statistically it is difficult to isolate the contribution of ranching lifestyle to differences in ranch property values as ranching lifestyle is a common feature of nearly all ranch properties sold.

References

Alberini, A., and J. Kahn. 2006. Handbook on Contingent Valuation. Edward Elgar, Northampton, MA.

Babbitt, B. 1996. Record of Decision, Operation of Glen Canyon Dam. Final Environmental Impact Statement. US Department of the Interior, Washington, DC.

Bartlett, T., L. A. Torell, N. Rimbey, L. van Tassell, and D. McCollum. 2002. Valuing Grazing on Public Land. Journal of Range Management 55: 426-438.

BLM (United States Department of the Interior, Bureau of Land Management). 2003. Guidelines to Reporting Recreation Visitation. June 23. US Department of the Interior, Washington, DC.

_____. 2012. Recreation Management Information System. Report 26, Visitor Days and Participants by Office and Activity. US Department of the Interior, Washington, DC.

Bowker, J. M., M. Starbuck, D. English, J. Bergstrom, R. Rosenberger, and D. McCollum. 2009. Estimating the Net Economic Value of National Forest Recreation: An Application of the National Visitor Use Monitoring Data. Faculty Series Working Paper, FS-09-02. Department of Agricultural and Applied Economics, University of Georgia, Athens, GA.

Bowker, J. M., D. B. K. English, and H. K. Cordell. 1999. Projections of Outdoor Recreation Participation to 2050. *In* Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends (ed. H. K. Cordell). Sagamore Publishing.

Bowker, J. M., and J. R. Stoll. 1988. Use of dichotomous choice nonmarket methods to value the whooping crane resource. American Journal of Agricultural Economics 70, 372–381.

Carson, R. 2011. Contingent Valuation: A Comprehensive Bibliography and History. Edward Elgar, Northampton, MA.

Ellingson, L., A. Seidl, and C. J. Mucklow. 2006. Tourists' Value of Routt County's Working Landscape, 2005: Summary Report. EDR 0-07, Economic Development Report, Dept. of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO. Internet Web site: http://dare.colostate.edu/pubs/EDR/EDR06-07.pdf.

Ervin, D., G. Larsen, and C. Shin. 2012. Simple Ecosystem Service Valuation Can Impact National Forest Management, AERE Newsletter 32(1): 17-22. May.

Forest Service (United States Department of Agriculture, Forest Service). 1991. Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program. US Department of Agriculture, Washington, DC.

Freeman, M. 2003. The Measurement of Environmental and Resource Values. Resources for the Future Press, Washington, DC.

Griffiths, C., H. Klemick, M. Massey, C. Moore, S. Newbold, D. Simpson, P. Walsh, and W. Wheeler. 2012. US Environmental Protection Agency Valuation of Surface Water Quality Improvements. Environmental Economics and Policy 6(1): 130-146.

Hanus, A. 2011. Socio-Economic Profile and Analysis of Seven Oregon Counties Included in the Greater Sage-Grouse Conservation Strategy for Oregon. Association of Oregon Counties.

Kotchen, M., and S. Reiling. 2000. Environmental attitudes, motivations, and contingent valuation of nonuse values: a case study involving endangered species. Ecological Economics 32, 93–107.

Krutilla, J. V. 1967. Conservation Reconsidered. American Economic Review 57: 777-786.

List, J., and C. Gallet. 2001. What experimental protocol influences disparities between actual and hypothetical stated values? Environmental and Resource Economics 20: 241–254.

Loomis, J. 2005. Updated Outdoor Recreation Use Values on National Forests and Other Public Lands. General Technical Report PNW-GTR-658. USDA Forest Service Pacific Northwest Research Station, Portland, OR. Internet Web site: http://www.fs.fed.us/pnw/pubs/pnw_gtr658.pdf.

Loomis, J. 2011. What's to Know about Hypothetical Bias in Stated Preference Valuation Studies. Journal of Economic Surveys 25(2): 363-370.

Loomis, J., and E. Ekstrand. 1997. Economic Benefits of Critical Habitat for the Mexican Spotted Owl: A Scope Test Using a Multiple Bounded Contingent Valuation Survey. Journal of Agricultural and Resource Economics 22(2): 356-366.

Loomis, J., and L. Richardson, 2007. Benefit Transfer and Visitor Use Estimating Models of Wildlife Recreation, Species and Habitats. Department of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO. Internet Web site: http://dare.colostate.edu/tools/benefittransfer.aspx.

Mangan, N., A. Seidl, C. J. Mucklow, and D. Alpe. 2005. The Value of Ranchland to Routt County Residents 1995-2005. EDR 05-02, Economic Development Report, Dept. of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO. Internet Web site: http://dare.colostate.edu/pubs/EDR/EDR05-02.pdf.

Meyer, P. A., R. Lichtkoppler, R. B. Hamilton, D. A. Harpman, C. L. Borda, and P. M. Engel. 1995. Elwha River Restoration Project: Economic Analysis, Final Technical Report. Developed by the Project Human Effects Team. A Report to the US Bureau of Reclamation, National Park Service, and Lower Elwha S'Klallam Tribe. Davis, CA. Internet Web site: http://digital.library.ucr.edu/cdri/documents/R264_Economic_analysis.pdf.

Mitchell, R., and R. Carson. 1989. Using Surveys to Value Public Goods: The Contingent Valuation Method. Resources for the Future, Washington DC.

Murphy, J. J., P. G. Allen, T. H. Stevens, and D. Weatherhead. 2005. A meta-analysis of hypothetical bias in stated preference valuation. Environmental and Resource Economics 30: 313-325.

Reaves, D. W., R. Kramer, and T. Holmes. 1999. Does Question Format Matter? Valuing an Endangered Species. Environmental and Resource Economics 14: 365-383.

Richardson, L., and J. Loomis. 2009. The Total Economic Value of Threatened, Endangered and Rare Species: An Updated Meta- Analysis, Ecological Economics 68: 1535-1548.

Rosenberger, R. 2012. Recreation Use Values Database. Downloaded October 13, 2012. Internet Web site: http://recvaluation.forestry.oregonstate.edu/sites/default/ files/RECREATION_USE_VALUES_DATABASE_%20SUMMARY.pdf.

Rosenberger, R., and J. Loomis. 2000. Using Meta-Analysis for Benefit Transfer: In-Sample Convergent Validity Tests of an Outdoor Recreation Database. Water Resources Research, 36(4): 1097-1107.

Stevens, T., J. Echeverria, R. Glass, T. Hager, and T. Moore. 1991. Measuring the Existence Value of Wildlife. Land Economics 67(4): 390-400.

Tanaka, J., L. A. Torell, and N. Rimbey. 2005. Who Are Public Land Ranchers and Why are They Out There? Western Economic Forum: 14-20. Fall 205.

Taylor, T. 2006. Rural Communities and Public Lands in the West: Impacts and Alternatives. University of Wyoming. USDA Research, Education and Economics Information System.

Todres, T., A. Seidl, D. McLeod, A. Bittner, R. Coupal, and K. Inman. 2003. Preferred Public Land Use and Policy in Moffat County: Final Report of Countywide Opinion Survey. APRPR03-11. Agricultural and Resource Policy Report, Dept. of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO. Internet Web site: http://dare.colostate.edu/pubs/ARPR/ ARPR%2003-11.pdf.

Torrell, L. A., N. Rimbey, O. Ramirez, and D. McCollum. 2005. Income Earning Potential versus Consumptive Amenities in Determining Ranchland Values. Journal of Agricultural and Resource Economics 30(3): 537-560.

US Court of Appeals, DC Circuit. 1989. State of Ohio v. US Department of Interior (880 F.2d. 432).

US Environmental Protection Agency. 2000. Guidelines for Preparing Economic Analyses. EPA 240-R-00-003. Washington, DC.

_____. 2009. Valuing the Protection of Ecological Systems and Services. EPA-SAB-09-012. Washington, DC.

_____. 2010. Guidelines for Preparing Economic Analyses. EPA 240-R-10-001. Washington, DC.

USFWS (United States Fish and Wildlife Service). 1994. Final Environmental Impact Statement: The Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho. US Department of Agriculture, Washington, DC.

_____. 2009. Net Economic Values of Wildlife-Related Recreation in 2006. Report 2006-5. US Department of Agriculture, Washington, DC.

US Census Bureau. 2011. Population Estimates, Intercensal Estimates of the Resident Population for Counties: April 1, 2000 to July 1, 2010. Internet Web site: http://www.census.gov/popest/data/intercensal/county/CO-EST00INT-01.html.

US Department of Commerce. 2012. Bureau of Economic Analysis, Regional Economic Information System, Local Area Personal Income and Employment. Internet Web site: http://www.bea.gov/regional/index.htm.

US Water Resources Council. 1983. Principles and Guidelines for Water and Related Land Resource Implementation Studies. Washington, DC.

Wilson, M., and J. Hoehn. 2006. Valuing Environmental Goods and Services Using Benefit Transfer: The State-of-the-art and Science. Ecological Economics. Special Issue Volume 60.

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Appendix R

Economic Impact Analysis Methodology

APPENDIX R
ECONOMIC IMPACT ANALYSIS METHODOLOGY

INTRODUCTION

This appendix describes the methods and data that underlie the economic impact modeling analysis. Input-output models such as the Impact Analysis for Planning (IMPLAN) model, an economic impact analysis model, provide a quantitative representation of the production relationships between individual economic sectors. Thus, the economic modeling analysis uses information about physical production quantities and the prices and costs for goods and services. The inputs required to run the IMPLAN model are described in the following narrative and tables. The resulting estimates from the IMPLAN model, by alternative, are in Chapter 4, Environmental Consequences, Section 4.20, Social and Economic Conditions. The first portion of the following information describes general aspects of the IMPLAN model and how it was used to estimate economic impacts. The following section provides additional detailed data used in the analysis for livestock grazing and wind energy development.

THE IMPLAN MODEL

IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the ripple effect (also called the multiplier effect) of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

This analysis used IMPLAN 2011; prior to running the model, cost and price data were converted to a consistent dollar year (2011) using sector-specific

adjustment factors from the IMPLAN model. However, the values in this appendix are expressed in year 2010 dollars for comparison with baseline data.

The current IMPLAN model has 440 economic sectors, of which 198 are represented in the Socioeconomic Study Area counties. This analysis involved direct changes in economic activity for 16 IMPLAN economic sectors, as well as changes in all other related sectors due to the ripple effect. The IMPLAN production coefficients were modified to reflect the interaction of producing sectors in the Primary and Secondary Socioeconomic Study Areas. As a result, the calibrated model does a better job of generating multipliers and the subsequent impacts that reflect the interaction between and among the sectors in the Socioeconomic Study Area compared to a model using unadjusted national coefficients. Key variables used in the IMPLAN model were filled in using data specific to the Socioeconomic Study Area, including employment estimates, labor earnings, and total industry output.

The trade data available in the current version of IMPLAN (Version 3.0) make it possible to do multi-region analysis to track how an impact on any of the IMPLAN sectors in the study area affects production in any of the sectors in any other region of the US. For this analysis, this feature allowed the estimation of how an impact in the primary study area disperses into the secondary study area, and how these effects in the secondary study area create additional local effects in the primary study area. As a result, it was possible to estimate not only the jobs and income generation in the primary study area, but to also estimate how the economic activity in the primary study area affected jobs and income generation in the secondary study area.

LIVESTOCK GRAZING

Economic impacts from changes to livestock grazing are a function of the amount of forage available and the economic value of forage.

Forage availability was measured in Animal Unit Months (AUMs), with one AUM defined as the amount of forage needed to feed one cow, one horse, or five sheep for one month. Data on forage availability were obtained from BLM's Rangeland Administration System (BLM 2012). Two types of AUM measures were used: Active AUMs and Billed AUMs. Active AUMs measure the amount of forage from land available for grazing. Billed AUMs measure the amount of forage for which BLM bills annually (i.e., the amount of forage that ranchers actually use, which is typically less than the amount of forage available). Data for 2011 were used for active AUMs. Because billed AUMs fluctuate considerably from one year to another, data for 2000 to 2011 were used to develop a 12-year average for billed AUMs.

Forage availability was estimated for all alternatives (BLM 2013a). Alternatives A, B, and E used the current data for active AUMs (obtained as explained above) in PPMA and PGMA. The analysis estimated 924,617 total active AUMs in GRSG habitat in the Socioeconomic Study Area (BLM 2013a). As under current

management, some acres (178,766) in GRSG would be closed for grazing under Alternatives A, B, and E. Alternative C removed 100 percent of active AUMs in GRSG habitat (PPMA and PGMA). Alternative D discounted the current data to remove all Research Natural Areas (RNAs) with at least 20 percent of PPMA acres and 50 percent of PGMA acres. Closures to these areas would be voluntary or by termination. Alternative F assumed that 25 percent of the acreage in GRSG habitat would be rested each year and not available for grazing. In addition, Alternative F assumed a target utilization of only 25 percent of the non-rested acreage in GRSG habitat. This target utilization would be attempted by setting active AUMs at 50 percent of the non-rested acreage in GRSG habitat. This would result in the targeted 25 percent utilization of the non-rested area, if livestock operatiors follow NRCS stocking rate guides (that typically result in 50 percent use of the authorized area). Therefore, under Alternative F, active AUMs were set at 0.75 x 0.5 = 37.5 percent of the active AUMs under current management. The analysis estimated that of the 924,617 total active AUMs in GRSG habitat (PPMA and PGMA) in the Socioeconomic Study Area, 93,885 would be in the Andrews Field Office (FO) area, 35,861 in the Baker FO area, 52,555 in the Central Oregon FO area, 19,307 in the Deschutes FO area, 402,788 in the Jordan FO and Malheur FO area, 162,227 in the Lakeview FO area, and 157,994 in the Three Rivers FO area. This information was used to calculate the total active AUMs that would be available for grazing under each alternative in GRSG habitat. The results of these calculations are presented in **Table R-1**, Estimated Active Annual Animal Unit Months by Alternative, below.

Table R-2, Estimated Billed Annual Animal Unit Months by Alternative, Primary Socioeconomic Study Area, shows two scenarios for the number of billed AUMs under each alternative. For the high impact scenario, the analysis assumed that livestock operators would choose to maintain a constant ratio of active to billed AUMs so any reduction to active AUMs would result in a proportional reduction to billed AUMs. The analysis applied the current ratio of active to billed AUMs to the calculated number of reduced active AUMs under each alternative to calculate the corresponding number of reduced billed AUMs under each alternative. For the low impact scenario, livestock operators would continue to bill AUMs at the observed level as long as there is enough active AUMs to do so. In other words, the stocking rate would increase if necessary to keep billed AUMs constant. If active AUMs were not reduced beyond the initial amount of billed AUMs, livestock operators would continue to bill the same amount of AUMs, resulting in no impact. If active AUMs were reduced beyond the initial amount of billed AUMs, ranchers would use all of the reduced active AUMs. Thus, when the number of reduced active AUMs was less than number of the initial billed AUMs, the analysis used the number of reduced active AUMs as the number of reduced billed AUMs under each alternative. Otherwise, the analysis assumed no change in the number of billed AUMs.

Table R-1
Estimated Active Annual Animal Unit Months for Allotments in GRSG Habitat by Alternative

Field Office	Initial	Alternatives A, B, and E	Alternative C	Alternative D	Alternative F
Andrews	93,885	93,885	0	93,852	35,207
Baker	35,861	35,861	0	35,842	13,448
Central Oregon	52,555	52,555	0	52,555	19,708
Deschutes	19,307	19,307	0	19,307	7,240
Jordan and Malheur	402,788	402,788	0	399,728	151,046
Lakeview	162,227	162,227	0	156,587	60,835
Three Rivers	157,994	157,994	0	157,753	59,248
Socioeconomic Study Area	924,617	924,617	0	915,624	346,731

Sources: Calculated based on data from BLM 2013a.

Table R-2
Estimated Billed Annual Animal Unit Months in GRSG Habitat by Alternative

Agency	Initial	Alternatives A, B, E	Alternative C	Alternative D	Alternative F
High Impact Scenario					
Andrews	70,361	70,361	0	70,336	26,385
Baker	32,185	32,185	0	32,168	12,069
Central Oregon	30,034	30,034	0	30,034	11,263
Deschutes	10,405	10,405	0	10,405	3,902
Jordan and Malheur	327,308	327,308	0	324,821	122,740
Lakeview	112,436	112,436	0	108,527	42,163
Three Rivers	116,452	116,452	0	116,275	43,670
Socioeconomic Study Area	699,180	699,180	0	692,565	262,193
Low Impact Scenario					
Andrews	70,361	70,361	0	70,361	35,207
Baker	32,185	32,185	0	32,185	13,448
Central Oregon	30,034	30,034	0	30,034	19,708
Deschutes	10,405	10,405	0	10,405	7,240
Jordan and Malheur	327,308	327,308	0	327,308	151,046
Lakeview	112,436	112,436	0	112,436	60,835
Three Rivers	116,452	116,452	0	116,452	59,248
Socioeconomic Study Area	699,180	699,180	0	699,180	346,731

Sources: Calculated based on data from BLM 2013a.

Table R-2, Estimated Reduction in Annual Animal Unit Months by Alternative and Livestock Type, shows the two scenarios for resulting AUM reductions, calculated as the difference between the initial billed AUMs and the reduced billed AUMs under each alternative. AUMs are distinguished between those

allocated to sheep and those allocated to cattle and other animals, to allow different valuation of forage, as explained further below[1].

Table R-3, Estimated Reduction in Annual Animal Unit Months by Alternative and Livestock Type, shows the two scenarios for resulting AUM reductions, calculated as the difference between the initial billed AUMs and the reduced billed AUMs under each alternative. AUMs are distinguished between those allocated to sheep and those allocated to cattle and other animals to allow different valuation of forage, as explained further below.

Table R-3
Estimated Reduction in Annual Animal Unit Months by Alternative and Livestock Type

	High Impact Scenario				Low Impact Scenario			
Agency	**Alts. A, B, E**	**Alt. C**	**Alt. D**	**Alt. F**	**Alts. A, B, E**	**Alt. C**	**Alt. D**	**Alt. F**
				Total				
Andrews	0	-70,361	-25	-43,975	0	-70,361	0	-35,154
Baker	0	-32,185	-17	-20,116	0	-32,185	0	-18,737
Central Oregon	0	-30,034	0	-18,772	0	-30,034	0	-10,326
Deschutes	0	-10,405	0	-6,503	0	-10,405	0	-3,164
Jordan and Malheur	0	-327,308	-2,487	-204,567	0	-327,308	0	-176,262
Lakeview	0	-112,436	-3,909	-70,272	0	-112,436	0	-51,601
Three Rivers	0	-116,452	-178	-72,783	0	-116,452	0	-57,205
Socioeconomic Study Area	0	-699,180	-6,615	-436,988	0	-699,180	0	-352,449
				Cattle and Other				
Andrews	0	-70,341	-25	-43,963	0	-70,341	0	-35,144
Baker	0	-31,957	-17	-19,973	0	-31,957	0	-18,604
Central Oregon	0	-29,410	0	-18,381	0	-29,410	0	-10,112
Deschutes	0	-10,405	0	-6,503	0	-10,405	0	-3,164
Jordan and Malheur	0	-323,226	-2,456	-202,016	0	-323,226	0	-174,064
Lakeview	0	-112,435	-3,909	-70,272	0	-112,435	0	-51,600
Three Rivers	0	-116,362	-177	-72,726	0	-116,362	0	-57,160
Socioeconomic Study Area	0	-694,135	-6,584	-433,834	0	-694,135	0	-349,849
				Sheep				
Andrews	0	-21	0	-13	0	-21	0	-10
Baker	0	-228	0	-143	0	-228	0	-133
Central Oregon	0	-625	0	-391	0	-625	0	-215

[1] Note that if livestock operators followed the NRCS stocking rate guides and utilization were 50 percent of active AUMs under all alternatives, the impacts of the action alternatives would tend to be reduced, given that utilization under current management would actually be less than observed,

Table R-3
Estimated Reduction in Annual Animal Unit Months by Alternative and Livestock Type

Agency	High Impact Scenario				Low Impact Scenario			
	Alts. A, B, E	Alt. C	Alt. D	Alt. F	Alts. A, B, E	Alt. C	Alt. D	Alt. F
				Total				
Deschutes	0	0	0	0	0	0	0	0
Jordan and Malheur	0	-4,082	-31	-2,551	0	-4,082	0	-2,198
Lakeview	0	0	0	0	0	0	0	0
Three Rivers	0	-91	0	-57	0	-91	0	-45
Socioeconomic Study Area	0	-5,046	-31	-3,154	0	-5,046	0	-2,601

Sources: Calculated based on data from BLM 2012 and BLM 2013a.

The economic value of forage is estimated based on the value of production associated with the forage. Values for cattle and sheep are estimated separately, with the value of forage for other animals considered equivalent to the value for cattle. Due to price fluctuations, average per-AUM values for cattle and sheep are based on the 2002 to 2011 average value of production estimates from the (US Department of Agriculture, Economic Research Service 2012). The value for cattle is $50.37 per AUM in the Primary Socioeconomic Study Area, and the value for sheep is $57.20 per AUM in the Primary Socioeconomic Study Area (in 2010 dollars). Including indirect and induced impacts, the value of one AUM in the Primary Socioeconomic Study Area is $96.18 for cattle and is $119.39 for sheep (in 2010 dollars). **Table R-4**, Assumptions for Analysis of Impacts on Output for Livestock Grazing, shows the economic impact assumptions for cattle and sheep. The direct economic impact is the estimated change in livestock output per AUM; IMPLAN generates the indirect and induced impacts.

Table R-5, Assumptions for Analysis of Employment Impacts for Livestock Grazing, provides a summary of the employment impacts that would result, according to IMPLAN, based on unit changes in livestock AUMs.

Table R-4
Assumptions for Analysis of Impacts on Output for Livestock Grazing

Economic Impact	Cattle	Sheep
Primary Study Area		
Direct Economic Impact ($/AUM)	$50.37	$57.20
Indirect Economic Impact ($/AUM)[1]	$40.67	$54.24
Induced Economic Impact ($/AUM)[2]	$5.14	$7.95
Total Economic Impact ($/AUM)	$96.18	$119.39
Multiplier (Total Impact/Direct Impact)	1.91	2.09
Primary and Secondary Study Area		
Direct Economic Impact ($/AUM)	$50.37	$57.20
Indirect Economic Impact ($/AUM)[1]	$41.76	$55.90

Table R-4
Assumptions for Analysis of Impacts on Output for Livestock Grazing

Economic Impact	Cattle	Sheep
Induced Economic Impact ($/AUM)[2]	$5.69	$8.77
Total Economic Impact ($/AUM)	$97.82	$121.87
Multiplier (Total Impact/Direct Impact)	1.94	2.13

Note: All dollar values are in 2010 dollars.
[1] Indirect impacts reflect increased demand in sectors that directly or indirectly provide supplies to the livestock industry.
[2] Induced impacts reflect increased demand in the consumer and government sectors.

Table R-5
Assumptions for Analysis of Employment Impacts for Livestock Grazing

Employment Impact	Cattle	Sheep
Primary Study Area		
Direct Employment (Jobs/1,000 AUMs)	0.000559	0.000980
Indirect Employment (Jobs/1,000 AUMs)	0.000445	0.000957
Induced Employment (Jobs/1,000 AUMs)	0.000051	0.000075
Total Employment (Jobs/1,000 AUMs)	0.001055	0.002013
Multiplier (Total Impact/Direct Impact)	1.89	2.05
Average Earnings per Job (2010 dollars)	$31,791	$17,530
Primary and Secondary Study Area		
Direct Employment (Jobs/1,000 AUMs)	0.000559	0.000980
Indirect Employment (Jobs/1,000 AUMs)	0.000461	0.000980
Induced Employment (Jobs/1,000 AUMs)	0.000056	0.000081
Total Employment (Jobs/1,000 AUMs)	0.001076	0.002042
Multiplier (Total Impact/Direct Impact)	1.93	2.08
Average Earnings per Job (2010 dollars)	$31,767	$17,730

Note: Direct, indirect, and induced employment impacts and average earnings per job are calculated using IMPLAN.

WIND ENERGY

The economic impact of wind energy depends on the expenditures made with installation and operations of wind farms. Expenditures made in the Primary Study Area were estimated based on the amount of electricity (nameplate capacity in megawatts, MW) projected under each alternative, and the installation and operations costs per MW.

Although there are many locations in the study area where wind development is feasible, these locations may or may not overlap with sage-grouse habitat. For the purposes of IMPLAN analysis, BLM considered that two currently existing applications for wind development in the Burns District would no longer occur under Alternatives B, C, and F, both projects being in PGMA, with some of the associated transmission lines and access roads in PPMA. These two projects are estimated to have, when completed, 182 MW of installed capacity. For the

purposes of IMPLAN analysis only, BLM assumed that construction would be distributed over a 10-year period.

Installation and operation costs per MW were obtained from default values for the State of Oregon used by the JEDI (Jobs and Economic Development Impact) model. The JEDI model for wind energy was developed by the National Renewable Energy Laboratory, and default values for construction and operation costs per MW were determined based on extensive interviews with power generation project developers, state tax representatives, and others in the appropriate industries (NREL 2012). Default values were based on projects of 100 MW (50 turbines of 2,000 kilowatts each) and were estimated to be, in 2008 dollars, $2,000 per kilowatt for installed project costs and $20 per kilowatt for operations and maintenance costs.

Tables R-6 and R-7 below show the estimated multipliers for output and employment during installation and operations.

Table R-6
Assumptions for Analysis of Impacts on Output for Wind Energy

Economic Impact	Primary Study Area	Primary and Secondary Study Area
Installation		
Direct Economic Impact ($/MW)	$299,358	$299,358
Indirect Economic Impact ($/MW)[1]	$40,823	$46,811
Induced Economic Impact ($/MW)[2]	$41,212	$44,476
Total Economic Impact ($/MW)	$381,393	$390,645
Multiplier (Total Impact/Direct Impact)	1.27	1.30
Operations		
Direct Economic Impact ($/MW)	$11,727	$11,727
Indirect Economic Impact ($/MW)[1]	$276	$311
Induced Economic Impact ($/MW)[2]	$3,260	$3,433
Total Economic Impact ($/MW)	$15,263	$15,471
Multiplier (Total Impact/Direct Impact)	1.30	1.32

Source: IMPLAN. Note: All dollar values are in 2010 dollars.
[1] Indirect impacts reflect increased demand in sectors that directly or indirectly provide supplies to the installation and operations of wind farms.
[2] Induced impacts reflect increased demand in the consumer and government sectors.

Table R-7
Assumptions for Analysis of Impacts on Employment for Wind Energy

Employment Impact	Primary Study Area	Primary and Secondary Study Area
Installation		
Direct Employment (jobs/MW)	1.69	1.69
Indirect Employment (jobs/MW)	0.28	0.28
Induced Employment (jobs/MW)	0.40	0.43
Total Employment Impact (jobs/MW)	2.37	2.43
Multiplier (Total Impact/Direct Impact)	1.40	1.44
Average Earnings per Job (2010 dollars)	$44,577	$44,514
Operations		
Direct Employment (jobs/MW)	0.15	0.15
Indirect Employment (jobs/MW)	<0.01	<0.01
Induced Employment (jobs/MW)	0.03	0.03
Total Employment Impact (jobs/MW)	0.19	0.19
Multiplier (Total Impact/Direct Impact)	1.23	1.25
Average Earnings per Job (2010 dollars)	$45,302	$45,164

Source: IMPLAN. Note: All dollar values are in 2010 dollars.
[1] Indirect impacts reflect increased demand in sectors that directly or indirectly provide supplies to the installation and operations of wind farms.
[2] Induced impacts reflect increased demand in the consumer and government sectors.

REFERENCES

BLM (United States Department of the Interior, Bureau of Land Management). 2012. Data from BLM Rangeland Administration System.

BLM (United States Department of the Interior, Bureau of Land Management). 2013a. Livestock Grazing Data. Data provided in personal communication from Jeanne DeBenedetti Keyes, GIS Specialist BLM, Oregon State Office. September 2013.

NREL (National Renewable Energy Laboratory). 2012. Methodology. JEDI, Jobs and Economic Development Impact Models. Internet Web site: http://www.nrel.gov/analysis/jedi/methodology.html

US Department of Agriculture, Economic Research Service. 2012. Commodity Costs and Returns. Internet Web site: http://www.ers.usda.gov/data-products/commodity-costs-and-returns.aspx. Accessed in August 2012.

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